

Research paper

Examining the research on social media in business-to-business marketing with a focus on sales and the selling process

Bipul Kumar^a, Arun Sharma^{b,*}^a Marketing Department, Indian Institute of Management Indore, Prabhakar Shikhar, Rau-Pithampur Road, Indore 453331, India^b Department of Marketing Miami Herbert Business School University of Miami, 5250 University Drive, Coral Gables, FL, United States of America

A B S T R A C T

Social media and its impact on business-to-business marketing have received significant attention from practitioners and researchers. Social media has also impacted the selling process, and our research examines the extant literature to derive a deeper understanding of the area and identify directions for future research. This study reviews 115 articles on social media in business-to-business markets to understand sales and social media research within the social media domain. Using a multithread approach, this paper classifies social media research in business-to-business marketing into four subject clusters: adoption of social media; use of social media in business-to-business marketing; social media and the selling process; and social media and marketing strategy. This study then reviews 29 articles in sales and social media research and finds that the research can be classified into usage, performance, and framework. Due to the limited research on business-to-business sales and social media, we also report on a survey that examined directions for future research. We hope that this article serves as an impetus for future research in this area.

1. Introduction

Social media plays an extremely important role in business-to-business marketing. Social media interaction is used by 84% of C-level and VP-level buyers to make purchase decisions (Garofalo, 2016). Marketers in 83% of business-to-business firms use social media (Pulizzi & Handley, 2017). As a result of the Covid-19 pandemic and subsequent “new normal,” in which the number and duration of in-person visits are likely to remain minimal, social media's role could become more critical (Gavin, Harrison, Plotkin, Spillecke, & Stanley, 2020), and social media penetration in business-to-business selling could increase.

Social media has become a significant marketing element in business-to-consumer markets and is increasingly important in business-to-business markets. Therefore, it has received more attention due to enhanced technologies, the proliferation of applications, and an increase in networking sites that business-to-business marketers use (Ancillai, Terho, Cardinali, & Pascucci, 2019; Chuang, 2020; Michaelidou, Siamakka, & Christodoulides, 2011; Salo, 2017; Trainor, Andzulis, Rapp, & Agnihotri, 2014).

At the same time, we are also witnessing rising interest among business-to-business markets in using social media in the selling process, transforming sales processes and salespeople tasks (Agnihotri, Dingus, Hu, & Krush, 2016; Rapp, Beitelspacher, Grewal, & Hughes, 2013). Agnihotri, Kothandaraman, Kashyap, and Singh (2012) suggest that

social media selling refers to the use of technology by salespeople to generate content, develop networks, and enhance the selling process. Unfortunately, despite its potential, social media penetration remains low (Bill, Feurer, & Klarmann, 2020). Therefore, there is a need for a deeper understanding of business-to-business sales and social media.

To obtain such an understanding, we explored the literature in this area. We started with a comprehensive examination of the research on social media in business-to-business markets to understand how sales and social media fit in the overall domain. We found 115 research papers on social media use in business-to-business markets, published from January 2009 to December 2020, of which 29 were on sales and social media. We conducted a bibliometric analysis to gain insights into the overall literature and then analyzed sales-specific literature. The two-stage analysis helped us assess the role of sales research in the overall research on social media in business-to-business marketing. As we found that sales and social media is an important subdomain, we focused our inquiry on sales and social media research and its outcomes. This study investigates social media research in business-to-business markets, conducts research profiling of the literature, identifies its subdomains, and carries out a content analysis using text mining to visualize the evolution of research. The study then provides an analysis of the literature on sales and social media.

We start by presenting a brief description of the comprehensive studies in the area and bibliometric analysis, followed by an overview of

* Corresponding author.

E-mail addresses: bipul@iimdr.ac.in (B. Kumar), asharma@miami.edu (A. Sharma).<https://doi.org/10.1016/j.indmarman.2022.01.008>

Received 27 January 2021; Received in revised form 27 October 2021; Accepted 5 January 2022

Available online 15 January 2022

0019-8501/© 2022 Elsevier Inc. All rights reserved.

the literature selection, detailing the extraction of relevant articles in the area of social media in business-to-business markets. Next, examining co-citations allows us to identify significant subdomains of the research using hierarchical cluster analysis, followed by a multimethod approach. Then, we carry out a content analysis, using a text-mining technique to understand the evolution of research on the subject. Finally, we provide a review of the research on social media and the selling process.

1.1. Existing research examining social media in business-to-business markets

The literature on business-to-business sales and social media is a subset of the literature on social media in business-to-business markets. In order to understand the research on sales and social media, we need to understand the context in which the research resides, and therefore we examine the literature on social media in business-to-business markets. In our search of the literature, we find five papers that explore social media research in business-to-business marketing. First, Pascucci, Ancillai, and Cardinali (2018) examine 29 studies published from 2001 to 2017 and focus on the narrow area of social media adoption. The area of business-to-business sales and social media is not explored.

Second, Kumar, Sharma, Vatavwala, and Kumar (2020) examine digital mediation in the context of business-to-business marketing and highlight social media's emergence as a critical part of marketing strategy. Interestingly, 6 of the 15 most frequently cited articles on digital mediation were on social media, and 11 of the 15 articles with the highest citation rates per year were on social media (Kumar et al., 2020). However, Kumar et al. (2020) study focuses on digital mediation rather than social media, and it does not include an in-depth analysis of social media research. Although sales emerged as an area of research during 2010–14, the area of business-to-business sales and social media is not explored.

Third, Salo (2017) reviews the research on social media's role in business-to-business marketing by examining 39 articles published between 2011 and 2016 and one article from 2017. Salo (2017) identifies thematic research categories, including “advertising, buyer-seller relationships and business networks domain, computers in business marketing, decision support and management science, public relations and marketing and other functions, marketing communications, and sales.” Salo's (2017) review develops our initial understanding of the area, but there remains a need to reexamine the area. Salo (2017) discusses eight business-to-business sales and social media articles, and our research finds that an additional 21 articles that address sales and social media were subsequently published.

Fourth, Nunan, Sibai, Schivinski, and Christodoulides (2018) examine sales and social media research, focusing on identifying a diverse set of new directions for investigating social media within the sales process. They classify articles in the following categories: the value social media marketing creates in business-to-business sales relationships; characterizations of social media practices that create value in business-to-business sales relationships; identification of the drivers of social media practice adoption by business-to-business sales professionals; explanations of why social media practices create value; and qualifications of the conditions enabling social media practices to generate value in business-to-business sales relationships. Our analysis finds that 14 business-to-business social media research articles were used to highlight their categories. However, there is limited information on how the categories were created and the number of articles examined to populate their categories.

Fifth, Dwivedi, Ismagilova, Rana, and Weerakkody (2019) focus on classifying articles into effects of social media, social media use, social media tools, social media strategies, adoption of social media use, and measurement of the effectiveness of social media. Dwivedi et al. (2019) do not provide data on how the classification scheme was created or how the articles were classified. Research on bibliometric analysis suggests

that researchers should extract an intrinsic structure from extant research rather than forcing an external structure (McCain, 1990; Randhawa, Wilden, & Hohberger, 2016; White & McCain, 1998). For example, the area of business-to-business sales and social media is not explored in Dwivedi et al. (2019), although it emerges in our analysis as a category. Finally, the research in this area has expanded; Dwivedi et al. (2019) identify 70 studies, whereas our literature search identifies 115 studies.

There are three major reasons for a deeper examination of the literature. First, substantial research on social media and business-to-business markets has emerged in the last few years. We identify 115 research papers on social media use in business-to-business markets published from January 2009 to December 2020. The last five years (2016 to 2020) show a significant acceleration in that research, accounting for 79 out of the 115 articles (68.7%), with 2019 and 2020 contributing 41 articles (35.7%). As research increases, the need to understand emerging and future research grows. As examples, our analysis observes that research has moved from focusing on general social media to social media strategy to social media platforms. We also observe that sales emerged as a subdomain during 2014–18 and remained a subdomain during 2019–20. Second, there is a need to understand the structure of the research. Three research classification structures are proposed by Salo (2017), Nunan et al. (2018), and Dwivedi et al. (2019). Our analysis suggests that the typologies of articles have evolved. Third, no recent research has exhaustively examined the emerging literature on sales and social media. The last examination was by Nunan et al. (2018).

To obtain a deeper understanding, we conduct research on social media in business-to-business markets published from January 2009 to December 2020. We assess the role of sales research in the overall research on social media in business-to-business marketing and examine the importance of the subdomain, sales and social media. We profile the literature, identify its subdomains, and conduct content analysis using text mining to visualize the evolution of research. We then analyze the literature on sales and social media.

2. Bibliometric analysis

We first conducted a bibliometric analysis of research on social media in business-to-business markets to better understand the status of research on sales and social media within the broader context. Bibliometric analysis examines research on a subject from an objective and quantitative perspective, thus evaluating its scientific quality and its impact on the literature (Merigó, Mas-Tur, Roig-Tierno, & Ribeiro-Soriano, 2015) from an unbiased perspective (Kumar et al., 2020; Nerur, Rasheed, & Natarajan, 2008). Quantitative analysis helps understand the intrinsic structure of the knowledge on a subject (Martínez-López, Merigó, Gázquez-Abad, & Ruiz-Real, 2020; Samiee & Chabowski, 2012) and enables scientific evaluation of the literature and its impact on the overall body of knowledge (Merigó et al., 2015). The exhaustive collation of material for the bibliometric analysis provides nuanced and focused insights and helps in the progression of the literature (Arnott, 2007; Samiee & Chabowski, 2012). Researchers have used bibliometric analysis to examine the structure of research on digital mediation in business-to-business marketing (Kumar et al., 2020) and key-account management (Kumar, Sharma, & Salo, 2019).

We conducted a bibliometric analysis of social media research on business-to-business marketing by following established procedures (e.g., Kumar et al., 2020; Dagnino, Levanti, Minà, & Picone, 2015; Randhawa et al., 2016). The broad procedural stages are literature selection, research profiling, and document co-citation analysis.

Selection of database for the study: We used data from Google Scholar (citation analysis and research profiling) and ProQuest (document co-citation analysis). We selected these databases because of their comprehensive nature and use in previous research involving bibliometric analysis (e.g., Kumar et al., 2020).

3. Literature selection

We followed procedures that previous research used to analyze the literature (Kumar et al., 2020; Salo, 2017), particularly the three-stage process that Salo (2017) suggests. In the first stage, increased knowledge of the subject guided our literature review on social media in business-to-business marketing. In the second stage, we developed the literature review guidelines, then a protocol for the exclusion and inclusion of articles in the third stage. We included all studies focusing on social media in business-to-business marketing and excluded social media studies in business-to-consumer marketing. We developed guidelines to identify research on the subject and conducted keyword searches using terms such as “social media,” “social commerce,” “social media in business-to-business marketing,” and “social media marketing,” based on existing literature (e.g., Kumar et al., 2020; Salo, 2017). We also added keywords based on the abstracts of social media-related articles in the business-to-business marketing literature. Specifically, we explored the databases of ISI Web of Science, Scopus, Business Source Premier, Google Scholar, and Social Science Citation Index to identify papers on the topic of interest in business-to-business marketing based on the keywords and viewed their abstracts.

Next, we manually searched the titles and abstracts of leading marketing journals, including *Industrial Marketing Management*, *Journal of Marketing*, *Marketing Science*, *Journal of Marketing Research*, *Journal of the Academy of Marketing Science*, *Journal of Service Research*, *Journal of Business-to-Business Marketing*, *Journal of Personal Selling & Sales Management*, *Journal of Business and Industrial Marketing*, *Journal of Marketing Management*, and *Journal of Business Research*. Next, we searched unpublished research by examining proceedings of conferences (e.g., IMP, AMA, AMS) and ProQuest's dissertations list. We found that the first set of articles on social media in business-to-business marketing appeared in 2009. Therefore, we examined articles from January 2009 to December 2020 and found 115 articles that examine social media in business-to-business marketing.

4. Document co-citation analysis

Co-citation indicates the frequency with which two papers are cited together in the body of the literature. As it links the papers, it helps establish a word association and delineates the pattern of literature at a given time (Stevens, Giuliano, Heilprin, & Heilprin, 1965). The change in the focus and the intellectual pattern leads to changes in the co-citation pattern, providing a holistic view of the literature over a timeline (Small, 1973). We conducted document co-citation analysis to uncover social media research subdomains in business-to-business marketing. First, utilizing the ProQuest database, we created a co-citation frequency matrix for all 115 articles (Kumar et al., 2020; Harzing & Alakangas, 2016). Following extant research (e.g., McCain, 1990; White & McCain, 1998), we treated diagonals as missing values and used a mean co-citation threshold value for analysis (Marion & McCain, 2001; Nerur et al., 2008). Nerur et al. (2008) suggest calculating a mean co-citation rate by combining row or column values (except the diagonal values) and dividing the total by the number of articles, less one (Nerur et al., 2008). The mean co-citation values in each row and column are compared to the number of years of analysis (11 in our case : 2020–2009 = 11), and articles with mean co-citation values equal to or greater than 11 are retained. Following this process, we retained 48 articles and created a co-citation matrix for further analysis and to uncover subdomains (Dagnino et al., 2015; McCain, 1998; Tsay, Shen, & Liang, 2016). Identifying subdomains requires understanding which articles are cited together. A proximity value matrix was created from the co-citation matrix of the order 48×48 , where the correlation (Pearson coefficients) values varied from 0 to 1 (Kumar et al., 2020).

To better comprehend social media subdomains in business-to-business markets, we conducted three analyses that examined the data

in different ways (e.g., Kumar et al., 2020; Samiee & Chabowski, 2012). We used hierarchical cluster analysis (HCA) to understand the natural clusters in the data (subdomains). To understand similarities in cases and perform non-linear dimensionality reduction to highlight subdomains, we used metric multidimensional scaling (MDS). Finally, to understand the dimensionality in the data to identify subdomains, we used exploratory factor analysis (EFA). The idea behind multimethod analysis was to compare and contrast the outcomes of the three methods with regard to their overlap and exclusivity. We explain the three methods in subsequent sections.

