Bibliometrics of social media research: A co-citation and co-word analysis

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ABSTRACT

This study combined two bibliometric analysis methods to provide a systematic and holistic review of social media-related academic literature. A total of 406 publications related to social media between 2007 and 2016 were identified from 16 business and hospitality/tourism journals. Co-citation analysis identified Word-of-Mouth as the major theoretical foundation of social media research in business, while the hospitality/tourism field presented a diverse theoretical foundation. The study then employed co-word analysis to identify the evolution of research themes over time in both fields. The comparison of social media research between the two fields highlighted four similarities, including the growth of research over time, the term "social media" gaining popularity, the new trend of social networking sites, and managerial applications as research focus. Finally, the study called for a future research agenda on social media research in the hospitality/tourism field.

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1. Introduction

Coined in the late 1990s, "social media" have become ubiquitous nowadays with over 2 billion active users worldwide (Number, 2016). By definition, social media are computer-mediated technologies that facilitate the creation and sharing of information, ideas, and other forms of expression via virtual communities and networks (Obar and Wildman, 2015). Social media connect everybody in previously unimaginable ways and thus have transformed communication between businesses and customers (Kietzmann et al., 2011).

The hospitality and tourism industry relies heavily on word of mouth among customers, which has grown exponentially on social media. Social media play an increasingly important role in customer information search and decision-making behaviors (Fotis et al., 2012). Advantages of social media include its global reach, immediacy, easy accessibility, and versatility for interactive exchanges (Khan, 2012). Moreover, social media also allow hospitality and tourism companies to engage online customers, improve online presence, and generate online revenues (Leung et al., 2013). Thus,

it has become a business imperative for hospitality and tourism companies to embrace social media.

With the increasing importance of social media, a plethora of research on the application of social media in hospitality and tourism has emerged in the last decade (Leung et al., 2013; Zeng and Gerritsen, 2014). As a relatively new phenomenon, it is beneficial for academic scholars to regularly review prior relevant research so as to gain an overall view of the intellectual structure of this field and to predict how the field might move forward (De Bakker et al., 2005; Line and Runyan, 2012). Due to the qualitative and subjective nature of the previous literature review studies on social media in hospitality and tourism (Leung et al., 2013; Zeng and Gerritsen, 2014), quantitative research of literature review will facilitate deeper insight into this area and reveal the focus of previous studies over the years and the relationships among them (Muñoz-Leiva et al., 2015).

Bibliometrics is a form of statistical analysis of publications that provides quantitative insight into academic literature (Benckendorff and Zehrer, 2013; De Bellis, 2009). Bibliometric analysis provides insight into the growth of literature and the flow of knowledge within a specified field over a period of time by analyzing information gathered in the database, such as citations, authors, keywords, or the range of journals consulted (Van Raan, 2005). Based on which information it uses in analysis, bibliometrics includes different methods, such as citation analysis,

co-citation analysis, and bibliographic coupling using citations (De Bellis, 2009), and co-word analysis using keywords (He, 1999).

With the help of bibliometrics, the present study aims to fulfill a research gap by carrying out a systematic and quantitative analysis of social media literature in top business journals and hospitality and tourism journals. The study applies a bibliometric approach combining co-citation analysis with co-word analysis to reveal and visualize the big picture and evolution of this research area. Specifically, this study intends to achieve the following objectives: 1) to explore the overall theoretical foundation of social media research in both the business and hospitality/tourism fields using co-citation analysis; 2) to identify the research themes and thematic evolution of social media research in both the business and hospitality/tourism fields over a ten-year period by co-word analysis; 3) to reveal similarities and differences in social media research between the two fields; and 4) to suggest directions for future social media research in the hospitality/tourism field.

2. Literature review

2.1. Social media review research

The emergence of social media has changed consumer consumption habits of looking for, assessing, choosing, and buying products and services (Albors et al., 2008). Thus, marketers have been presented with new challenges and difficulties in marketing strategies, practices, and tactics in the social media era (Thomas, 2007). Two literature review articles summarized the research focuses of social media research in the business field. Alves et al. (2016) analyzed 44 articles on social media marketing published between 2010 and 2015 and identified two distinct research perspectives; whereas some considered consumers' perspectives of usage, share, and decision making, other examined companies' perspectives of implementation, optimization, and measurement of results. Knoll (2016) reviewed 51 academic papers on the topic of social media advertising and described seven emerging themes: usage, attitudes, targeting, user-generated content, electronic word-of-mouth, consumer-generated advertising, and further advertising effects. In relation to social media, researchers also conducted literature reviews on electronic word of mouth (eWOM). To compare eWOM with WOM and provide marketers with best practice suggestions, Barreto (2014) evaluated 88 papers and books on the topic of WOM and eWOM published between 1955 and 2011. Similarly, Mishra and Satish (2016) systematically examined all eWOM articles in the last 10 years of publication and proposed theoretical foundations of eWOM research from the social, information, and marketing fields. In the hospitality and tourism fields, Chen and Law (2016) evaluated 43 articles on the topic of eWOM from 2008 to 2013 and identified the three dimensions of eWOM research as the characteristics, antecedents, and impacts.

Two extensive literature reviews have examined social media research in the hospitality and tourism fields. Leung et al. (2013) reviewed 44 social media-related articles published in the hospitality and tourism fields between 2007 and 2011. Their study indicated that social media research generally paid more attention to suppliers' applications, including promotion, management, and research functions. From the consumer point of view, the majority of research have been focused on the use and impact of social media on the travel planning process (Leung et al., 2013). To update Leung et al.'s (2013) research, Zeng and Gerritsen (2014) applied bibliometric analysis to examine 279 publications regarding social media in tourism published from 2007 to 2013. In line with Leung et al.'s (2013) findings, Zeng and Gerritsen (2014) stated that social media-related studies mainly focused on topics such as marketing,

management, tourist behaviors, and information creation and sharing. They also indicated that research on social media in tourism is still in its infancy.

