

Bibliometric analysis of social commerce research

(Full Paper)

Chengxi Li*, Shanghai University of Finance and Economics, China, m13772002349@163.com

Lijuan Huang, Xidian University, China, huanglj820202@163.com

Linzi Li, Xidian University, China, 15029011383@163.com

Zhiqiang Qi, Xidian University, China, zq_qi1997@163.com

ABSTRACT

Recently, social commerce has attracted the attention from both academics and practitioners and became a significant emerging research area. In this paper, bibliometric analysis has been applied to identify the characteristics and the developments of social commerce research. Based on the definition, we conduct a systematic review of social commerce research by synthesizing 1900 publications published between 2003 and 2018 in Web of Science. The 1900 publications cover 4033 authors, 724 journals, 79 countries or territories, and 1648 institutions. Furthermore, ‘Computers in Human Behavior’ is the key journal publishing on social commerce research, and the USA, China and England are the countries that dominate the publication production. It can be concluded that there is much collaborative research in the social commerce domain as multi-authored publications make up the majority of all publications. In addition, three main research areas can be distinguished based on LLR (log-likelihood ratio): (1) the development trend of social commerce, (2) the relationship between customers and vendors, and (3) consumer trust in the context of social shopping. We believe that this review can provide some guidelines for future research.

Keywords: Social commerce, bibliometric analysis, systematic review, reciprocal relationship, initial trust.

*Corresponding author

INTRODUCTION

Social commerce was introduced by Yahoo in 2005, and quickly became a means for adding value to e-commerce services (Wang & Zhang, 2012). From then on, an increased attention in the research area of research area of social commerce can be observed. This has led to a continuously growing publication rate regarding social commerce, which makes it difficult to obtain a comprehensive overview on the topic. Until today, little consensus has been reached on the concept of social commerce. As social commerce involves multiple disciplines, a variety of definitions is proposed from different perspectives (Han et al., 2018). We synthesize the relevant articles and provide a list of different definitions of social commerce. (See Table 1)

In sum, most definitions refer to two components: social media and e-commerce. Therefore, we can conclude that social commerce is the mode of engaging in e-commerce activities with social media. There are some main streams of social commerce: (1) the development and mode of social commerce (Hajli, 2014; Wang & Zhang, 2012); (2) the characteristics and elements of social commerce (Huang & Benyoucef, 2013; Liang & Turban, 2011); (3) the theme frame (Liang & Turban, 2011; Zhou et al., 2013) and various specific problems under the framework, like drivers of social commerce development (Kim, 2013; Liang et al., 2011); classification, measurement and prediction of customer behavior in social media (Chen et al., 2014; Liu et al., 2015); the mechanism of customer participation and purchase behavior in social commerce (Zhang et al., 2014); and information communication in social commerce (Jiang et al., 2014), etc.

The aim of this descriptive paper is to present a macroscopic overview on the main characteristics of social commerce literature. However, the amount of publications available on a research topic is so overwhelming that makes it challenging to have a structured overview of relevant information. Many scholars proposed that bibliometric methods is based on quantitative data and can reduce reviewers’ subjectivity and bias, which have already shown the usefulness in the management research (Marzi et al., 2017). Therefore, bibliometrics has been applied to assess the performance of authors, journals, countries and institutes, and identify cooperation patterns of them in this paper. Furthermore, bibliometrics also reveals the latest advances, research directions and leading topics in the field of social commerce research.

Table 1: Literature on social commerce definitions

| Author | Term | Definition |
|----------------------------|-----------------|--|
| Leitner & Grechenig (2007) | Social shopping | In the shopping platform, customers seek out the suggestions of others, find out the products they need, and make purchases. |
| Hsiao et al. (2010) | social shopping | A new e-commerce method combining social networking with shopping. |
| Kim & Park (2013) | social commerce | A new business model of e-commerce driven by social media (e.g., SNSs) that facilitates the purchasing and selling of various products and services. |

DATA AND METHODS

We choose Web of Science Core Collection as database to retrieve data because

Esmacili et al. (2015) social commerce

As an Internet-based commercial application that makes use of technologies and social media, and it supports user-created content and interactions.