4.1. Hierarchical cluster analysis

We used hierarchical cluster analysis (HCA) to identify the subdomains of existing research using Ward's method and a proximity matrix of 48 impactful articles as input. Based on a significant analysis of variance result ($p < 0.001$), a four-cluster solution emerged (Kumar et al., 2020; Dillon & Goldstein, 1984). Clusters 1 and 2 each had 9 articles, cluster 3 had 17 articles, and cluster 4 had 13 articles. Using VOSviewer software, we conducted a content analysis of each article's abstract in each cluster to identify common keywords, and name and understand each cluster.

4.1.1. Results from hierarchical cluster analysis

We identified the four clusters from the analysis and labeled them: adoption of social media; use of social media in business-to-business marketing; social media and the selling process; and social media and marketing strategy. We discuss the clusters in a later section.

4.2. Metric multidimensional scaling

To better understand the subdomains, we also conducted metric multidimensional scaling (MDS), which highlights and identifies gradual differences among the articles on a constant dimension. We used a proximity matrix with 48 articles as input, running ALSCAL routines based on MDS. Consistent with similar research, we arrived at a stress value equal to 0.07, considered a good fit (Kumar et al., 2020; Samiee & Chabowski, 2012).

4.2.1. Results from metric multidimensional scaling

As Fig. 1 shows, MDS provides a graphical visualization of the articles in two dimensions aligned along four quadrants. We provide an interpretation of the articles in each quadrant when we compare the results of our analysis.

4.3. Exploratory factor analysis

We also carried out exploratory factor analysis (EFA) to understand the underlying structures and subdomains by reducing the data. Cluster analysis groups similar cases together, whereas factor analysis helps discover how smaller groups represent the dataset's original features, characterized by the emerging factors. The goal was to reach a deeper understanding by comparing and contrasting the findings of HCA and EFA.

We used the proximity matrix of 48 articles (co-citation frequencies) to conduct EFA. As we were analyzing a dataset of articles from different subdomains, we expected a non-orthogonal relationship. Therefore, we used direct oblimin rotation (Samiee & Chabowski, 2012). A threshold factorial weight score of greater than 0.4 was considered for including an article in the analysis (Kumar et al., 2020; Tran et al., 2019; Wang & Chen, 2013).

4.3.1. Results from exploratory factor analysis

From EFA, we found four factors using the scree plot representing 77.534% cumulative variance. Table 1 presents the results.

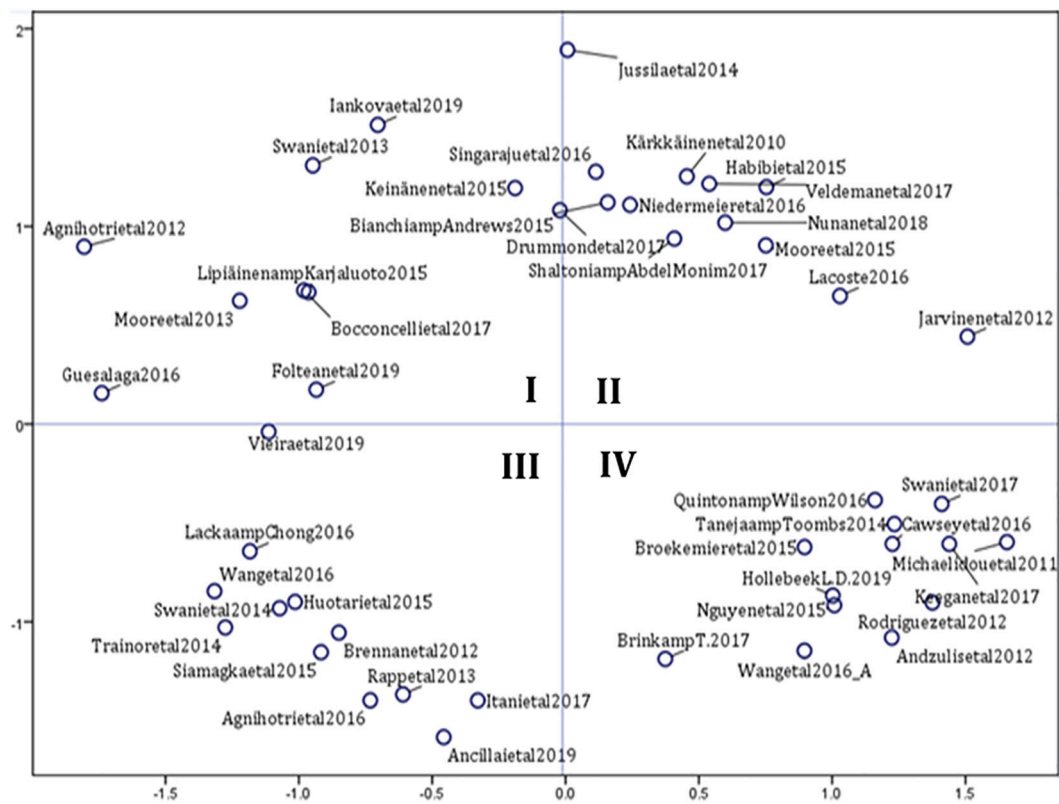


Fig. 1. Metric multidimensional scaling.

Table 1
EFA (Exploratory Factor Analysis) results.

First Factor		Second Factor		Third Factor		Fourth Factor	
Article	Loading	Article	Loading	Article	Loading	Article	Loading
Karjaluo et al. (2015)	0.913	Veldeman, Van Praet, and Mechant (2017)	0.896	Rodriguez et al. (2012)	0.973	Nguyen, Yu, Melewar, and Chen (2015)	0.623
Lipiäinen & Karjaluo (2015)	0.913	Jussila et al. (2014)	0.884	Ancillai et al. (2019)	0.958	Cawsey et al. (2016)	0.574
Lacka and Chong (2016)	0.734	Kärkkäinen et al. (2010)	0.873	Wang et al. (2016)	0.957	Taneja and Toombs (2014)	0.546
Huotari et al. (2015)	0.687	Brennan et al. (2012)	0.872	Agnihotri et al. (2012)	0.957	Bianchi and Andrews (2015)	0.518
Siamagka et al. (2015)	0.685	Habibi, Hamilton, Valos, and Callaghan (2015)	0.844	Moore et al. (2013)	0.925	Hollebeek (2019)	0.401
Wang et al. (2016)	0.643	Jarvinen et al. (2012)	0.816	Moore et al. (2015)	0.909		
Swani, Milne, and Brown (2013)	0.626	Broekemier et al. (2015)	0.709	Lacoste (2016)	0.908		
Singaraju et al. (2016)	0.617	Brink (2017)	0.700	Guesalaga (2016)	0.893		
Shaltoni (2017)	0.535	Michaelidou et al. (2011)	0.585	Bocconcelli et al. (2017)	0.872		
Iankova et al. (2019)	0.508			Andzulis et al. (2012)	0.864		
Foltean, Trif, and Tuleu (2019)	0.402			Quinton and Wilson (2016)	0.864		
				Itani et al. (2017)	0.851		
				Nunan et al. (2018)	0.837		
				Swani et al. (2017)	0.816		
				Swani et al. (2014)	0.758		
				Rapp et al. (2013)	0.715		
				Niedermeier et al. (2016)	0.666		
				Trainor et al. (2014)	0.647		
				Agnihotri et al. (2016)	0.640		
				Keegan et al. (2017)	0.629		

4.4. Comparison of clusters from different analyses

Overall, we found similarities among the four categories that emerged from each analysis (see Table 2 for descriptions and exemplars

of subdomains) but observed some differences, as has prior research (Kumar et al., 2020; Samiee & Chabowski, 2012). We use HCA clusters as the base and discuss the differences across the methods accordingly. Although we found a consensus of main themes in the identified clusters,

Table 2

The sub-domains of research on social media in business-to-business marketing.

Cluster	Description	Research Exemplars
1	Adoption of social media	<ul style="list-style-type: none"> • Factors that drive successful adoption of social media. • Role of content creation in successful social media strategy.
2	Use of social media in business-to-business marketing	<ul style="list-style-type: none"> • The potential of impact of using social media by firms. • Types of social media used in business-to-business marketing.
3	Social media and the selling process	<ul style="list-style-type: none"> • Role of social media in the sales and selling process. • Use of social media in selling processes such as prospecting, objection handling, and after-sales support. • Role of social media in key account selling and relationship-oriented selling activities. • Impact of social media on information communication behaviors resulting in responsiveness and customer satisfaction.
4	Social media and marketing strategy	<ul style="list-style-type: none"> • Use of Twitter in firms' communication strategy to assist in brand and sales strategies. • The influence of digital communications initiated by the firm or the market on customer acquisition and sales. • Multi-stakeholder systems are used to explain value co-creation and social media's role as a system resource integrator with strategic implications.

they also contained a few articles that differed.

The four clusters that emerged were adoption of social media; use of social media in business-to-business marketing; social media and the selling process; and social media and marketing strategy. The clusters highlighted the importance of sales and social media research within the context of research on social media in business-to-business markets. The following section discusses each cluster as it emerged, focusing on social media and the selling process and less deep discussion on the other clusters.

4.4.1. Cluster 1: Adoption of social media by business-to-business marketing firms

Cluster 1 includes nine articles. The cluster's focus is the adoption of social media. Authors suggest that key criteria for the successful adoption of social media by business-to-business marketing firms are usefulness, usability, right content creation, organizational innovativeness, compatibility, and customer pressure.

Within the context of adoption, we provide some exemplars of research. The focus of research has been on usefulness, usability, and utility in social media adoption (Lacka & Chong, 2016); organizational innovativeness and perceived usefulness (Siamagka, Christodoulides, Michaelidou, & Valvi, 2015); competitor and customer pressure, perceived relative advantage, organizational innovativeness, and compatibility (Shaltoni, 2017); corporate culture, peers' support, and other personal factors (Keinänen and Kuivalainen, 2015); and social comparison as driving social identity and online communities on social media (Wang, Hsiao, Yang, & Hajli, 2016; Wang, Pauleen, & Zhang, 2016).

4.4.1.1. Examining the results from different methods. Although the results were similar, different methods classified some articles differently. HCA contained 9 articles, MDS 11 articles, and EFA 11 articles. The key difference relates to social media's role as a system resource integrator (Singaraju, Nguyen, Niininen, & Sullivan-Mort, 2016) and the relationship between the importance of social media and its perceived effectiveness (Iankova, Davies, Archer-Brown, Marder, & Yau, 2019).

4.4.2. Cluster 2: Use of social media in business-to-business marketing

This cluster contains nine articles derived from HCA and examines the use of social media in business-to-business marketing. Examples of research focus include social media's innovation potential (Kärkkäinen, Jussila, & Väisänen, 2010); social media and brand awareness (Michaelidou et al., 2011); geographic differences in goals and outcomes (Brennan & Croft, 2012); and social media objectives (Broekemier, Chau, & Seshadri, 2015).

4.4.2.1. Examining the results from different methods. Although the results were similar, different methods classified some articles differently. HCA classified 9 articles, MDS classified 11 articles, and EFA classified 9 articles. Based on our observations, we discuss differences among the three classification methods. The difference between HCA and EFA is the gap between the perceived potential and the actual usage of social media (Jussila, Kärkkäinen, & Aramo-Immonen, 2014). The difference between HCA and MDS is the differential use of social media in business-to-business marketing (e.g., Brennan & Croft, 2012).

4.4.3. Cluster 3: Social media and the selling process

The third cluster from HCA consists of 17 articles that emphasize social media's use in the selling process. This is the area of our focus, and we provide more details in this section. In one of the initial studies exploring social media's role in sales and the selling process, Andzulis, Panagopoulos, and Rapp (2012) highlight the challenges of using social media. Rodriguez, Peterson, and Krishnan (2012) find a positive association between the use of social media and sales performance. In another important study, Agnihotri et al. (2012) suggest that social media tools could help salespeople perform services and enhance value creation. Moore, Hopkins, and Raymond (2013) study professional salespeople and find that their use of social media for relational selling leads to distinctive prospecting, objection handling, and after-sale follow-up. Other significant studies in this cluster highlight critical issues such as the role of social media in communication in the sales process (Nunan et al., 2018) and key-account selling (Lacoste, 2016); relationship-focused social media (Moore, Raymond, & Hopkins, 2015); the role of organizational competence and commitment in social media usage (Guesalaga, 2016); and effects of social media adoption on sales processes (Bocconcelli, Cioppi, & Pagano, 2017).

Extending the research on the topic, Agnihotri et al. (2016) find that salespeople's use of social media for information communication enhances customers' responsiveness and satisfaction. Similarly, Itani, Agnihotri, and Dingus (2017) suggest that salespeople's learning orientation and attitude toward social media usefulness drive their effectiveness in using social media for their job tasks. Ancillai et al. (2019) develop a framework to better understand social media's role in sales processes.

The other articles included in this cluster focus on the use of social media in building networks and relationships leading to better performance (Quinton & Wilson, 2016); the relationship between the use of social media apps and business performance outcomes (Wang, Hsiao, et al., 2016; Wang, Pauleen, & Zhang, 2016); differences between social media message strategies of business-to-business and business-to-consumer firms and their impact on branding, information search, message appeals, and selling (Swani, Milne, Brown, Assaf, & Donthu, 2017); the relationship between supplier, retailer, and customer in the age of social media, in the context of service ambidexterity and brand reputation (Rapp et al., 2013); and social media technologies' impact on firms' social CRM capabilities (Trainor et al., 2014).