2.2. Bibliometric analysis

The term bibliometrics was first introduced by Pritchard (1969) as "the application of mathematical and statistical methods to books and other means of communication" (p. 349). Bibliometrics use quantitative analysis of empirical data in published literature to study the patterns of publication within a field (De Bellis, 2009). Thus, the use of bibliometrics enables researchers to examine the body of literature in their area of study in order to identify major themes (Grant et al., 2000; Vogel and Güttel, 2013). Bibliometric analysis is often combined with science mapping techniques to visualize the intellectual structure of a particular research field (Cobo et al., 2011). Bibliometrics consist of various analysis methods depending on different types of information used in the analyses (Van Raan, 2005). The most common ones are citation-based analysis, co-word analysis or keyword co-occurrence analysis, and co-authorship analysis (Van Eck and Waltman, 2014). Within citation-based analysis, a further classification includes citation analysis, co-citation analysis, and bibliographic coupling (Van Eck and Waltman, 2014).

Co-citation analysis is the most commonly used bibliometric analysis method (Ding et al., 2001). Co-citation is defined as two publications which are cited together in one article (Small, 1973). When two publications are frequently co-cited by the other articles, it is very likely that these two references have something in common (Benckendorff and Zehrer, 2013). As an advanced bibliographic technique (Köseoglu et al., 2015), co-citation analysis is used to discover the clusters of co-citation pairs, which enable scholars to obtain insights for the cumulative tradition, knowledge base, and intellectual structure of scientific research (Small, 1978; Culnan, 1986; Pasadeos et al., 1998).

Although co-citation analysis has been claimed to be superior in displaying disciplinary structures to other bibliometric methods (Bichteler and Eaton, 1980; Chang et al., 2015), it is not able to provide a content picture of the research topics dealt with in the literature. Co-word analysis, on the other hand, was developed to address this kind of analytical problem (Callon et al., 1991). Co-word analysis is based on the frequency of co-occurrence of keywords, that is, the number of papers in which two keywords appear together (Whittaker, 1989). By measuring the strengths of the keyword co-occurrence links, co-word analysis reveals and visualizes the interactions between keywords (Callon et al., 1991; Su and Lee, 2010). Since keywords are the terms used to verbalize the core of a research article, co-word analysis is often used to explore the concept network of research topics and trends in a specific discipline (Callon et al., 1991; Ding et al., 2001). However, co-word analysis also has its weakness in stability due to term changes over time (Leydesdorff, 1997; Åström, 2002).

Since different bibliometric analysis methods all have strengths and weaknesses, combining various methods to explore research trends in a certain discipline has become a trend in bibliometrics (Chang et al., 2015). Previous studies using a combination of co-citation and co-word analyses indicated complimentary roles of the two analyses (Braam et al., 1991a,b). After employing both co-citation analysis and co-word analysis in a literature review study, Åström, 2002 also indicated that the overlap of the two methods was relatively small and the combination of the two methods provided better results. Similarly, Chang et al. (2015) suggested combining co-citation analysis with keyword analysis could not only create a comprehensive map of the intellectual structure of

a certain discipline, but facilitate a deeper understanding of its development as well.

2.3. Bibliometrics in hospitality and tourism

Bibliometric analysis has been widely used in literature reviews on a broad range of topics in the business discipline, including marketing (Samiee and Chabowski, 2012), advertising (Kim and McMillan, 2008), sales management (Johnson, 2006), accounting (Zhong et al., 2016), strategic management (Vogel and Güttel, 2013), supply chain management (Asgari et al., 2016), and so on.

In the hospitality and tourism fields, Palmer et al. (2005) were the first authors who employed keyword analysis in reviewing the use of statistical methods in tourism research. However, bibliometric analysis, especially co-citation analysis, has not been widely used until the recently. Benckendorff and Zehrer (2013) discussed the epistemology of tourism research and its interdisciplinary structure based on 15-years of tourism research using co-citation analysis. Similarly, García-Lillo et al. (2016) employed co-citation analysis to explore the intellectual structure of research on hospitality management from all papers published in *International Journal of Hospitality Management* between 2008 and 2014. Yuan et al. (2016) used citation analysis to investigate the overall knowledge bases and flows of six leading hospitality and tourism journals to explore the structure of the hospitality and tourism disciplines.

More scholars appear to be interested in using bibliometric analysis on specific topics within the hospitality and tourism fields. For example, Yankholmes (2014) analyzed the state-of-the-art practices of African scholars in hospitality and tourism research over a 20-year period using co-citation analysis. Chuang et al. (2014) used main path analysis to identify development trajectories and recent active research areas in medical tourism. Figueroa-Domecq et al. (2015) categorized the prevailing themes and methodologies in gender-aware tourism research for 28 years based on co-citation analysis. Gomezelj (2016) also used co-citation analysis to identify the state of research on innovation in hospitality and tourism through a systematic review of the literature. Cheng (2016) summarized the theoretical foundations and key themes underlying sharing economy between 2010 and 2015 using co-citation analysis.

With the exponential growth of social media research in hospitality and tourism in recent years (Zeng and Gerritsen, 2014), it is crucial to update prior literature review studies and revisit the theoretical foundation, thematic evolution, and future directions of social media research. At the same time, a comparative and quantitative analysis of the business and hospitality/tourism journals will provide more insight for scholars in both fields. Therefore, using bibliometric analysis, this study covers a longer publication period and targets specific business and hospitality/tourism journals in an attempt to fill this research gap. As previous studies suggested (Braam et al., 1991a,b), a combination of co-citation analysis with co-word analysis offers a probability to improve the capability to examine both intellectual structure and dynamics of a research field. Thus, in this study, citation and co-citation analysis are used to reveal the state of art and theoretical foundation of this research area, while keyword and co-word analysis are employed to explore the research themes and thematic evolution of this research area.