4.4.3.1. Examining the results from different methods. Although the results were similar, different methods classified some articles differently. In this cluster, HCA classified 17 articles, MDS classified 12 articles, and EFA classified 20 articles. Based on our observations, we discuss differences among the three classification methods. The results from EFA

include recommendations that business-to-business marketers, in their tweets related to branding and selling activities, should focus more on emotional than functional appeals (Swani, Brown, & Milne, 2014). The additional articles classified by EFA examine, in the context of networks, the role of salespeople's use of social media (Niedermeier, Wang, & Zhang, 2016) and evaluating social media outcomes through a stage model (Keegan & Rowley, 2017).

The difference between HCA and MDS focuses on social media in key-account selling and relationship-oriented selling activities (Lacoste, 2016); social media in service behavior and value creation (Agnihotri et al., 2012); salient differences between focusing on consumers and businesses in social media message strategies (Swani et al., 2017); the role of social media in organic search communications, selling, and customer acquisition activities (Vieira, de Almeida, Agnihotri, & Arunachalam, 2019); marketers' perceptions of the attributes and utility of social media sites (Lacka & Chong, 2016); and the relationship between social media and content creation (Huotari, Ulkuniemi, Saraniemi, & Mäläskä, 2015).

4.4.4. Cluster 4: Social media and marketing strategy

This cluster includes 13 articles that cover the role of social media in marketing strategy. Some important topics include the use of Twitter (Swani et al., 2014); strategic approaches to using social media in brand-building strategies (Cawsey & Rowley, 2016); the impact of social media on marketing strategies (Taneja & Toombs, 2014); and developing a stage model for evaluating social media marketing (Keegan & Rowley, 2017).

4.4.4.1. Examining the results from different methods. Although the results were similar, different methods classified some articles differently. HCA classified 13 articles, MDS classified 13 articles, and EFA classified 5 articles in this cluster. The differences focused on communication strategies.

Summary: The four-group research classification that emerged from the analysis confirmed the importance of sales and social media, which emerged as its own group. The classification scheme also demonstrated the need for this study. Pascucci et al. (2018) discuss the adoption of social media, and our classification suggests a broader examination of social media in business-to-business markets. Second, Kumar et al. (2020) identify social media as a single category, and there is a need for a deeper examination within the category. Third, Salo (2017) identifies research categories, and the present research suggests that the categories have subsequently evolved. Finally, the research categories identified by Nunan et al. (2018) and Dwivedi et al. (2019) are different and did not emerge from our analysis.

5. Visualization of research using text mining

In the previous section, we examine the literature and classify it into four groups: adoption of social media; use of social media in business-to-business marketing; social media and the selling process; and social media and marketing strategy. In this section, we examine the evolution of research on social media. We conducted automated content analysis-based text mining, which reduces analysis time and biases and provides a visual output that enhances our understanding of an area (Kumar et al., 2020).

We used Leximancer software that utilizes a Bayesian algorithm to understand the textual data (using proximity values) and provides themes and concepts based on counting word frequencies and co-occurrence of data (Smith & Humphreys, 2006). We analyzed the abstracts of the 115 articles in our database. To better understand the shifts in research focus and follow existing practices (Kumar et al., 2020; Kumar et al., 2019), we categorized the studies into two five-year periods (2009–13 and 2014–18) and one two-year period (2019–20). This helps to delineate the changes taking place in the literature. The text

mining technique highlights the concepts and categories in a subject area or domain, showing their properties and relations (Biesenthal & Wilden, 2014). Circles represent themes based on the aggregation of the concepts constructed by the underlying relationship between concepts. The distance between the concepts indicates the depth of the relationship between constructs (Campbell, Pitt, Parent, & Berthon, 2011). The importance of a theme is indicated by both the color and the size of the circle. Brighter and bigger circles show more important themes, and overlapping circles suggest overlapping concepts.

5.1. Results of visualization

Fig. 2 shows the output of the analysis using Leximancer software, detailing concepts, themes, and the interrelationships among them. As mentioned earlier, data were categorized into five-year periods from 2009 to 2013 and from 2014 to 2018, and the last period was from 2019 to 2020. These three time periods have 20, 54, and 41 articles, respectively.

Distinct themes emerged in each period. These are discussed next.

5.1.1. 2009–13: Antecedents, barriers, and consequences of the adoption of social media

This period correlates with the emergence of social media in business-to-business marketing. The two important circles signifying this period are social media and its applications, with the circle representing social media carrying more relevance to the domain. This period corresponds to the emerging research in the area.

5.1.2. 2014–18: Social media as an enabler of business-to-business marketing

In this period, research focuses on the role of social media as an enabler of business-to-business marketing. The analysis revealed three important circles representing themes: strategy, sales, and usage of social media. The less important themes include branding, framework, and small and medium-sized businesses. Our focus, sales and social media, emerged as an important research area during this period.

5.1.3. 2019–20: Mainstreaming of social media in business-to-business marketing

The research published in 2019–20 suggests the mainstreaming of social media as a part of business-to-business marketing. Four major themes emerged from the analysis: social media platforms, engagement, sales, and relationships. Once again, our focus, sales and social media, is an important area of research.

6. Implications for sales and social media

Our multimethod classification analysis demonstrates that although articles were categorized into four categories using different methodologies, there is general agreement among the methods in defining the focus area of extant research. The subdomain of interest, sales and social media, focused on the role of social media in sales and the selling process; the use of social media in sales processes such as prospecting, objection handling, and after-sales support; the role of social media in key-account selling and relationship-oriented selling activities; and the impact of social media on information communication behaviors resulting in responsiveness and customer satisfaction.

Our data visualization analysis demonstrates that although sales was not a subdomain during 2009–13, it emerged as a subdomain during 2014–18 and remained a subdomain in 2019–20. The size of the circle shrunk, suggesting that, proportionally, fewer articles addressed sales and social media. Therefore, we seek a deeper examination of the area of sales and social media.

Our results also demonstrate the need for a deeper analysis of the area. Nunan et al. (2018) and Dwivedi et al. (2019) create classifications that they use in their analyses. In contrast, we conducted multimethod

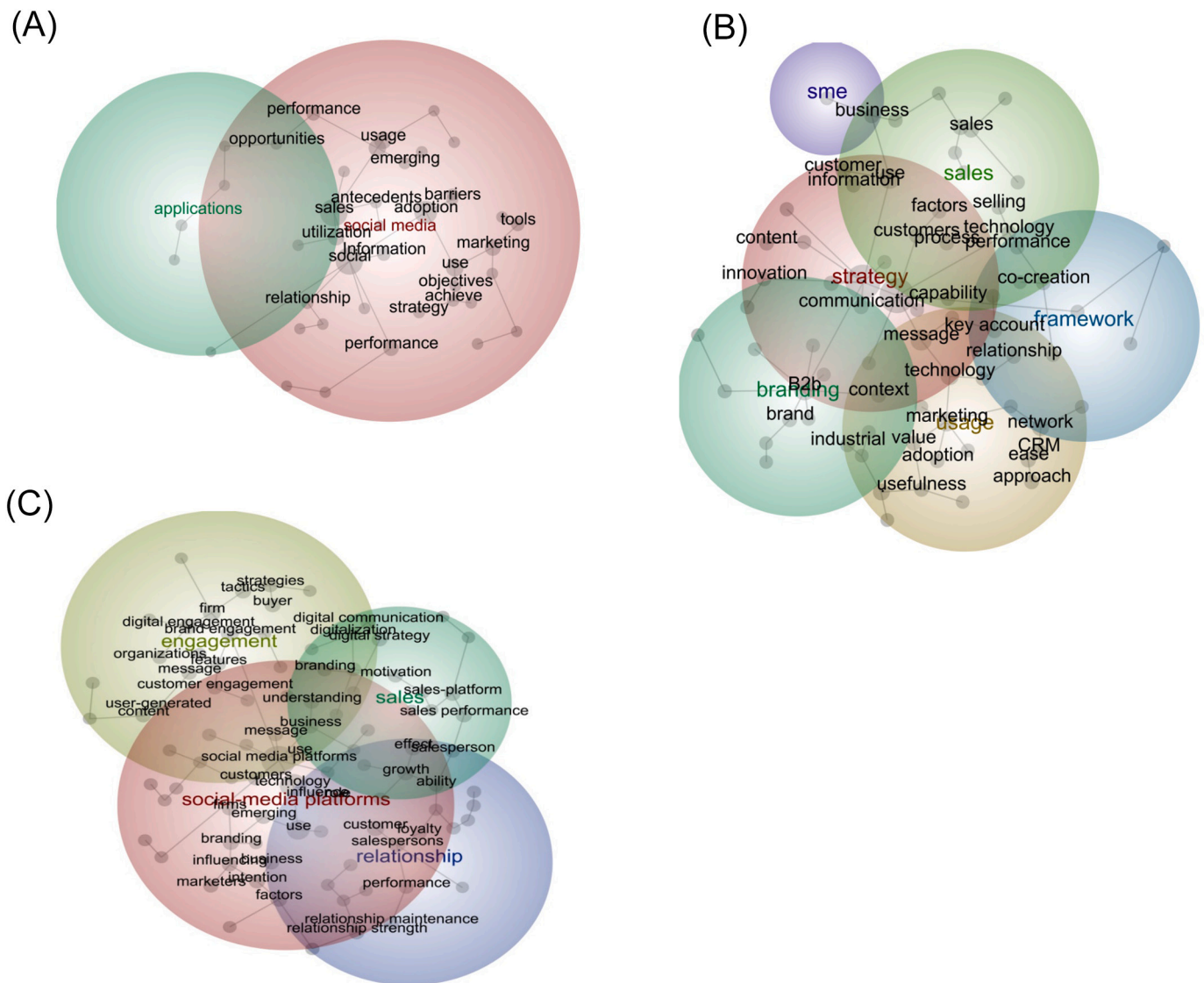


Fig. 2. Visualization of research using content analysis.
 (A) 2009–2013: Antecedents, Barriers, and Consequences of the Adoption of Social Media.
 (B) 2014–2018: Social Media as an Enabler of Business-to-Business Marketing.
 (C) 2019–2020: Mainstreaming of Social Media in Business-to-Business Marketing.

classification analyses and visualization to uncover the subdomains. The difference can be seen in the results. The aforementioned studies have no classification that includes sales and social media, whereas our analysis consistently had a cluster of research focused on sales and social media.

7. Research on sales and social media

As our primary research focus is sales and social media, we conducted a bibliometric analysis of sales and social media research. We examined the 115 articles in our database and focused on research that addressed social media and the selling process (SMSP). We identified 29 SMSP articles, presented in Table 3. Of these, 7 articles, or 24.1%, were published in 2020, suggesting a continuing research interest in sales and social media. We first examined the impact of authors and papers in this area. Next, we conducted visualization analysis of research topics on social media and sales and selling processes using text mining. Finally, we conducted bibliometric and visualization analyses of authors/papers on sales and social media, through prestige and network analysis.

We examined the research profile of sales and social media research in business-to-business marketing and the impact of journals and authors (Kumar et al., 2020) in Table 4. Although the highest number of articles were published in *Industrial Marketing Management* (11 articles = 37.93%), the articles were cited less (1004 citations) than those in the *Journal of Personal Selling and Sales Management*, which published three articles but had the highest number of citations (1050). Other journals had fewer published articles and less than 100 citations. Among the authors, Agnihotri had the highest number, and Guesalaga had the second-highest number of articles, citations, and citations per year (see Appendix B for the formulas).

As Table 5 shows, the five most frequently cited articles are by Andzulis et al. (2012), Agnihotri et al. (2016), Agnihotri et al. (2012), Rodriguez et al. (2012), and Guesalaga (2016). The highest number of citations were of Andzulis et al. (2012), and the highest number of citations per year were of Agnihotri et al. (2016).

Table 3
Studies on sales and social media.

Article (sorted by year and author)
Andzulis, J. M., Panagopoulos, N. G., & Rapp, A. (2012). A review of social media and implications for the sales process. <i>Journal of Personal Selling & Sales Management</i> , 32(3), 305–316.
Agnihotri, R., Kothandaraman, P., Kashyap, R., & Singh, R. (2012). Bringing “social” into sales: The impact of salespeople's social media use on service behaviors and value creation. <i>Journal of Personal Selling & Sales Management</i> , 32(3), 333–348.
Groza, M., Peterson, R., Sullivan, U. Y., & Krishnan, V. (2012). Social media and the sales force: the importance of intra-organizational cooperation and training on performance. <i>The Marketing Management Journal</i> , 22(2), 118–130.
Rodriguez, M., Peterson, R. M., & Krishnan, V. (2012). Social media's influence on business-to-business sales performance. <i>Journal of Personal Selling & Sales Management</i> , 32(3), 365–378.
Schultz, R. J., Schwepker, C. H., & Good, D. J. (2012). Social media usage: an investigation of B2B salespeople. <i>American Journal of Business</i> , 27(2), 174–194.
Schultz, R. J., Schwepker, C. H., & Good, D. J. (2012). An exploratory study of social media in business-to-business selling: salesperson characteristics, activities and performance. <i>Marketing Management Journal</i> , 22(2), 76–89.
Moore, J. N., Hopkins, C. D., & Raymond, M. A. (2013). Utilization of relationship-oriented social media in the selling process: A comparison of consumer (B2C) and industrial (B2B) salespeople. <i>Journal of Internet Commerce</i> , 12(1), 48–75.
Rollins, M., Nickell, D., & Wei, J. (2014). Understanding salespeople's learning experiences through blogging: A social learning approach. <i>Industrial Marketing Management</i> , 43(6), 1063–1069.
Moore, J. N., Raymond, M. A., & Hopkins, C. D. (2015). Social selling: A comparison of social media usage across process stage, markets, and sales job functions. <i>Journal of Marketing Theory and Practice</i> , 23(1), 1–20.
Agnihotri, R., Dingus, R., Hu, M. Y., & Krush, M. T. (2016). Social media: Influencing customer satisfaction in B2B sales. <i>Industrial Marketing Management</i> , 53, 172–180.
Guesalaga, R. (2016). The use of social media in sales: Individual and organizational antecedents, and the role of customer engagement in social media. <i>Industrial Marketing Management</i> , 54, 71–79.
Lacoste, S. (2016). Perspectives on social media and its use by key account managers. <i>Industrial Marketing Management</i> , 54, 33–43.
Niedermeier, K. E., Wang, E., & Zhang, X. (2016). The use of social media among business-to-business sales professionals in China. <i>Journal of Research in Interactive Marketing</i> , 10(1), 33–49.
Rodriguez, M., Ajjan, H., & Peterson, R. M. (2016). Social media in large sales forces: an empirical study of the impact of sales process capability and relationship performance. <i>Journal of Marketing Theory and Practice</i> , 24(3), 365–379.
Bocconcelli, R., Cioppi, M., & Pagano, A. (2017). Social media as a resource in SMEs' sales process. <i>Journal of Business & Industrial Marketing</i> , 32(5), 693–709.
Itani, O. S., Agnihotri, R., & Dingus, R. (2017). Social media use in B2B sales and its impact on competitive intelligence collection and adaptive selling: Examining the role of learning orientation as an enabler. <i>Industrial Marketing Management</i> , 66, 64–79.
Agnihotri, R., Trainor, K. J., Itani, O. S., & Rodriguez, M. (2017). Examining the role of sales-based CRM technology and social media use on post-sale service behaviors in India. <i>Journal of Business Research</i> , 81, 144–154.
Gáti, M., Mitev, A., & Bauer, A. (2018). Investigating the impact of salesperson's use of technology and social media in their customer relationship performance in B2B settings. <i>Trziste Market</i> , 30(2), 165–176.
Nunan, D., Sibai, O., Schivinski, B., & Christodoulides, G. (2018). Reflections on “social media: Influencing customer satisfaction in B2B sales” and a research agenda. <i>Industrial Marketing Management</i> , 75, 31–36.
Ancillai, C., Terho, H., Cardinali, S., & Pascucci, F. (2019). Advancing social media driven sales research: Establishing conceptual foundations for B-to-B social selling. <i>Industrial Marketing Management</i> , 82, 293–308.
Vieira, V. A., de Almeida, M. I. S., Agnihotri, R., & Arunachalam, S. (2019). In pursuit of an effective B2B digital marketing strategy in an emerging market. <i>Journal of the Academy of Marketing Science</i> , 47(6), 1085–1108.
Zhang, C. B., & Li, Y. N. (2019). How social media usage influences B2B customer loyalty: roles of trust and purchase risk. <i>Journal of Business & Industrial Marketing</i> , 34(7), 1420–1433.
Agnihotri (2020). Social media, customer engagement, and sales organizations: A research agenda. <i>Industrial Marketing Management</i> , 90(2020), 291–299.
Bill, F., Feurer, S., & Klarmann, M. (2020). Salesperson social media use in business-to-business relationships: An empirical test of an integrative framework linking antecedents and consequences. <i>Journal of the Academy of Marketing Science</i> , 48, 734–752.
Chuang, S. H. (2020). Co-creating social media agility to build strong customer-firm relationships. <i>Industrial Marketing Management</i> , 84, 202–211.
Guenzi, P., & Nijssen, E. J. (2020). Studying the antecedents and outcome of social media use by salespeople using a MOA framework. <i>Industrial Marketing Management</i> , 90, 346–359.

Table 3 (continued)

Article (sorted by year and author)
Koponen, J. P., & Rytty, S. (2020). Social presence and e-commerce B2B chat functions. <i>European Journal of Marketing</i> , 54(6), 1205–1224.
Enyinda, C. I., Opute, A. P., Fadahunsu, A., & Mbah, C. H. (2020). Marketing-sales-service interface and social media marketing influence on B2B sales process. <i>Journal of Business & Industrial Marketing</i> , 36(6), 990–1009.
Itani, O. S., Krush, M. T., Agnihotri, R., & Trainor, K. J. (2020). Social media and customer relationship management technologies: Influencing buyer-seller information exchanges. <i>Industrial Marketing Management</i> , 90, 264–275.

7.1. Visualization of research topics on social media and sales using text mining

Using text-mining software Leximancer, we conducted a content analysis of 29 identified SMSP articles on social media in business-to-business sales to visualize research topics. As Fig. 3 shows, the analysis resulted in three important circles representing three distinct themes: usage, performance, and framework. The terms such as “commitment” represent concepts and are the output of text analysis. The Leximancer software for text analysis uses a Bayesian learning algorithm to estimate the proximity values between the textual data and provides labels such as “commitment,” as shown in Fig. 3 (Kumar et al., 2020). The inherent relationship among the concepts forms the basis for the themes such as “usage.”

Based on the circle's bright color, “usage” emerged as the most important theme. Some important studies highlighting this theme explore the usage of social media in sales, emphasizing the role of firm-level competence and commitment (Guesalaga, 2016); the role of social media in the business-to-business sales process (Andzulis et al., 2012; Schultz, Schwepker, & Good, 2012a, 2012b); the use of social media for information communication leading to customer satisfaction (Agnihotri et al., 2016); social media usage and its positive impact on relational sales (Rodriguez et al., 2012); and the use of relationship-oriented social media by salespeople to accomplish social CRM tasks (Moore et al., 2015).

The second theme, “framework,” focuses on the frameworks to understand how social media tools help salespeople perform necessary service behaviors (Agnihotri et al., 2012), digital communication for salespeople (Vieira et al., 2019), factors driving salespeople's use of social media in business-to-business relationships to attain customer loyalty (Bill et al., 2020), and motivation-opportunity-ability theory to study the antecedents and outcomes of social media adoption by salespeople (Guenzi & Nijssen, 2020). The third theme, “performance,” focuses on sales outcomes. These include social media as the modern gateway to networks and its impact on sales performance in China (Niedermeier et al., 2016); the role of relationship performance in social media utilization by firms with a large sales force (Rodriguez, Ajjan, & Peterson, 2016); attitude toward social media and its impact on sales performance (Gáti, Mitev, & Bauer, 2018); and the relationship between social media use and commensurate sales performance (Groza, Peterson, Sullivan, & Krishnan, 2012).

7.2. Bibliometric analysis and visualization of authors/papers on sales and social media

We could not conduct EFA and MDS due to the small number (29) of sales-based (SMSP) articles. However, we could carry out prestige and network analyses using Gephi software, a network analysis and visualization software that uses a three-dimensional render engine to provide expressive illustrations of networks (Fahimnia, Sarkis, & Davarzani, 2015).

To analyze the data, we first obtained “ris” data outputs from Scopus and inputted these into BibExcel to create “.net” files. BibExcel software is designed to assist a user in analyzing bibliographic data and enables the generation of “.net” data files that can be imported into Gephi (<http>

Table 4

Impact of journals and authors (weighted) on research on social media and the selling process.

Journal	Publication Rank	Articles (Number)	Articles (Percentage)	Citation Rank	Number of Citations
IMM	1	11	37.93%	2	1004
JPSSM	2	3	10.34%	1	1050
JBIM	2	3	10.34%	5	67
JAMS	3	2	6.89%		
JMTP	3	2	6.89%	3	87
JIC				4	80

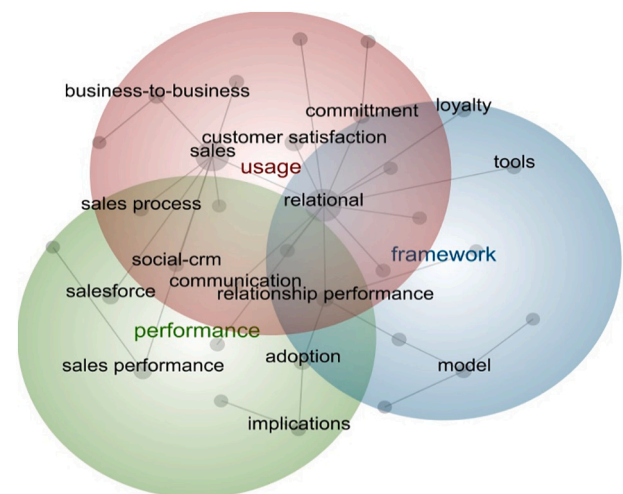
Rank	Author(s)	Number of Articles	Rank	Author(s)	Total Citations	Rank	Author(s)	Citations per Year
1	Agnihotri, R.	2.580	1	Agnihotri, R.	300.67	1	Agnihotri, R.	55.07
2	Guesalaga, R. /Chuang, S. H.	1.000	2	Guesalaga, R.	163.00	2	Guesalaga, R.	40.75
3	Peterson, R. M.	0.917	3	Andzulis, J.M. / Rapp, A. / Panagopoulos, N.G.	153.34	3	Dingus, R.	33.431
4	Rodriguez, M.	0.670				4	Hu, M. Y. / Krush, M. T.	24.875

Table 5

Top five social media and the selling process articles (citations and citations per year).

Article	Total Citations (Rank)	Citations per Year (Rank)	Journal
Andzulis, J. M., Panagopoulos, N. G., & Rapp, A. (2012). A review of social media and implications for the sales process. <i>Journal of Personal Selling & Sales Management</i> , 32(3), 305–316.	460 (1)	57.5 (2)	JPSSM
Agnihotri, R., Dingus, R., Hu, M. Y., & Krush, M. T. (2016). Social media: Influencing customer satisfaction in B2B sales. <i>Industrial Marketing Management</i> , 53, 172–180.	398 (2)	99.5 (1)	IMM
Agnihotri, R., Kothandaraman, P., Kashyap, R., & Singh, R. (2012). Bringing "social" into sales: The impact of salespeople's social media use on service behaviors and value creation. <i>Journal of Personal Selling & Sales Management</i> , 32(3), 333–348.	298 (3)	37.25 (4)	JPSSM
Rodriguez, M., Peterson, R. M., & Krishnan, V. (2012). Social media's influence on business-to-business sales performance. <i>Journal of Personal Selling & Sales Management</i> , 32(3), 365–378.	292 (4)	36.5 (5)	JPSSM
Guesalaga, R. (2016). The use of social media in sales: Individual and organizational antecedents, and the role of customer engagement in social media. <i>Industrial Marketing Management</i> , 54, 71–79.	163 (5)	40.75 (3)	IMM

[s://sites.google.com/site/bibexcel2015/](https://sites.google.com/site/bibexcel2015/)). We used the output of the analysis as input data for subsequent network analysis using Gephi software. Gephi is a visualization software that helps transform networks into maps, providing better visualization (Jacomy, Venturini, Heymann, & Bastian, 2014). It is complementary to the other available statistical tools and helps visualize networks using interactive interfaces. Beyond MDS and factors analysis, it provides interactive graphs, networks up to 100,000 nodes and 1,000,000 edges, and visualization with the help of a dynamic filtering mechanism (<https://gephi.org/features/>). It is equally useful in analyzing larger and smaller datasets using

**Fig. 3.** Visualization of research on sales and selling process using content analysis.

(Three Distinct Themes: Usage, Performance, and Framework)

prestige and network analysis.

We discuss Gephi's two main outputs: prestige analysis, which enables an understanding of important articles in the domain, and co-citation analysis, which allows for the major clusters to be deciphered.

7.2.1. Prestige analysis

A prestigious actor is defined as one who is the object of extensive ties as a recipient. Rank prestige is, by far, the most commonly used prestige measure and takes into account the prestige of nodes linking (direct or indirectly) to a given node. The prestige analysis in Gephi software uses a PageRank algorithm that gives preference to articles co-cited in reputable outlets, indicating the frequency at which an article is cited by other highly cited papers (Xu et al., 2018). It essentially identifies the articles developing a research domain (Khanra, Dhir, Parida, & Kohtamäki, 2021). Introduced by Brin and Page (1998), PageRank provides priority ranking of web pages based on a keyword search. The network analysis process for articles uses a similar concept to understand the relationships between articles. As an illustration, if an article A was cited by X_1, X_2, \dots, X_n articles, the PageRank of article A, i.e., $pr(A)$ in a network consisting of n articles is given by.

$$\text{pr}(A) = \frac{(1 - \alpha)}{n} + \alpha[\text{pr}(X_1)/c(X_1) + \text{pr}(X_2)/c(X_2) + \dots + \text{pr}(X_n)/c(X_n)]$$

where α is known as the damping factor, such that $\alpha \in [0,1]$ (Brin & Page, 1998) and $c(X_n)$ is the number of times that article X_n was cited (Fahimnia et al., 2015).

Table 6 presents the top 15 most prestigious articles on social media in sales based on their PageRank scores. Agnihotri is the leading author in the domain based on the PageRank score, and five papers authored by him are included in the top 15. Additionally, four of his papers are among the top five based on the PageRank score. The output from this analysis is different from the citation analysis in Table 5. Only one paper from the top five most prestigious articles was among the five most cited articles (Agnihotri et al., 2012). We find that prestige analysis provides a richer analysis.

7.2.2. Co-citation analysis of sales-based articles on social media (network analysis)

Co-citation is the frequency at which two articles are cited together, creating a semantic similarity that results in the formation of clusters of common knowledge (Kumar et al., 2020; Xu et al., 2018). Measuring semantic similarity using the modularity index has attracted increased attention from social network analysis researchers (e.g., Fahimnia et al., 2015; Khanra et al., 2021; Xu et al., 2018).

In Gephi, the modularity index is estimated based on the Louvain algorithm, which determines the optimal number of clusters or partitions that help in maximizing the index (Blondel, Guillaume, Lambiotte, & Lefebvre, 2008).

The modularity index (M) = $\frac{1}{2n} \sum_{ij} \left[W_{ij} - \frac{K_i K_j}{n} \right] \gamma(C_i, C_j)$, where W_{ij} is the weight of the edge linking the i^{th} article with the j^{th} article. $K_i = \sum_j W_{ij}$ is the sum of the weights assigned to node i and C_i denotes the community that relates to the vertex i . Here, $\gamma(C_i, C_j) = 1$ if the i^{th} article and the j^{th} article belong to the same cluster, otherwise it is equal to zero (Khanra et al., 2021).