3. Methodology

3.1. Data collection

The study collected bibliographic data from the Social Sciences Citation Index by accessing the Web of Science bibliographic database produced by Thomson Reuters. This study selected 16 journals from the database, consisting of eight top business journals and eight top hospitality/tourism journals. Combining results of several business journal ranking studies (Fei and Bell, 2013; Steward and Lewis, 2010; Theuβ et al., 2014), this study selected the eight top business journals as *Journal of Advertising* (JA), *Journal of the Academy of Marketing Science* (JAMS), *Journal of Advertising Research* (JAR), *Journal of Consumer Research* (JCR), *Journal of Marketing* (JM), *Journal of Marketing Research* (JMR), *Journal of Retailing* (JR), and *Marketing Science* (MS). Based on McKercher et al. (2006) and Gursoy and Sandstrom's (2016) hospitality and tourism journal- ranking studies, the eight top hospitality/tourism journals included *Annals of Tourism Research* (ATR), *Cornell Hospitality Quarterly* (CHQ), *International Journal of Contemporary Hospitality Management* (IJCHM), *International Journal of Hospitality Management* (IJHM), *Journal of Hospitality & Tourism Research* (JHTR), *Journal of Travel Research* (JTR), *Journal of Travel & Tourism Marketing* (JTTM), and *Tourism Management* (TM).

Based on existing studies on social media (Alves et al., 2016; Knoll, 2016; Leung et al., 2013; Zeng and Gerritsen, 2014), a list of 28 social media-related keywords was generated for the initial article search in the database, including "social media," "social networking," "SNS," "Web 2.0," "UGC," "user generated content," "user-generated content," "tourist-generated content," "electronic word-of-mouth," "eWOM," "blog," "online community," "online communities," "customer review," "online review," "co-creation," "sharing economy," "big data," "Internet forum," "Facebook," "YouTube," "Twitter," "LinkedIn," "Instagram," "Pinterest," "Myspace," "TripAdvisor," and "Expedia." These words were used in searching the titles, keywords, and abstracts of the publications within the 16 selected journals. Since both Leung et al.'s (2013) and Zeng and Gerritsen's (2014) social media review studies identified the first social media research in the hospitality/tourism field as having appeared in 2007, the study examined articles that were published between 2007 and 2016. Only research articles were included in the study sample, with other types of publications such as discussion notes, comments, and announcements excluded. The preliminary search returned 903 academic articles. The titles and abstracts of all the articles identified in the initial search were carefully reviewed for relevancy to social media, and irrelevant articles were deleted from the sample. As a result, a total number of 406 research papers were retained as social media related articles (Table 1). The fluctuation of the numbers of social media-related publications in both business and hospitality/tourism journals over the study period is shown in Fig. 1.

3.2. Data analysis

Before data analysis, the sample file was converted to a Microsoft Word File for data cleaning. By screening the Word file, the authors first manually removed coding errors in the cited references. For example, two different forms of the same author's name, such as "Duan W" and "Duan WJ," represented the same author and were corrected in data cleaning. Keywords were extracted from the author-supplied keyword list of a publication. Due to the fact that authors may use different keywords to describe the same concept, all keywords were standardized in order to make them consistent (singular/plural) and unified (synonyms). For example, user generated content, user-generated content, and UGC were all standardized to UGC. After data cleaning, a coding standard was created to ensure coding accuracy.

The data analysis of this study consisted of three steps. First, descriptive statistics were presented to show the overall citation analysis results. Bibexcel was used to conduct frequency counts of citations and cited journals. Second, co-citation networks were mapped for both the business field and the hospitality/tourism

Table 1
Number of selected articles in each journal.

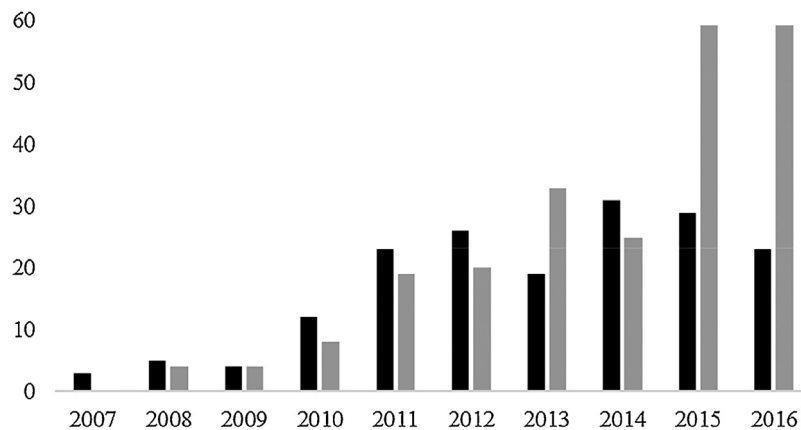| Journal	Number of Articles
Business	175
Journal of Advertising (JA)	9
Journal of the Academy of Marketing Science (JAMS)	6
Journal of Advertising Research (JAR)	42
Journal of Consumer Research (JCR)	17
Journal of Marketing (JM)	18
Journal of Marketing Research (JMR)	32
Journal of Retailing (JR)	14
Marketing Science (MS)	37
Hospitality/tourism	231
Annals of Tourism Research (ATR)	14
Cornell Hospitality Quarterly (CHQ)	17
International Journal of Contemporary Hospitality Management (IJCHM)	27
International Journal of Hospitality Management (IJHM)	44
Journal of Hospitality & Tourism Research (JHTR)	8
Journal of Travel Research (JTR)	18
Journal of Travel & Tourism Marketing (JTTM)	43
Tourism Management (TM)	60
Total	406

Fig. 1. Number of articles change over time.

field, and clusters were identified to explore the theoretical foundation of social media research. In this step, co-citation network data was prepared by Bibexcel and duplicate records or papers without citations were eliminated (Persson, 2010). Pajek software was used for decomposing the networks, while VOSviewer was subsequently employed to construct and visualize bibliometric networks (Waltman et al., 2010). Lastly, to examine the evolution of research topics and themes over time, the whole study period was broken into two sub-periods: 2007–2011 and 2012–2016. Keywords of all the selected articles were categorized using content analysis to identify the research trends. Similar to the previous step, Bibexcel, Pajek, and VOSviewer were again employed to map co-word networks for each sub-period to explore research patterns in both the business and hospitality/tourism fields.