Using the modularity option in Gephi, we identified a co-citation network connected to the articles in our database. The analysis resulted in three major clusters based on the Louvain algorithm that captured 82.75% of the nodes, i.e., 24 out of 29 SMSP articles from the co-citation network. Fig. 4 shows the visualization of the layered configuration of the nodes in three clusters with arcs between nodes. We present the articles in each cluster in Table 7, arranged based on their PageRank

score. The articles in a particular cluster represent a common theme, identified as “use of social media” (cluster 1 with nine articles), “performance” (cluster 2 with nine articles), and “framework” (cluster 3 with six articles).

7.2.2.1. Cluster 1: Use of social media. There are nine articles in this cluster. The major focus is the use of social media in sales and the selling process. Bocconcelli et al.'s (2017) study is ranked highest in this cluster based on the PageRank score.

Other papers in the cluster explore research on firm-level competence and commitment to social media as drivers of use (Guesalaga, 2016); the use of social media by key-account managers (Lacoste, 2016); the use of social media by business-to-business sales professionals and its effect on networks in the Chinese context (Niedermeier et al., 2016); social media usage by salespeople enhances buyers' trust and perceptions of integrity (Zhang & Li, 2019); and the use of blogs by salespeople in enhancing learning (Rollins, Nickell, & Wei, 2014). Additionally, Bocconcelli et al. (2017) examine the use of social media and the corresponding effect on the adoption of innovative selling processes; Enyinda, Opute, Fadahunsi, and Mbah (2020) study the prioritization of social media platforms and their use in the business-to-business sales process; Gáti et al. (2018) explore the effect of social media use and attitude on sales performance; and Nunan et al. (2018) highlight the importance of social media as a precursor of value generation in the selling process.

7.2.2.2. Cluster 2: Performance. The articles in this cluster focus on the impact of social media on sales performance. There are nine articles in this cluster, and the paper by Itani et al. (2017) is ranked the highest. The authors emphasize the role of the salesperson's orientation and attitude toward social media usefulness in determining social media usage, resulting in enhanced performance.

In addition, Rodriguez et al. (2016) examine the role of relationship-based performance and sales process capability as antecedents of sales performance in the context of social media use by salespeople. Agnihotri, Trainor, Itani, and Rodriguez (2017) focus on CRM technology and social media's combined effect in enhancing salespeople's service behaviors, leading to higher performance. Vieira et al. (2019) find that impressions generated through earned social media complement owned media, resulting in enhanced customer acquisition. Itani, Krush, Agnihotri, and Trainor (2020) determine that CRM and social media positively affect buyer–seller information exchanges. Agnihotri (2020) highlights the role of social media in enhancing the level of customer engagement. Guenzi and Nijssen (2020) explore the opportunities to use social media, peer effect, and firm-level support to motivate salespeople to integrate social media in their selling tasks, leading to higher sales growth. Chuang (2020) finds that customer co-creation through social media positively impacts operational agility and relational performance. Koponen and Rytty (2020), in exploring social interaction in online environments, suggest that these interactions might be interactive, affective, and focused on relationship maintenance.

7.2.2.3. Cluster 3: Framework. The theme of the articles in this cluster is frameworks in sales-based research on social media. This cluster includes six articles, and the paper by Bill et al. (2020) ranks the highest. These authors develop a framework based on the unified theory of acceptance and use of technology. It emphasizes the importance of social media in creating customer loyalty among high-status customers and

Table 6
Top 15 articles based on prestige analysis.

Sr. No.	Article	PageRank Score
1	Itani et al. (2017)	0.065114
2	Agnihotri et al. (2012)	0.061620
3	Agnihotri (2020)	0.060809
4	Agnihotri et al. (2017)	0.058802
5	Guenzi and Nijssen (2020)	0.055054
6	Bill et al. (2020)	0.054594
7	Bocconcelli et al. (2017)	0.054443
8	Lacoste (2016)	0.051417
9	Nunan et al. (2018)	0.050835
10	Gáti et al. (2018)	0.049755
11	Itani et al. (2020)	0.049310
12	Guesalaga (2016)	0.048183
13	Niedermeier et al. (2016)	0.046031
14	Zhang and Li (2019)	0.045501
15	Enyinda et al. (2020)	0.042827

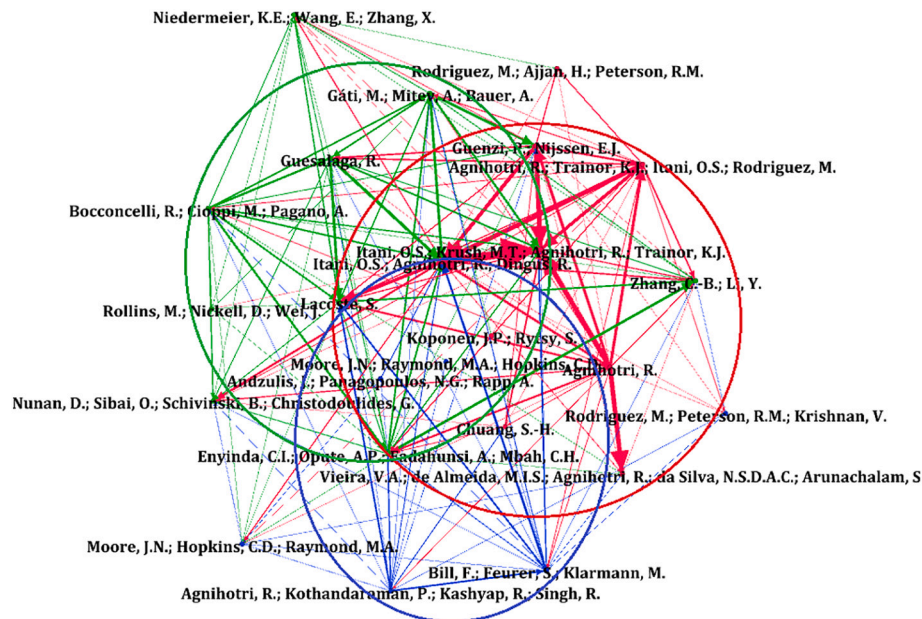


Fig. 4. Visualization of the layered configuration of the nodes in three clusters with arcs between nodes: Use of Social Media, Performance, and Framework.

Table 7
Details of the articles in each cluster based on their PageRank score.

Cluster 1			Cluster 2		Cluster 3	
Article	PageRank Score		Article	PageRank Score	Article	PageRank Score
1 Bocconcelli et al. (2017)	0.054443		Itani et al. (2017)	0.065114	Bill et al. (2020)	0.054594
2 Lacoste (2016)	0.051417		Agnihotri (2020)	0.060809	Agnihotri et al. (2012)	0.050835
3 Nunan et al. (2018)	0.050835		Agnihotri et al. (2017)	0.058802	Moore et al. (2013)	0.041250
4 Gáti et al. (2018)	0.049755		Guenzi and Nijssen (2020)	0.055054	Rodriguez et al. (2012)	0.025840
5 Guesalaga (2016)	0.048183		Itani et al. (2020)	0.049310	Andzulis et al. (2012)	0.014696
6 Niedermeier et al. (2016)	0.046031		Chuang (2020)	0.028662	Moore et al. (2015)	0.009334
7 Zhang and Li (2019)	0.045501		Vieira et al. (2019)	0.028383	–	–
8 Enyinda et al. (2020)	0.042827		Rodriguez et al. (2016)	0.020059	–	–
9 Rollins et al. (2014)	0.022843		Koponen and Rytty (2020)	0.014639	–	–

those with small buying centers. Agnihotri et al. (2012) propose a theoretical framework that addresses salespeople's use of social media to create value and achieve competitive goals. Rodriguez et al. (2012) develop and test a framework highlighting the role of social media in the selling process and corresponding sales performance. Andzulis et al. (2012) examine the challenges in using social media in sales and marketing interfaces and suggest that social media needs a strategy and framework at every stage of the sales process. Moore et al. (2013) and Moore et al. (2015) propose a framework for business-to-business practitioners' use of social media to target professionals, emphasizing social media's importance in the selling process.

Summary of our findings.

We conducted four analyses, addressing two areas. First, we conducted citation and prestige analyses to determine the impact of each article. We found the results to be dissimilar, and prestige analysis used more advanced PageRank analysis. Prestige analysis provided a deeper understanding of the important papers in the domain, as they commanded high PageRank scores. We also examined the classification of articles through text analysis (Leximancer) and network analysis (Gephi) and found similar clusters: usage, performance, and framework. The convergence substantiated the structure of research on social media

in sales and the selling process.

8. Directions for future research and summary

8.1. Directions for future research

8.1.1. Survey of academic researchers

One of the key objectives of this study was to develop directions for future research. Academic researchers in digital mediation in business-to-business marketing were surveyed as key informants because they actively read the literature. A list of authors who had published papers on digital mediation was searched for email addresses, and data were found for 237 researchers. We did not focus on social media researchers in sales as the sample would have been too small. A link to an online self-administered questionnaire was sent to those researchers, asking them to share possible research questions in the area of social media in business-to-business marketing. Two reminders were sent a week apart. Of the 237, eight emails bounced back, and four authors informed us that they were retired or were no longer active in the research area, leaving a final sample of 225. Forty-three completed surveys were received (44% from North America, 28% from Europe, and 28% from the Asia Pacific). 15% were from researchers with PhDs and other

Table 8
Directions for Future Research.

Area	Research Questions
Social Media Usage	<ul style="list-style-type: none"> • How do different sales strategies (sales and key account management) manage information flows? • What are the best approaches to using social media tools? • How much of salespeople's time should be focused on social media tools. • How does social selling impact the customer journey? • How do organizations develop effective and operationalizable strategies to control social media use by salespeople? • How should an organization align structures and processes to social media usage by salespeople?
Social Media Performance	<ul style="list-style-type: none"> • What social media metrics that can be used to evaluate the performance of selling through social media? • What is the impact of social media selling strategies on customer satisfaction and customers providing references? • How to model the linkages between social media engagement metrics and tangible financial performance in the selling process?
Social Media Framework	<ul style="list-style-type: none"> • What social media (e.g., platform) is relevant for social media selling? • What is the impact of media richness and information quality on social media selling? • What are the preferred social media tools for social media selling? • How do firms compare various social media tools and their impact on social media selling? • What is the impact of social media multi-platforms on the sales and selling process? • What are the most effective social media platforms during different stages of the selling process?

advanced degrees, 12.5% from assistant professors, 27.5% from associate professors, and 45% from full professors.

The responses from some researchers needed to be converted to research questions, as they provided only comments or brief sentences—we would have preferred a deeper description. We categorized the research questions into the three areas of research—usage, performance, and framework. Most proposed research questions were focused on the framework category. The future research questions discussed hereafter are based on the survey results and the extant literature on sales and social media. We provide a snapshot of future research questions in Table 8.

In the category of usage, three research questions focused on the development of new roles. The first research question explored how different sales strategies (sales and key-account management) manage information flows. The second question examined the best approaches to using social media tools, and the third question asked how salespeople's time should be utilized regarding social media tools. A research question focused on the customer journey and asked how selling through social media impacts the customer journey. Additionally, based on the extant literature, one important future research question is how organizations can develop effective and operationalizable policies to control social

media use by salespeople (Nunan et al., 2018). Another important area is aligning organizational structures and processes to social media usage by salespeople and customers (Agnihotri, 2020).

In the category of performance, research focused on efficacy and suggested two research questions. The first question focused on social media metrics that can be used to evaluate selling through social media. The second research question explored the impact of social media selling strategies on customer satisfaction and customers providing references. Nunan et al. (2018) suggest that the linkage between social media engagement metrics and tangible financial performance in the selling process needs to be modeled.

As stated earlier, the framework category elicited the highest number of research questions in two areas: tools and social media sales strategy. Some important questions on these aspects include:

- What social media (e.g., platform) is relevant for social media selling?
- What is the impact of media richness and information quality on social media selling?
- What are the preferred social media tools for social media selling?
- How do firms compare various social media tools and their impact on social media selling?

Nunan et al. (2018) also identify questions in the following research areas:

- What is the impact of social media multi-platforms on sales and the selling process?
- What are the most effective social media platforms during different stages of the selling process?

8.2. Summary

This paper presents a bibliometric analysis of the research on sales and social media in business-to-business markets. We first classified research in social media in business-to-business markets into four subject clusters: adoption of social media; use of social media in business-to-business marketing; social media and the selling process; and social media and marketing strategy. The area of interest, sales and social media, was an important subdomain in the broader literature. Our data visualization analysis discovers that although sales and social media was not a subdomain during 2009–13, it emerged as a subdomain during 2014–18 and remained a subdomain in 2019–20. Therefore, sales and social media continued to be an important area of research.

In the area of sales and social media, we found 29 SMSP articles that addressed research issues. We divided the literature into three areas: usage of social media, social media performance, and social media frameworks. We highlighted directions for future research and hope that this paper provides an impetus for such studies.

Appendix A. Social Media Trend Analysis and Research Profiling

We analyzed the literature using the article's title, the authors' name and affiliation, and publication dates. From January 2009 to December 2020, *Industrial Marketing Management* published 34 articles, the *Journal of Business and Industrial Marketing* published 18 articles, and the *Journal of Business-to-Business Marketing* and *European Journal of Marketing* each published 5 articles. As stated, 41 (35.65%) articles were published in 2019 and 2020, affirming researchers' increased attention to the subject. Also, *Industrial Marketing Management*, the most prominent journal in this area by a wide margin, publishes significant research on the subject.

A.1. Trend analysis

To examine the trend of social media research in business-to-business marketing, we categorized the articles into three time periods: 2009–2015 (36 articles), 2016–2018 (38 articles), and 2019–2020 (41 articles), based on an approximately equal distribution of the articles. In Fig. A1, we only

included journals that published two or more studies in a period, to enhance clarity. In all three periods, *Industrial Marketing Management* published the most articles. Also, as trend analysis shows, the largest number of articles (41) appeared from 2019 through December 2020, indicating increasing researcher interest in the subject.