4. Results

4.1. Citation analysis

Overall, a total of 175 social media related articles in the business field produced 9242 citations, covering 6641 different publications. For the hospitality/tourism field, the 231 social media related articles generated a dataset of 15,068 citations with 10,212 different publications. The 20 most frequently cited journals in both fields are summarized in Table 2.

In the business field, the top 20 most frequently cited journals accounted for 42.8% of total citations. The most cited journal in the business field was *Journal of Consumer Research*, followed by *Journal of Marketing Research and Marketing Science*. It is important to note that the top 4 most cited journals were all among the study-selected eight top business journals, thus indicating a self-citation bias that may inflate the number of citations for these journals (Benckendorff and Zehrer, 2013). Within the hospitality/tourism field, the top 20 most frequently cited journals formed 35.7% of the total citations. The most cited journal in the hospitality/tourism field was *Tourism Management*, accounting for nearly double the number of citations contained within the second most commonly cited publication, *Journal of Travel Research*. As was the case within the business field, the top 5 most cited journals were all among the study-selected top eight hospitality and tourism journals.

4.2. Co-citation network

Since the study sample had over 20,000 citations, it is impossible to conduct a co-citation analysis of the whole sample set. McCain (1990) suggested that a cutoff point can be established to select the most influential papers. Therefore, the current study selected the citations which had been cited at least 10 times, and thus 51 citations in the business field and 113 citations in the hospitality/tourism field were involved in the co-citation analysis. In order to reveal the structure and theoretical foundations of social

Table 2
Most cited journals in business and hospitality/tourism.

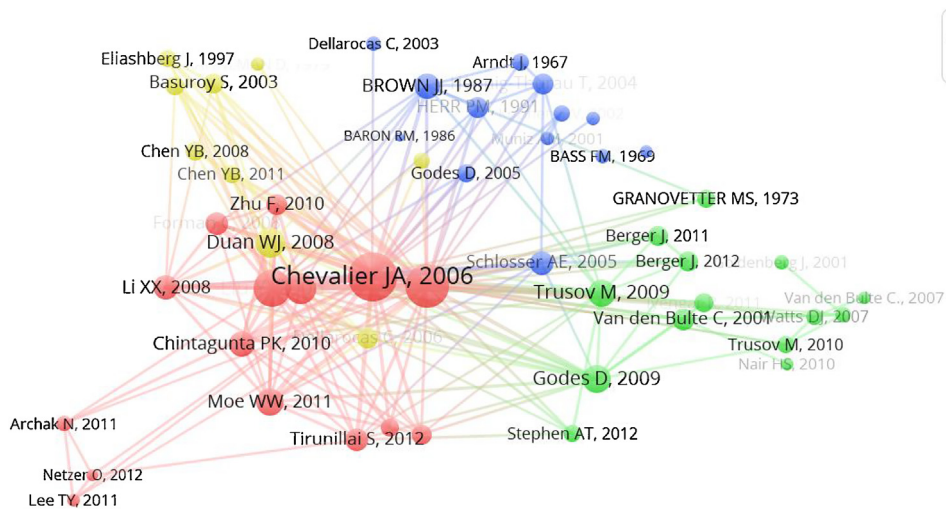| Business		Hospitality/tourism	
Journal	Citations	Journal	Citations
Journal of Consumer Research	652	Tourism Management	979
Journal of Marketing Research	610	Journal of Travel Research	526
Marketing Science	594	International Journal of Hospitality Management	482
Journal of Marketing	444	Annals of Tourism Research	445
Management Science	229	Cornell Hospitality Quarterly	301
Journal of Personality and Social Psychology	193	Journal of Marketing	285
Journal of Advertising Research	181	Journal of Travel & Tourism Marketing	278
Journal of Interactive Marketing	161	Journal of Marketing Research	244
Journal of Retailing	135	Journal of Consumer Research	234
International Journal of Research in Marketing	96	International Journal of Contemporary Hospitality Management	205
Marketing Letters	87	Journal of Interactive Marketing	192
Information Systems Research	84	Computers in Human Behavior	185
Journal of the Academy of Marketing Science	74	Journal of Business Research	179
Econometrica	66	Journal of Hospitality & Tourism Research	145
Journal of Advertising	62	Journal of the Academy of Marketing Science	143
Journal of Consumer Psychology	62	Journal of Vacation Marketing	136
Journal of Business Research	59	Journal of Service Research	116
American Journal of Sociology	58	Journal of Retailing	104
Psychological Bulletin	58	Journal of Personality and Social Psychology	102
Journal of Service Research	53	Management Science	92

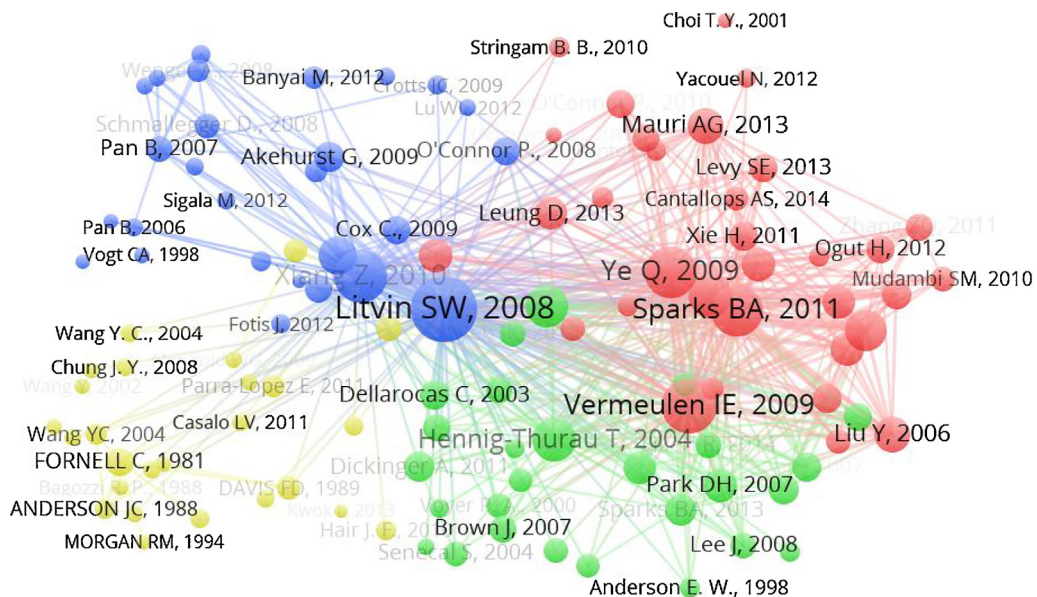**Fig. 2.** Visualized co-citation network in business.

Fig. 3. Visualized co-citation network in hospitality/tourism.

Table 3
Co-citation clusters as pillars of theoretical foundation.

Business		Hospitality/tourism	
Cluster	Representative citations	Cluster	Representative citations
WOM and sales	Chevalier and Mayzlin (2006) Liu (2006)	Online reviews and behavior	Vermeulen and Seegers (2009) Sparks and Browning (2011)
WOM and social media marketing	Trusov et al. (2009) Berger and Milkman (2012)	Online reviews and eWOM	Hennig-Thurau et al. (2004) Papathanassis and Knolle (2011)
WOM and social influence	Brown and Reingen (1987) Schlosser (2005)	Information technology and UGC	Buhalis and Law (2008) Akehurst (2009)
Internet and online WOM	Duan et al. (2008) Dellarocas (2003)	Research methodology	Fornell and Larcker (1981) Hair et al. (2010)

media research, the selected citations were clustered using the smart local moving (SLM) algorithm as the method of cluster analysis (Waltman and Van Eck, 2013). The co-citation networks of the references in business and hospitality/tourism research are visualized in Figs. 2 and 3, respectively. The size of the bubble presents the normalized number of citations received by the articles and the thickness of the lines represents the strength of co-citations ties. The link and proximity between two articles identify the co-citation relationship between the two. The color of the bubble indicates the cluster with which the article is associated. Each bubble was labeled by the first author and publication year of the article.

As shown in Fig. 2, the business co-citation network formed four clusters. The clusters were named based on the majority of references belonging to them. All four clusters were related to one important concept, word of mouth (WOM), indicating that WOM was the major theoretical foundation of social media research in business (Table 3). The first cluster was identified as *WOM and sales*, focusing on the impacts of WOM on sales performance in different industry sectors. The second cluster referred to *WOM and social media marketing*, discussing the differences between traditional marketing and social media marketing. The third cluster presented *WOM and social influence*, emphasizing the application of social ties and social interactions in explaining WOM behavior. The last cluster was defined as *Internet and online WOM*, explaining how the Internet facilitated the change from WOM to online WOM.

Similarly, the hospitality/tourism co-citation network identified four different clusters (Fig. 3, Table 3). The first cluster was named *online reviews and behavior*, which focused on the impacts of online reviews on customers' travel behaviors, decision-making, booking intention, and so on. The second cluster was related to *online reviews and eWOM*, which applied eWOM as the theoretical foundation in studying online reviews. The third cluster was described as *information technology and user generated content (UGC)*, which emphasized the role of information technology on UGC, and the characteristics and impacts of UGC. The last cluster presented *methodology* in social media research, including structural equation modeling, multivariate data analysis, psychometric methods, and so on. Compared to research in business, social media research in hospitality/tourism had a more diverse array of theoretical foundations.

4.3. Keyword analysis and co-word network

In order to explore the changes of research themes in social media research from 2007 to 2016, the ten-year study period was broken into two sub-periods: 2007–2011 and 2012–2016. The study collected all the keywords from the sample articles to conduct keyword and co-word analysis in two steps. First, visualized co-word networks were created to show the relationships among the keywords in each field during each sub-period. Second, to better understand the changes of research interests over time, the study categorized those keywords that appeared multiple times into seven themes. The seven themes of keywords were

identified as Foundation, Platform, Content, Business Sector, Managerial Application, Methodology, and Emerging Trend. The theme of Foundation is related to the definition of social media and the theories supporting social media, such as WOM. The theme of Platform refers to different channels/platforms of social media, such as Twitter. The theme of Content includes different forms/expressions of user generated content on social media, such as online reviews. The theme of Business Sector consists of the industries or business sectors of the study focus, such as hotel. The theme of Managerial Application explains all the managerial applications or implications recommended or suggested in the studies, such as customer relationship management. The theme of Methodology describes methods used in the studies, such as Bayesian estimation. The theme of Emerging Trend reveals the most recent trends of research interests, such as big data, which only showed up in the second period, 2012–2016.