A.2. Research profiling

One of the goals of the analysis was to illustrate the impact of authors and institutions on social media research in business-to-business marketing. Following Canabal and White III (2008), Martín-Martín, Orduna-Malea, and Delgado López-Cózar (2018), and Kumar et al. (2020), we undertook a research-profiling methodology that illustrates the authors' details, relevant metrics, and related impactful journals. We calculated the number of publications, citation count, and citation rate, to understand the impact. Average citations per year—the total number of citations divided by the number of years since publication—represent the article's impact over time (Yan & Ding, 2010). We used three weighted measures—articles, number of citations, and number of citations per year—to assess author and institution impact. If multiple authors co-authored a paper, the weighted counts are proportional, based on the number of authors—e.g., three co-authors would each have contributed one-third. For each author and institution, we summed the weighted counts (e.g., Chan, Lai, & Liano, 2012). These procedures enabled highlighting the most impactful journals and articles, and the institutions researching social media in business-to-business marketing. We followed the Kumar et al. (2020) suggestions of formulae for the calculations.

A.2.1. Results of research profiling

We first assessed the impact of journals by examining the number of articles published and the number of citations for each journal, then summing the total number of citations for all the papers on social media in business-to-business marketing published in that journal. Table A1 presents the list of the top 10 (out of 40) journals that published articles on social media in business-to-business markets. *Industrial Marketing Management* emerged as the highest-ranked journal for both articles published and citations.

Next, following Kumar et al. (2020), we assessed 273 authors' impact by examining three weighted attributes—articles, citation count, and citation count per year. Tables 2 and 3 present the most impactful authors, and the authors common to the three assessments are Agnihotri, Michaelidou, and Swani. To understand the contribution of 162 institutions associated with 273 authors' affiliations, we evaluated the relevant weighted metrics—the number of articles and citations. Table A4 presents the most impactful institutions. We found that the University of Jyväskylä, Finland, Tampere University of Technology, University of Massachusetts, University of Birmingham, United Kingdom, and the University of Alabama are on both lists.

We evaluated the total number of citations of an article, which reflects its impact on the field of research. A bias could arise from recent articles having fewer citations and older articles, more citations, correlating with the amount of time they are available. Following the Kumar et al. (2020) corrective, we calculated citations per year. To understand the articles' overall impact, we assessed all 115 articles using the number of citations and citations per year, presenting articles with the most citations in Table A2 and the most citations per year in Table A3.

Industrial Marketing Management published 9 of the 15 most impactful articles, based on average citations per year. The total citation count favored older articles, as Table A2 shows. Therefore, the average citations per year even provided an opportunity for newer articles to take a place in the list, as Table A3 shows. We found 12 articles on both lists: Michaelidou et al. (2011), Trainor et al. (2014), Rapp et al. (2013), Andzulis et al. (2012), Agnihotri et al. (2016), Agnihotri et al. (2012), Rodriguez et al. (2012), Jussila et al. (2014), Siamagka et al. (2015), Swani et al. (2014), Wang, Pauleen, and Zhang (2016), and Guesalaga (2016).

A.3. Bibliographic coupling

We also examined the literature using bibliographic coupling, highlighting the prominence of journals by linking articles that cite the same set of references. Bibliographic coupling also provides a mapping of the related journals based on co-citations. We used VOSviewer, bibliometric analysis software, to investigate the bibliometric coupling (e.g., Kumar et al., 2020; Valenzuela, Merigó, Johnston, Nicolas, & Jaramillo, 2017). Using the software, we provide in Fig. A2 graphical representation of the prominent journals publishing on the subject.

The circle size in the graphical representation represents the journal's importance, based on citations. For instance, the most prominent and important journal in the area is *Industrial Marketing Management*; another important one is the *Journal of Business and Industrial Marketing*. The circles' color is also significant, indicating the journal clusters and showing the citation frequency of articles in the cluster journals. Additionally, the closeness of the circles shows journals having similar citations. So, the closeness of *Industrial Marketing Management* and the *Journal of Business and Industrial Marketing* suggests that articles in both journals cited the same articles.

Table A1

Impact of Journals					
Journal	Publication Rank	Articles (Number)	Articles (Percentage)	Citation Rank	Number of Citations
IMM	1	34	29.56%	1	3613
JBIM	2	19	16.52%	4	602
JBBM	3	5	4.34%		
EJM	4	5	4.34%		
JBR	5	5	4.34%	3	834
JMM	6	3	2.61%		

(continued on next page)

Table A1 (continued)

Impact of Journals					
Journal	Publication Rank	Articles (Number)	Articles (Percentage)	Citation Rank	Number of Citations
JMTP	6	3	2.61%	10	99
JPSSM	6	3	2.61%	2	1050
JAMS	6	3	2.61%	5	498
MMJ				6	289
JRIM				7	260
CHB				8	248
JCB				9	231

List of Major Journals	
Name	Abbreviation
Computers in Human Behavior	CHB
European Journal of Marketing	EJM
Industrial Marketing Management	IMM
Journal of the Academy of Marketing Science	JAMS
Journal of Business & Industrial Marketing	JBIM
Journal of Business Research	JBR
Journal of Business to Business Marketing	JBBM
Journal of Customer Behavior	JCB
Journal of Internet Commerce	JIC
Journal of Marketing Management	JMM
Journal of Marketing Theory and Practice	JMTP
Journal of Personal Selling & Sales Management	JPSSM
Journal of Research in Interactive Marketing	JRIM
Marketing Management Journal	MMJ

Table A2

Top 15 Articles (Number of Citations).

Rank	Article	Number of Citations	Journal
1	Michaelidou, N., Siamagka, N. T., & Christodoulides, G. (2011). Usage, barriers and measurement of social media marketing: An exploratory investigation of small and medium B2B brands. <i>Industrial Marketing Management</i> , 40(7), 1153–1159.	1122	IMM
2	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. <i>Journal of Business Research</i> , 67(6), 1201–1208.	639	JBR
3	Rapp, A., Beitelspacher, L. S., Grewal, D., & Hughes, D. E. (2013). Understanding social media effects across seller, retailer, and consumer interactions. <i>Journal of The Academy of Marketing Science</i> , 41(5), 547–566.	483	JAMS
4	Andzulis, J. M., Panagopoulos, N. G., & Rapp, A. (2012). A review of social media and implications for the sales process. <i>Journal of Personal Selling & Sales Management</i> , 32(3), 305–316.	460	JPSSM
5	Agnihotri, R., Dingus, R., Hu, M. Y., & Krush, M. T. (2016). Social media: Influencing customer satisfaction in B2B sales. <i>Industrial Marketing Management</i> , 53, 172–180.	398	IMM
6	Agnihotri, R., Kothandaraman, P., Kashyap, R., & Singh, R. (2012). Bringing “social” into sales: The impact of salespeople's social media use on service behaviors and value creation. <i>Journal of Personal Selling & Sales Management</i> , 32(3), 333–348.	298	JPSSM
7	Rodriguez, M., Peterson, R. M., & Krishnan, V. (2012). Social media's influence on business-to-business sales performance. <i>Journal of Personal Selling & Sales Management</i> , 32(3), 365–378.	292	JPSSM
8	Jussila, J. J., Kärkkäinen, H., & Aramo-Immonen, H. (2014). Social media utilization in business-to-business relationships of technology industry firms. <i>Computers in Human Behavior</i> , 30, 606–613.	248	CHB
9	Siamagka, N. T., Christodoulides, G., Michaelidou, N., & Valvi, A. (2015). Determinants of social media adoption by B2B organizations. <i>Industrial Marketing Management</i> , 51, 89–99.	230	IMM
10	Swani, K., Milne, G., & Brown, B. P. (2013). Spreading the word through likes on Facebook. <i>Journal of Research in Interactive Marketing</i> , 7(4), 269–294.	218	JRIM
11	Järvinen, J., Tollinen, A., Karjaluoto, H., & Jayawardhena, C. (2012). Digital and social media marketing usage in B2B industrial section. <i>Marketing Management Journal</i> , 22(2), 102–117.	212	MMJ
12	Swani, K., Brown, B. P., & Milne, G. R. (2014). Should tweets differ for B2B and B2C? An analysis of Fortune 500 companies' Twitter communications. <i>Industrial marketing management</i> , 43(5), 873–881.	210	IMM
13	Brennan, R., & Croft, R. (2012). The use of social media in B2B marketing and branding: An exploratory study. <i>Journal of Customer Behavior</i> , 11(2), 101–115.	197	JCB
14	Wang, W. Y., Pauleen, D. J., & Zhang, T. (2016). How social media applications affect B2B communication and improve business performance in SMEs. <i>Industrial Marketing Management</i> , 54, 4–14.	164	IMM
15	Guesalaga, R. (2016). The use of social media in sales: Individual and organizational antecedents, and the role of customer engagement in social media. <i>Industrial Marketing Management</i> , 54, 71–79.	163	IMM

Table A3

Top 15 Articles (Citations per Year).

Rank	Article	Citations per Year	Journal
1	Michaelidou, N., Siamagka, N. T., & Christodoulides, G. (2011). Usage, barriers and measurement of social media marketing: An exploratory investigation of small and medium B2B brands. <i>Industrial Marketing Management</i> , 40(7), 1153–1159.	124.67	IMM
2	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. <i>Journal of Business Research</i> , 67(6), 1201–1208.	106.50	JBR
3	Agnihotri, R., Dingus, R., Hu, M. Y., & Krush, M. T. (2016). Social media: Influencing customer satisfaction in B2B sales. <i>Industrial Marketing Management</i> , 53, 172–180.	99.50	IMM
4	Iankova, S., Davies, I., Archer-Brown, C., Marder, B., & Yau, A. (2019). A comparison of social media marketing between B2B, B2C and mixed business models. <i>Industrial Marketing Management</i> , 81, 169–179.	90.00	IMM
5	Rapp, A., Beitelspacher, L. S., Grewal, D., & Hughes, D. E. (2013). Understanding social media effects across seller, retailer, and consumer interactions. <i>Journal of The Academy of Marketing Science</i> , 41(5), 547–566.	69.00	JAMS
6	Andzulis, J. M., Panagopoulos, N. G., & Rapp, A. (2012). A review of social media and implications for the sales process. <i>Journal of Personal Selling & Sales Management</i> , 32(3), 305–316.	57.50	JPSSM
7	Swani, K., Milne, G. R., Brown, B. P., Assaf, A. G., & Donthu, N. (2017). What messages to post? Evaluating the popularity of social media communications in business versus consumer markets. <i>Industrial Marketing Management</i> , 62, 77–87.	48.33	IMM
8	Siamagka, N. T., Christodoulides, G., Michaelidou, N., & Valvi, A. (2015). Determinants of social media adoption by B2B organizations. <i>Industrial Marketing Management</i> , 51, 89–99.	46.00	IMM
9	Jussila, J. J., Kärkkäinen, H., & Aramo-Immonen, H. (2014). Social media utilization in business-to-business relationships of technology industry firms. <i>Computers in Human Behavior</i> , 30, 606–613.	41.33	CHB
10	Wang, W. Y., Pauleen, D. J., & Zhang, T. (2016). How social media applications affect B2B communication and improve business performance in SMEs. <i>Industrial Marketing Management</i> , 54, 4–14.	41.00	IMM
11	Guesalaga, R. (2016). The use of social media in sales: Individual and organizational antecedents, and the role of customer engagement in social media. <i>Industrial Marketing Management</i> , 54, 71–79.	40.75	IMM
12	Agnihotri, R., Kothandaraman, P., Kashyap, R., & Singh, R. (2012). Bringing “social” into sales: The impact of salespeople's social media use on service behaviors and value creation. <i>Journal of Personal Selling & Sales Management</i> , 32(3), 333–348.	37.25	JPSSM
13	Rodríguez, M., Peterson, R. M., & Krishnan, V. (2012). Social media's influence on business-to-business sales performance. <i>Journal of Personal Selling & Sales Management</i> , 32(3), 365–378.	36.50	JPSSM
14	Swani, K., Brown, B. P., & Milne, G. R. (2014). Should tweets differ for B2B and B2C? An analysis of Fortune 500 companies' Twitter communications. <i>Industrial marketing management</i> , 43(5), 873–881.	35.00	IMM
15	Hollebeek, L. D. (2019). Developing business customer engagement through social media engagement-platforms: an integrative SD logic/RBV-informed model. <i>Industrial Marketing Management</i> , 81, 89–98.	33.00	IMM

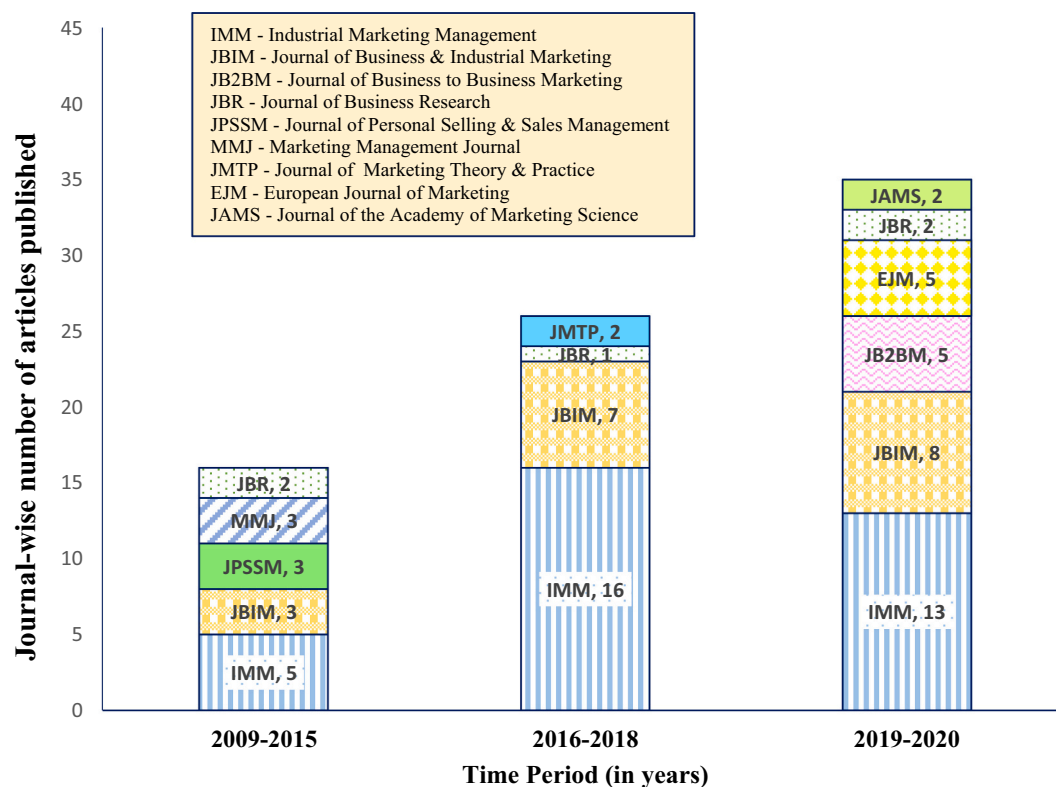
Table A4

Author and Institution Impact (Weighted).