4.3.1. Social media research in business

Between 2007 and 2011, 47 articles were published in eight business journals regarding social media, generating 114 different keywords. Between 2012 and 2016, 128 articles were identified, resulting in 308 unique keywords. Figs. 4 and 5 present the two visualized co-word networks in the two sub-periods. As with co-citation networks, the size of the bubble represents the frequency count of the keywords, while the thickness of the line indicates the strength of the co-occurrence of keywords. Different areas of research focus were discovered and presented in the two figures. In the period of 2007–2011, social media research had two broad areas of focus. One was "social network" based on "internet" and "social influence" theories; and the other was "WOM" leading to "viral marketing" and "internet marketing." In the period of 2012–2016, three areas of research focus emerged. The first two areas remained the same as the first sub-period, with one as "social media" and "social network," and the other as "WOM" and "UGC." The last area of focus was a new trend of "big data" with the use of the "text mining" method.

The categorization of keywords in the business field is shown in Table 4. Social media research keywords were grouped into six themes, with no keywords appearing in the theme of Business Sector, showing that social media research in business did not focus on any specific industry or business sector. Several changes of research themes over time are presented in Table 4. First, there were more keywords and research areas in the second sub-period than in the first, indicating that social media research in business was growing over time. Second, the word "social media" only appeared in the period of 2012–2016, suggesting that the term "social media" was not as popular in research before 2012. Third, in the period of 2007–2011, social media research did not focus on any specific platform or content, while in the period of 2012–2016, Twitter emerged as a specific platform of research and UGC and online customer reviews received plenty of research attention. Lastly, "big data" came into being in the period of 2012–2016 as an emerging trend in social media research.

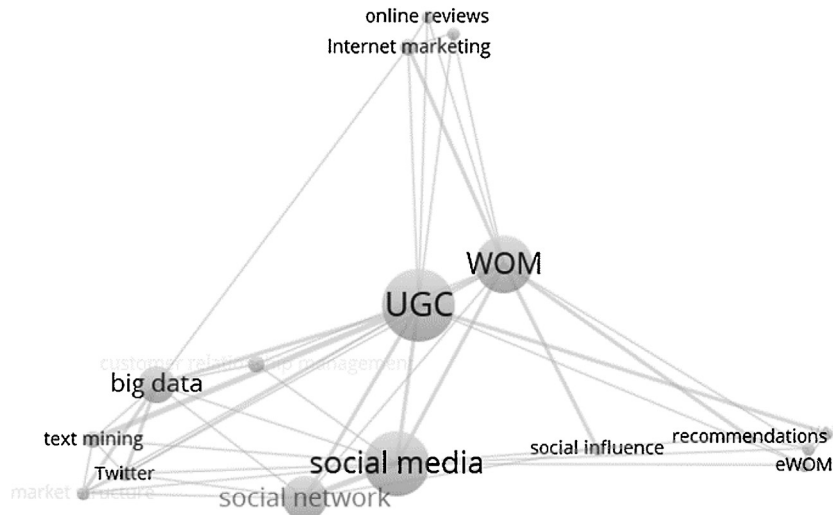**Fig. 4.** Visualized co-word network in business, 2007–2011.

Fig. 5. Visualized co-word network in business, 2012–2016.

Table 4
Social media research thematic evolution in business.

Themes	Keywords (Frequency)	
	2007–2011	2012–2016
Foundation	WOM (9), social network (7), Internet (3), social influence (3), eWOM (2), information exchange (2)	social media (16), WOM (14), social network (11), eWOM (3), social influence (3)
Platform		Twitter (3)
Content		UGC (18), online customer reviews (3), online reviews (3)
Managerial Application	Internet marketing (3), viral marketing (2), information search (2)	Internet marketing (4), customer relationship management (4), advertising (3), market structure (3), recommendations (3)
Methodology	Bayesian estimation (2), hazard models (2), endogeneity (2)	text mining (4), VAR (3)
Emerging Trend		big data (9)

Note: The numbers in parentheses are the frequency counts of keywords.

4.3.2. Social media research in hospitality/tourism

Between 2007 and 2011, only 35 articles were found in eight hospitality and tourism journals regarding social media, producing 133 unique keywords, while in the period of 2012–2016, 196 articles were identified, generating 657 different keywords. The two visualized co-word networks in the two sub-periods display different areas of research interest in this topic (Figs. 6 and 7). In the period of 2007–2011, social media research consisted of three broad areas of interest. The first was "eWOM" research based on "Web 2.0" in the "hotel" industry. The second was "travel" "blog" research leading to tourist "satisfaction." The last was "Internet" based "marketing" and "service recovery." In the period of 2012–2016, three different areas of research interest appeared. The first was the managerial applications of "social media." The second was "eWOM" generated from "online reviews." The last was "content analysis" and "netnography" of "UGC."

Table 5 reveals the categorization of keywords in the hospitality/tourism field and the changes of research themes over time. Firstly, social media research in hospitality/tourism also expanded rapidly, as demonstrated by more keywords or research areas
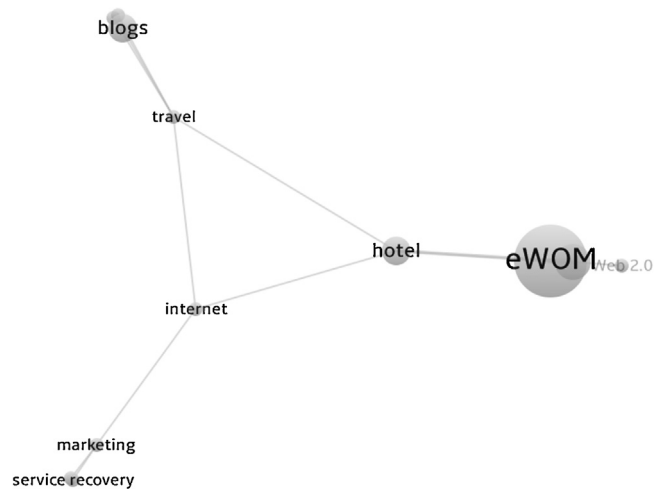

Fig. 6. Visualized co-word network in hospitality/tourism, 2007–2011.

Table 5
Social media research thematic evolution in tourism & hospitality.

Themes	Keywords	
	2007–2011	2012–2016
Foundation	eWOM (10), social media (3), internet (2), WOM (2), Web 2.0 (2)	social media (59), eWOM (32), Web 2.0 (9), WOM (7), social network (5), information technology (3)
Platform	blogs (4), travel blogs (2), online travel community (2)	Facebook (12), SNS (10), travel blogs (6), TripAdvisor (8)
Content	online reviews (5)	online reviews (22), UGC (17), online hotel reviews (4), reviews (4), photography (3), tourist photography (3)
Business Sector	hotel (4), travel (2)	hotel (12), tourism (6), hospitality (4), destination marketing organization (4), hotel industry (3)
Managerial Application	customer satisfaction (2), marketing (2), consumer behavior (2), service recovery (2), satisfaction (2), delight (2)	destination image (7), reputation management (7), trust (7), motivation (6), consumer behavior (5), service failure (4), credibility (4), satisfaction (4), hotel performance (4), human resources (3), communication (3), booking intention (3), brand commitment (3), emotions (3), service recovery (3), customer satisfaction (3), service quality (3), satisfaction assessment (3), value co-creation (3), social media marketing (3)
Methodology		content analysis (14), netnography (7), data mining (4), elaboration likelihood model (3)
Emerging Trend		China (8), Chinese tourists (3)

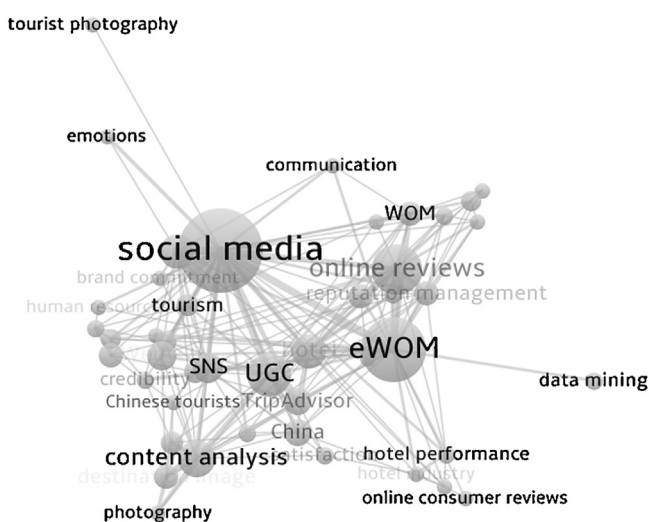*Note:* The numbers in parentheses are the frequency counts of keywords.

Fig. 7. Visualized co-word network in hospitality/tourism, 2012–2016.

appearing in the second sub-period than within the first. Secondly, as was the case within the business field, the term "social media" gained popularity only in the period of 2012–2016. Thirdly, the social media platform of study focus switched from online travel communities in the period of 2007–2011 to Facebook and TripAdvisor in the period of 2012–2016, while blogs continued as a common research focus in the both sub-periods. Fourthly, the social media content of research interest grew from merely online reviews in the first sub-period to various formats of UGC, including reviews and photography, in the second sub-period. Fifthly, in the period of 2012–2016, social media research brought diverse managerial implications to the hospitality/tourism industry, including destination image, reputation management, human resources, communication, brand commitment, value co-creation, and so on. Sixthly, in the first sub-period, social media research did not seem to include any methodological support, while different methodologies were employed in the second sub-period. Lastly, the mention of "China" and "Chinese tourists" became an emerging trend in the period of 2012–2016 in social media research in hospitality/tourism.

4.3.3. Comparison of social media research

The comparison of social media research within business and hospitality/tourism highlighted both similarities and differences.

The first similarity was the growth of social media research over time in both fields. The second similarity was that the term "social media" only became popular more recently, within the period of 2012–2016. The third similarity was that social networking sites (Facebook, Twitter) emerged as a recent study interest in the period of 2012–2016 in both fields. Finally, social media research in both fields paid adequate attention to managerial applications, especially in the areas of marketing and customer management.

On the other hand, multiple differences in social media research in both fields were discovered. First, in terms of social media research foundations, the business field valued WOM while the hospitality/tourism field relied more on eWOM. Second, social media research in hospitality/tourism often targeted a specific tourism or hospitality business sector. However, research in the business field appeared to stay away from any industry focus. Third, social media research in business always involved some form of methodology. However, social media research in hospitality/tourism started with seemingly no methodology and then developed various methods with the increase of research volume. Lastly, social media research in both fields focused on different emerging trends.

5. Discussion and conclusion

The current study applied multiple bibliometric analysis methods (citation, co-citation, keyword, and co-word analyses) to review social media research published in eight top business journals (JA, JAMS, JAR, JCR, JM, JMR, JR, and MS) and eight top hospitality and tourism journals (ATR, CHQ, IJCHM, IJHM, JHTR, JTR, JTTM, and TM) between 2007 and 2016. The theoretical foundations and the thematic evolution of social media research in the both business and hospitality/tourism fields were explored.

Citation analysis results showed that the most cited journal was *Journal of Consumer Research* in the business field and *Tourism Management* in the tourism/hospitality field. The four clusters in co-citation networks were identified as the pillars of theoretical foundation of social media research in both fields. In the business field, WOM was the major theoretical foundation of social media research, which was surrounded by the four clusters. The four clusters were identified as *WOM and sales, WOM and social media marketing, WOM and social influence*, and *Internet and online WOM*. On the other side, the hospitality/tourism field presented an array of theoretical foundations. The four clusters were identified as *online reviews and behavior, online reviews and eWOM, information technology and UGC*, and *methodology* in social media

research. The above results indicate that social media research in both fields has been shaped by WOM since its inception. Whereas the business field seems to link social media research to marketing and social influence theories, the hospitality/tourism field appears to favor a specific form of WOM – online reviews. Nevertheless, future researchers should pursue social media research by leveraging WOM as their theoretical underpinnings.