Rank	Author	Weighted number of articles	Rank	Author	Total weighted citations	Rank	Author	Weighted citations per year
1	Agnihotri, R.	2.833	1	Christodoulides, G.	437.5	1	Agnihotri, R.	290.8
2	Karjaluto, H.	1.867	2	Rapp, A.	433.8	2	Rapp, A.	233.0
3	Jussila, J. J.	1.167	3	Michaelidou, N.	431.5	3	Christodoulides, G.	182.7
4	Kärkkäinen, H.	1.167	4	Siamagka, N. T.	431.5	4	Michaelidou, N.	170.7
5	Bernard, M.	1.000	5	Agnihotri, R.	386.9	5	Siamagka, N. T.	170.7
6	Brennan, R.	1.000	6	Andzulis, J. M.	313.1	6	Andzulis, J. M.	164.0
7	Brink, T.	1.000	7	Brown, B. P.	171.7	7	Dingus, R.	125.2
8	Chuang, S. H.	1.000	8	Swani, K.	171.7	8	Trainor, K. J.	116.4
9	Croft, R.	1.000	9	Karjaluto, H.	165.9	9	Brown, B. P.	114.5
10	Guesalaga, R.	1.000	10	Guesalaga, R.	163.0	10	Swani, K.	114.5

Rank	Institution	Weighted number of Articles	Rank	Institution	Weighted Citations
1	University of Jyväskylä, Jyväskylä, Finland	3.250	1	University of Birmingham, United Kingdom	771.3
2	Tampere University of Technology, Tampere	3.000	2	University of Alabama, Tuscaloosa, USA	746.9
3	University, Clemson, South Carolina, USA	2.000	3	Tampere University of Technology, Tampere	417.0
4	Northern Illinois University	1.750	4	University of Reading, United Kingdom	374.0
5	Carleton University, Ottawa, Canada	1.667	5	University of Massachusetts, Massachusetts, USA	273.3
6	University of Bradford, Bradford, United Kingdom	1.584	6	University of Jyväskylä, Jyväskylä, Finland	236.3
7	University of London, London, United Kingdom	1.500	7	Northern Illinois University	219.3
8	University of Alabama, Tuscaloosa, USA	1.417	8	Northern Arizona University, United States	184.3
9	University of Massachusetts, Massachusetts, USA	1.400	9	Universidad Católica, Macul, Santiago, Chile	163.0
10	University of Birmingham, United Kingdom	1.334	10	University of Virginia, Darden School of Business	159.8

Number of journal articles across three time periods



Trend analysis

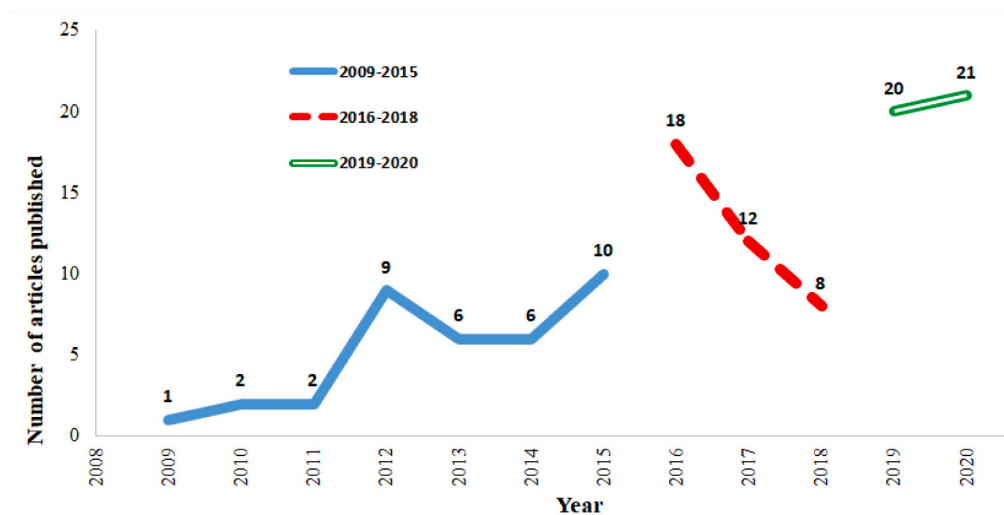


Fig. A1. Number of journal articles across three time periods.

A.4. Trend analysis



Fig. A2. Prominent journals highlighted by bibliometric coupling.

Appendix B. Formulae to calculate impact of articles, impact of authors and impact of Institutions

Impact of Articles Based on Citations per Year

$$\text{Citations per Year} = \frac{\text{Total Citations}}{\text{Base Year} - \text{Publication Year}}$$

Here Base Year is 2020.

Impact of Authors

$$\text{Author – wise weighted number of articles} = \sum_{k=1}^n \left(\frac{1}{\text{Number of authors}} \right)$$

where k = number of articles by an author under discussion.

$$\text{Author – wise weighted total citation} = \sum_{k=1}^n \left(\frac{\text{Citation of the article}}{\text{Number of authors}} \right)$$

where k = number of articles by an author under discussion.

$$\text{Author – wise weighted citation per year} = \sum_{k=1}^n \left[\left(\frac{\text{Citation of the article}}{\text{Number of authors}} \right) \times \left(\frac{1}{\text{BY} - \text{PY}} \right) \right]$$

where k = number of articles by an author under discussion.

Here Base Year is 2020.

Impact of Institutions

$$\text{Institution – wise weighted number of articles} = \sum_{k=1}^n \left(\frac{\text{Number of authors from the Institution under consideration}}{\text{Total number of authors in the article}} \right)$$

where k = number of articles from the institution under consideration.

$$\begin{aligned} \text{Institution – wise weighted citations} &= \sum_{k=1}^n \left(\frac{\text{Citation of the article} \times \text{Number of authors from the institution under consideration}}{\text{Total number of authors in the article}} \right) \\ &= \sum_{k=1}^n \left(\frac{\text{Citation of the article} \times \text{Number of authors from the institution under consideration}}{\text{Total number of authors}} \right) \end{aligned}$$

where k = number of articles from the institution under discussion.

(Source: Adapted from Kumar et al., 2020)

References*

- *Agnihotri. (2020). Social media, customer engagement, and sales organizations: A research agenda. *Industrial Marketing Management*, 90(2020), 291–299.
- *Agnihotri, R., Dingus, R., Hu, M. Y., & Krush, M. T. (2016). Social media: Influencing customer satisfaction in B2B sales. *Industrial Marketing Management*, 53, 172–180.
- *Agnihotri, R., Kothandaraman, P., Kashyap, R., & Singh, R. (2012). Bringing “social” into sales: The impact of salespeople’s social media use on service behaviors and value creation. *Journal of Personal Selling & Sales Management*, 32(3), 333–348.
- *Agnihotri, R., Trainor, K. J., Itani, O. S., & Rodriguez, M. (2017). Examining the role of sales-based CRM technology and social media use on post-sale service behaviors in India. *Journal of Business Research*, 81, 144–154.
- *Ancillai, C., Terho, H., Cardinali, S., & Pascucci, F. (2019). Advancing social media driven sales research: Establishing conceptual foundations for B-to-B social selling. *Industrial Marketing Management*, 82, 293–308.
- *Andzulis, J. M., Panagopoulos, N. G., & Rapp, A. (2012). A review of social media and implications for the sales process. *Journal of Personal Selling & Sales Management*, 32(3), 305–316.
- Arnott, D. C. (2007). Research on trust: A bibliography and brief bibliometric analysis of the special issue submissions. *European Journal of Marketing*, 41(9/10), 1203–1240.
- *Bianchi, C., & Andrews, L. (2015). Investigating marketing managers’ perspectives on social media in Chile. *Journal of Business Research*, 68(12), 2552–2559.
- Biesenthal, C., & Wilden, R. (2014). Multi-level project governance: Trends and opportunities. *International journal of project management*, 32(8), 1291–1308.
- *Bill, F., Feurer, S., & Klarmann, M. (2020). Salesperson social media use in business-to-business relationships: An empirical test of an integrative framework linking antecedents and consequences. *Journal of the Academy of Marketing Science*, 48, 734–752.
- Blondel, V. D., Guillaume, J. L., Lambiotte, R., & Lefebvre, E. (2008). Fast unfolding of communities in large networks. *Journal of Statistical Mechanics: Theory and Experiment*, 2008, Article P10008.
- *Bocconcelli, R., Cioppi, M., & Pagano, A. (2017). Social media as a resource in SMEs’ sales process. *Journal of Business & Industrial Marketing*, 32(5), 693–709.
- *Brennan, R., & Croft, R. (2012). The use of social media in B2B marketing and branding: An exploratory study. *Journal of Customer Behaviour*, 11(2), 101–115.
- Brin, S., & Page, L. (1998). The anatomy of a large-scale hypertextual web search engine. *Computer networks and ISDN systems*, 30(1–7), 107–117.
- *Brink, T. (2017). B2B SME management of antecedents to the application of social media. *Industrial Marketing Management*, 64, 57–65.
- *Broekemier, G., Chau, N. N., & Seshadri, S. (2015). Social media practices among small business-to-business enterprises. *Small Business Institute Journal*, 11(1).
- Campbell, C., Pitt, L. F., Parent, M., & Berthon, P. R. (2011). Understanding consumer conversations around ads in a Web 2.0 world. *Journal of Advertising*, 40(1), 87–102.
- Canabal, A., & White, G. O., III (2008). Entry mode research: Past and future. *International Business Review*, 17(3), 267–284.
- *Cawsey, T., & Rowley, J. (2016). Social media brand building strategies in B2B companies. *Marketing Intelligence & Planning*, 34(6), 754–776.
- Chan, K. C., Lai, P., & Liano, K. (2012). A threshold citation analysis in marketing research. *European Journal of Marketing*, 46(1/2), 134–156.
- *Chuang, S. H. (2020). Co-creating social media agility to build strong customer-firm relationships. *Industrial Marketing Management*, 84, 202–211.
- Dagnino, G. B., Levanti, G., Minà, A., & Picone, P. M. (2015). Interorganizational network and innovation: A bibliometric study and proposed research agenda. *Journal of Business & Industrial Marketing*, 30(3/4), 354–377.
- Dillon, W. R., & Goldstein, M. (1984). *Multivariate analysis: Methods and applications*. New York: John Wiley & Sons.
- *Dwivedi, Y. K., Ismagilova, E., Rana, N. P., & Weerakkody, V. (2019). Use of Social Media by b2b Companies: Systematic Literature Review and Suggestions for Future Research. In I. Pappas, P. Mikalef, Y. Dwivedi, L. Jaccheri, J. Krogstie, & M. Mäntymäki (Eds.), vol 11701. *Digital Transformation for a Sustainable Society in the 21st Century. I3E 2019. Lecture Notes in Computer Science*. Cham: Springer.
- *Enyinda, C. I., Opute, A. P., Fadahunsi, A., & Mbah, C. H. (2020). Marketing-sales-service interface and social media marketing influence on B2B sales process. *Journal of Business & Industrial Marketing*, 36(6), 990–1009.
- Fahimnia, B., Sarkis, J., & Davarzani, H. (2015). Green supply chain management: A review and bibliometric analysis. *International Journal of Production Economics*, 162, 101–114.
- *Foltean, F. S., Trif, S. M., & Tuleu, D. L. (2019). Customer relationship management capabilities and social media technology use: Consequences on firm performance. *Journal of Business Research*, 104, 563–575.
- Garofalo, J. (2016). *5 statistics that will change your view of the B2B Buyer’s journey*. IDG. Retrieved from <https://www.idg.com/5-statistics-will-change-view-b2b-buyers-journey/>.
- *Gāti, M., Mitev, A., & Bauer, A. (2018). Investigating the impact of salesperson’s use of technology and social media in their customer relationship performance in B2B settings. *Trziste Market*, 30(2), 165–176.
- Gavin, R., Harrison, L., Plotkin, C. L., Spillecke, D., & Stanley, J. (2020). The B2B digital inflection point: How sales have changed during COVID-19. *McKinsey & Company report*. Retrieved from <https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/the-b2b-digital-inflection-point-how-sales-have-changed-during-covid-19>.
- *Groza, M., Peterson, R., Sullivan, U. Y., & Krishnan, V. (2012). Social media and the sales force: The importance of intra-organizational cooperation and training on performance. *The Marketing Management Journal*, 22(2), 118–130.
- *Guenzi, P., & Nijssen, E. J. (2020). Studying the antecedents and outcome of social media use by salespeople using a MOA framework. *Industrial Marketing Management*, 90, 346–359.
- *Guesalaga, R. (2016). The use of social media in sales: Individual and organizational antecedents, and the role of customer engagement in social media. *Industrial Marketing Management*, 54, 71–79.
- *Habibi, F., Hamilton, C. A., Valos, M. J., & Callaghan, M. (2015). E-marketing orientation and social media implementation in B2B marketing. *European Business Review*, 27(6), 638–655.
- Harzing, A. W., & Alakangas, S. (2016). Google scholar, Scopus and the web of science: A longitudinal and cross-disciplinary comparison. *Scientometrics*, 106(2), 787–804.
- *Hollebeek, L. D. (2019). Developing business customer engagement through social media engagement-platforms: An integrative SD logic/RBV-informed model. *Industrial Marketing Management*, 81, 89–98.
- Huotari, L., Ulkuniemi, P., Saraniemi, S., & Mäläskä, M. (2015). Analysis of content creation in social media by B2B companies. *Journal of Business & Industrial Marketing*, 30(6), 761–770.
- *Iankova, S., Davies, I., Archer-Brown, C., Marder, B., & Yau, A. (2019). A comparison of social media marketing between B2B, B2C and mixed business models. *Industrial Marketing Management*, 81, 169–179.
- *Itani, O. S., Agnihotri, R., & Dingus, R. (2017). Social media use in B2b sales and its impact on competitive intelligence collection and adaptive selling: Examining the role of learning orientation as an enabler. *Industrial Marketing Management*, 66, 64–79.
- *Itani, O. S., Krush, M. T., Agnihotri, R., & Trainor, K. J. (2020). Social media and customer relationship management technologies: Influencing buyer-seller information exchanges. *Industrial Marketing Management*, 90, 264–275.
- Jacomy, M., Venturini, T., Heymann, S., & Bastian, M. (2014). ForceAtlas2, a continuous graph layout algorithm for handy network visualization designed for the Gephi software. *PLoS One*, 9(6), Article e98679.
- *Jussila, J. J., Kärkkäinen, H., & Aramo-Immonen, H. (2014). Social media utilization in business-to-business relationships of technology industry firms. *Computers in Human Behavior*, 30, 606–613.
- Karjaluoto, H., & Kuivalainen, O. (2015). Antecedents of social media B2B use in industrial marketing context: customers’ view. *Journal of Business & Industrial Marketing*, 30(6), 711–722.
- *Kärkkäinen, H., Jussila, J., & Väisänen, J. (2010). Social media use and potential in business-to-business companies’ innovation. In *Proceedings of The 14th International Academic Mindtrek Conference: Envisioning Future Media Environments* (pp. 228–236).
- *Keegan, B. J., & Rowley, J. (2017). Evaluation and decision making in social media marketing. *Management Decision*, 55(1), 15–31.
- Khanra, S., Dhir, A., Parida, V., & Kohtamäki, M. (2021). Servitization research: A review and bibliometric analysis of past achievements and future promises. *Journal of Business Research*, 131, 151–166.
- *Koponen, J. P., & Rytty, S. (2020). Social presence and e-commerce B2B chat functions. *European Journal of Marketing*, 54(6), 1205–1224.
- *Kumar, B., Sharma, A., Vatavwala, S., & Kumar, P. (2020). Digital mediation in business-to-business marketing: A bibliometric analysis. *Industrial Marketing Management*, 85, 126–140.
- Kumar, P., Sharma, A., & Salo, J. (2019). A bibliometric analysis of extended key account management literature. *Industrial Marketing Management*, 82, 276–292.
- *Lacka, E., & Chong, A. (2016). Usability perspective on social media sites’ adoption in the B2B context. *Industrial Marketing Management*, 54, 80–91.
- *Lacoste, S. (2016). Perspectives on social media and its use by key account managers. *Industrial Marketing Management*, 54, 33–43.
- Marion, L. S., & McCain, K. W. (2001). Contrasting views of software engineering journals: Author citation choices and indexer vocabulary assignments. *Journal of the American Society for Information Science and Technology*, 52(4), 297–308.
- Martinez-López, F. J., Merigó, J. M., Gázquez-Abad, J. C., & Ruiz-Real, J. L. (2020). Industrial marketing management: Bibliometric overview since its foundation. *Industrial Marketing Management*, 84, 19–38.
- Martin-Martín, A., Orduna-Malea, E., & Delgado López-Cózar, E. (2018). A novel method for depicting academic disciplines through Google scholar citations: The case of Bibliometrics. *Scientometrics*, 114(3), 1251–1273.
- McCain, K. W. (1986). Cocited author mapping as a valid representation of intellectual structure. *Journal of the American Society for Information Science*, 37(3), 111–122.
- McCain, K. W. (1990). Mapping authors in intellectual space: A technical overview. *Journal of the American Society for Information Science*, 41(6) (433).
- Merigó, J. M., Mas-Tur, A., Roig-Tierno, N., & Ribeiro-Soriano, D. (2015). A bibliometric overview of the journal of business research between 1973 and 2014. *Journal of Business Research*, 68(12), 2645–2653.
- *Michaelidou, N., Siamagka, N. T., & Christodoulides, G. (2011). Usage, barriers and measurement of social media marketing: An exploratory investigation of small and medium B2B brands. *Industrial Marketing Management*, 40(7), 1153–1159.
- *Moore, J. N., Hopkins, C. D., & Raymond, M. A. (2013). Utilization of relationship-oriented social media in the selling process: A comparison of consumer (B2C) and industrial (B2B) salespeople. *Journal of Internet Commerce*, 12(1), 48–75.
- *Moore, J. N., Raymond, M. A., & Hopkins, C. D. (2015). Social selling: A comparison of social media usage across process stage, markets, and sales job functions. *Journal of Marketing Theory and Practice*, 23(1), 1–20.
- Nerur, S. P., Rasheed, A. A., & Natarajan, V. (2008). The intellectual structure of the strategic management field: An author co-citation analysis. *Strategic Management Journal*, 29(3), 319–336.

* These studies were included in the bibliometric analysis

- *Nguyen, B., Yu, X., Melewar, T. C., & Chen, J. (2015). Brand innovation and social media: Knowledge acquisition from social media, market orientation, and the moderating role of social media strategic capability. *Industrial Marketing Management*, 51, 11–25.
- *Niedermeier, K. E., Wang, E., & Zhang, X. (2016). The use of social media among business-to-business sales professionals in China. *Journal of Research in Interactive Marketing*, 10(1), 33–49.
- *Nunan, D., Sibai, O., Schivinski, B., & Christodoulides, G. (2018). Reflections on “social media: Influencing customer satisfaction in B2B sales” and a research agenda. *Industrial Marketing Management*, 75, 31–36.
- *Pascucci, F., Ancillai, C., & Cardinali, S. (2018). Exploring antecedents of social media usage in B2B: A systematic review. *Management Research Review*, 41(6), 629–656.
- Pulizzi, J., & Handley, A. (2017). B2B content marketing: 2017 benchmarks, budgets, and trends - North America. Content marketing institute. Retrieved from https://contentmarketinginstitute.com/wp-content/uploads/2016/09/2017_B2B_Research_FINAL.pdf.
- *Quinton, S., & Wilson, D. (2016). Tensions and ties in social media networks: Towards a model of understanding business relationship development and business performance enhancement through the use of LinkedIn. *Industrial Marketing Management*, 54, 15–24.
- Randhawa, K., Wilden, R., & Hohberger, J. (2016). A bibliometric review of open innovation: Setting a research agenda. *Journal of Product Innovation Management*, 33(6), 750–772.
- *Rapp, A., Beitelbacher, L. S., Grewal, D., & Hughes, D. E. (2013). Understanding social media effects across seller, retailer, and consumer interactions. *Journal of the Academy of Marketing Science*, 41(5), 547–566.
- *Rodriguez, M., Ajjan, H., & Peterson, R. M. (2016). Social media in large sales forces: An empirical study of the impact of sales process capability and relationship performance. *Journal of Marketing Theory and Practice*, 24(3), 365–379.
- *Rodriguez, M., Peterson, R. M., & Krishnan, V. (2012). Social media's influence on business-to-business sales performance. *Journal of Personal Selling & Sales Management*, 32(3), 365–378.
- *Rollins, M., Nickell, D., & Wei, J. (2014). Understanding salespeople's learning experiences through blogging: A social learning approach. *Industrial Marketing Management*, 43(6), 1063–1069.
- *Salo, J. (2017). Social media research in the industrial marketing field: Review of literature and future research directions. *Industrial Marketing Management*, 66, 115–129.
- Samiee, S., & Chabowski, B. R. (2012). Knowledge structure in international marketing: A multi-method bibliometric analysis. *Journal of the Academy of Marketing Science*, 40(2), 364–386.
- *Schultz, R. J., Schwepker, C. H., & Good, D. J. (2012a). An exploratory study of social media in business-to-business selling: Salesperson characteristics, activities and performance. *Marketing Management Journal*, 22(2), 76–89.
- *Schultz, R. J., Schwepker, C. H., & Good, D. J. (2012b). Social media usage: An investigation of B2B salespeople. *American Journal of Business*, 27(2), 174–194.
- *Shaltoni, A. M. (2017). From websites to social media: Exploring the adoption of internet marketing in emerging industrial markets. *Journal of Business & Industrial Marketing*, 32(7), 1009–1019.
- *Siamagka, N. T., Christodoulides, G., Michaelidou, N., & Valvi, A. (2015). Determinants of social media adoption by B2B organizations. *Industrial Marketing Management*, 51, 89–99.
- *Singaraju, S. P., Nguyen, Q. A., Niininen, O., & Sullivan-Mort, G. (2016). Social media and value co-creation in multi-stakeholder systems: A resource integration approach. *Industrial Marketing Management*, 54, 44–55.
- Small, H. (1973). Co-citation in the scientific literature: A new measure of the relationship between two documents. *Journal of the American Society for Information Science*, 24(4), 265–269.
- Smith, A. E., & Humphreys, M. S. (2006). Evaluation of unsupervised semantic mapping of natural language with Leximancer concept mapping. *Behavior research methods*, 38(2), 262–279.
- Stevens, M. E., Giuliano, V. E., Heilprin, L. B., & Heilprin, L. R. (1965). *Statistical association methods for mechanized documentation: Symposium proceedings* (Vol. 269). US Government Printing Office.
- *Swani, K., Brown, B. P., & Milne, G. R. (2014). Should tweets differ for B2B and B2C? An analysis of fortune 500 companies' twitter communications. *Industrial Marketing Management*, 43(5), 873–881.
- *Swani, K., Milne, G., & Brown, B. P. (2013). Spreading the word through likes on Facebook. *Journal of Research in Interactive Marketing*, 7(4), 269–294.
- *Swani, K., Milne, G. R., Brown, B. P., Assaf, A. G., & Donthu, N. (2017). What messages to post? Evaluating the popularity of social media communications in business versus consumer markets. *Industrial Marketing Management*, 62, 77–87.
- *Taneja, S., & Toombs, L. (2014). Putting a face on small businesses: Visibility, viability, and sustainability the impact of social media on small business marketing. *Academy of marketing studies journal*, 18(1), 249.
- *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.
- Tran, B. X., Latkin, C. A., Vu, G. T., Nguyen, H. L. T., Nghiem, S., Tan, M. X., & Ho, R. (2019). The current research landscape of the application of artificial intelligence in managing cerebrovascular and heart diseases: A bibliometric and content analysis. *International Journal of Environmental Research and Public Health*, 16(15), 2699.
- Tsay, M. Y., Shen, T. M., & Liang, M. H. (2016). A comparison of citation distributions of journals and books on the topic “information society”. *Scientometrics*, 106(2), 475–508.
- Valenzuela, L. M., Merigó, J. M., Johnston, W. J., Nicolas, C., & Jaramillo, J. F. (2017). Thirty years of the Journal of Business & Industrial Marketing: A bibliometric analysis. *Journal of Business & Industrial Marketing*, 32910, 1–18.
- *Veldeman, C., Van Praet, E., & Mechant, P. (2017). Social media adoption in business-to-business: IT and industrial companies compared. *International Journal of Business Communication*, 54(3), 283–305.
- *Vieira, V. A., de Almeida, M. I. S., Agnihotri, R., & Arunachalam, S. (2019). In pursuit of an effective B2B digital marketing strategy in an emerging market. *Journal of the Academy of Marketing Science*, 47(6), 1085–1108.
- Wang, C. H., & Chen, S. C. (2013). Bibliometric and social network analysis for data mining: The intellectual structure of tourism destination literature. *Journal of Testing and Evaluation*, 42(1), 229–241.
- *Wang, W. Y., Pauleen, D. J., & Zhang, T. (2016). How social media applications affect B2B communication and improve business performance in SMEs. *Industrial Marketing Management*, 54, 4–14.
- *Wang, Y., Hsiao, S. H., Yang, Z., & Hajli, N. (2016). The impact of sellers' social influence on the co-creation of innovation with customers and brand awareness in online communities. *Industrial Marketing Management*, 54, 56–70.
- White, H. D., & McCain, K. W. (1998). Visualizing a discipline: An author co-citation analysis of information science, 1972–1995. *Journal of the American Society for Information Science*, 49(4), 327–355.
- Xu, X., Chen, X., Jia, F., Brown, S., Gong, Y., & Xu, Y. (2018). Supply chain finance: A systematic literature review and bibliometric analysis. *International Journal of Production Economics*, 204, 160–173.
- Yan, E., & Ding, Y. (2010). Weighted citation: An indicator of an article's prestige. *Journal of the American Society for Information Science and Technology*, 61(8), 1635–1643.
- *Zhang, C. B., & Li, Y. N. (2019). How social media usage influences B2B customer loyalty: Roles of trust and purchase risk. *Journal of Business & Industrial Marketing*, 34(7), 1420–1433.