The study also analyzed thematic trends of social media research in both fields by categorizing keywords into seven themes. As shown in Tables 3 and 4, the seven themes of keywords are defined as Foundation, Platform, Content, Business Sector, Managerial Application, Methodology, and Emerging Trend. In the business field, the theme of Business Sector did not contain any keywords in either sub-period, resulting in only six themes. The study revealed both similarities and differences in social media research between the business field and the hospitality/tourism field. Four similarities were uncovered, including the growth of social media research over time, the term "social media" gaining popularity, the new trend of social networking sites, and managerial applications as a research focus. On the other hand, four differences were also observed. The first was the use of WOM as a research foundation in business, while eWOM was used in hospitality/tourism. The second was the specific business sector focus in hospitality/tourism, which was not present in business. The third difference was stronger methodological support in the business field. Finally, different emerging trends were identified in each field. These findings provide a useful groundwork for scholars to engage in social media research. In addition, the identified key themes will assist researchers in both fields in keeping abreast of the main research topics and broadening the horizon of social media research. In this way, both theoretical and practical perspectives of a social media study can be revealed. For example, a typical social media research project should begin with a theoretical framework. It should also address both the methodological issues as well as managerial implications for the industry. In other words, a given study must not simply replicate the methodology that has been employed previously, but also provide true benefits that will help to improve industry practices.

Another unique contribution of this study is the examination of thematic evolution in social media research over time in both fields. Broken into two sub-periods, visualized networks of co-word revealed the research areas of focus for each sub-period. In the business field, the first sub-period (2007–2011) contained two broad areas of focus: "social network" and "WOM." The second sub-period (2012–2016) witnessed a new area of focus on "big data." In the hospitality/tourism field, three broad areas of research interest – "eWOM" research, "travel" "blog" research, and "Internet" based "marketing" – appeared to be popular in the first sub-period (2007–2011), while in the second sub-period (2012–2016), three different areas of interest arose, including the managerial applications of "social media," "eWOM," and "content analysis" of "UGC." While both the business and hospitality/tourism fields share much in common in terms of topical areas, it appears that social media research in hospitality/tourism covers more managerial applications, which is promising for the applicability of research findings. It is also interesting to note that social media research in the business field tended to not focus on a specific business sector. Conversely, research in the hospitality/tourism field seemed to address social media issues in a specific context such as a hotel or a destination. At the heart of the matter is whether social media research should be more generalizable across different business sectors or more focused on specific implications pertaining to one business sector.

Although bibliometric methods have already received enough attention in the hospitality and tourism research, the majority of previous studies used traditional bibliometric methods such as co-author and co-citation analysis, which failed to provide a picture of actual contents and research topics (Ding et al., 2001). This present study is among the first to apply both co-citation analysis and co-word analysis in exploring the state of art of social media research in hospitality and tourism. Consistent to the results of previous studies in library and information science, the combination usage of various bibliometric analyses helped to reveal details of research subjects for this study (Chang et al., 2015). The use of keywords in bibliometric analysis helps to reveal the research topics, interests, and even methodology focus in a particular research area, which could be applied in the future for literature review on other topics.

The findings also reveal many key areas related to social media that are under-researched in the hospitality/tourism literature. These areas are meaningful and promising for future social media research in the hospitality/tourism field. First, more effort should be made to study WOM in the context of social theories. According to the study results, social media research in business considered WOM as the most important theoretical foundation. Social media research in hospitality/tourism should pay more attention to WOM and the underlying social theories such as social ties, social influences, and social interactions. This would strengthen the theoretical foundation of social media research in the hospitality/tourism field. Second, social media research using big data and text mining methods should be encouraged in hospitality/tourism. As shown in the keyword analysis results, big data and text mining methods have emerged as new trends in social media research in the business field. However, they failed to receive enough attention in the hospitality/tourism field. Thus, this area of research focus is presented as a new opportunity in social media research. Lastly, a more diverse and complex set of research designs and techniques should be employed to advance social media research. Research within the hospitality/tourism field started off with seemingly no methodological focus. However, a plethora of research techniques are now used, including both qualitative and quantitative methods such as content analysis, netnography, and data mining. Going forward, the hospitality/tourism field needs to be innovative in utilizing more advanced methodologies. At this point, more research involving big data should be conducted in hospitality/tourism. For example, online review analytics should no longer be constrained to a single data source. Data from multiple platforms need to be collected and analyzed to allow for greater generalizability and further contribute to social media research (Xiang et al., 2017).

6. Limitations

The current study is not free from limitations. The data source was limited to only 16 journals in the business and hospitality/tourism fields. Thus, the patterns and trends generated in the study may not be generalized to all social media research in the hospitality and tourism disciplines. For example, some hospitality and tourism journals have published quite a few research articles on big data and social media. Future research should include more academic journals over a longer study period for better generalizability. Given an emerging research area, similar longitudinal review studies on social media should be replicated or repeated to identify new phenomena and issues surrounding this research topic. Besides, due to the limitations of bibliometric analysis, the definition of the clusters as the theoretical pillars of social media research might be biased. Moreover, the categorization of keywords into themes as a new research method may not be exempt from bias. Future research may develop an advanced classification method in order to better explore the research patterns and trends. Finally, other types of research techniques such as correspondence analysis can be incorporated to generate additional meaningful insight (Leung et al., 2015).

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