Han & Trimi (2018) social commerce

social commerce is a new business model of e-commerce, which combines web 2.0 technologies and social media to support social-related activities.

it is the most widely accepted and frequently used search engine for analysis of scientific publications (Yang et al., 2013). The last updated date for the data was July 28, 2018, and the term “social commerce” was used as search topic. This topic search means that the term “social commerce” is identified in the title, the abstract or in the keywords of the publications. Quotation marks have been included in the search term. This tighter condition ensures the robustness of the search results (Liu et al., 2013). The time span was set from 2003 to 2018 included. In total, 1900 publications related to social commerce were identified. All types of document were included in the search. The majority is article ($n = 1770$) and review ($n = 97$). The other document types, such as proceeding paper, editorial material and book review, are all less than fifty.

We export the preliminary statistics of 1900 publications stored in Web of Science to Excel. Both Excel and the freely available software program Citespace (V5.3R2) were used to analyze and visualize the following topics: (1) publication output and cited analysis, (2) authors and their cooperation, (3) journals publishing on social commerce, (4) geographical and institutional distribution and cooperation, (5) co-citation analysis.

RESULTS AND DISCUSSION

Publication Output and Cited Analysis

The number of peer-reviewed publications is an important indicator to measure the achievement of a scientific research discipline or subject. As displayed in Fig. 1, the number of social commerce publications increased since 2003. There were only 42 publications on social commerce in 2003. Until 2006, the publications on the topic remained limited (less than fifty publications each year). From 2012, an increasing number of publications could be observed every year, and a peak of publications is reached in 2016 ($n = 259$).

The cited analysis gives the number of times the publications on social commerce has been cited by other publications listed in Web of Science. In total, all 1900 publications were used 36,034 times as a reference in other publications. The average citation per publication is 18.97. 22.89% ($n = 435/1900$) was cited zero times at the time of the data extraction. Of the 1900 publications on social commerce, 9.58% ($n = 182/1900$) was cited 50 times or more, and 3.84% ($n = 73/1900$) was cited 100 times or more. It should be noted that there is a general assumption that the number of citations reflects a publication's influence and notoriety and, hence, its quality.

Based on the exponential functions of the number of publications and the sum of times cited (Fig. 1) with R^2 were 0.9244 and 0.8702 respectively, it can be stated that the publication output and the times cited of social commerce research both follow an exponential growth.

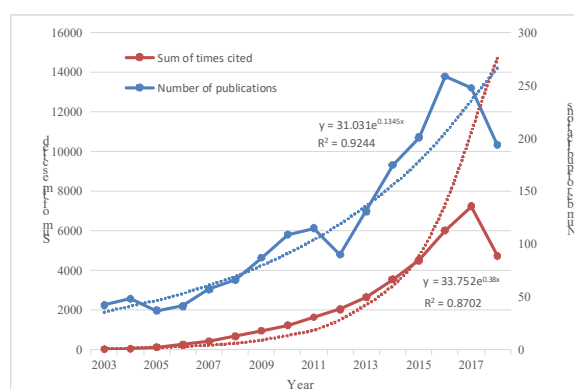


Fig 1: Number of social commerce publications and sum of times cited by year

Authors and Their Cooperation

The 1900 publications were written by a total of 4033 different authors. The largest proportion of the authors (86.96%; $n = 3,507/4033$) is only credited in one publication on the topic of social commerce. 4.81% ($n = 194/4033$) is credited in at least three publications, and 0.17% ($n = 7/4033$) is credited in ten or more publications.

Table 2 shows the core author publishing on the topic of social commerce. The core author refers to researchers who have much output and influence in a certain research field. Price's law in bibliometrics can be used to identify core authors in a research field:

$$M = 0.749\sqrt{N_{\max}} \quad (1)$$

N_{\max} is the most productive authors's total number of publications, M is the minimum number of published papers for determining the core authors. Ooi is the most productive author on the topic of social commerce with nineteen publications, so $N_{\max} = 19$. $M = 4$, that is, the author who published more than 4 papers is the core author. It can be concluded that there are 105 core authors who totally published 587 papers, accounting for 30.89% of the total in the field of social commerce. It is consistent with observations in other fields (Liu et al., 2012), that only a small group of productive authors contributes to a significant share of publications on a specific topic.

Table 2: Core authors publishing on social commerce

| Author | Number | Publication number | Percentage |
|-------------------------------------|--------|--------------------|------------|
| Ooi, KB | 1 | 19 | 1.00% |
| Chong, AYL; Lu, YB | 2 | 13 | 1.37% |
| Hajli, M. N; Lin, BS | 2 | 11 | 1.16% |
| Gupta, S; Lowry, PB | 2 | 10 | 1.05% |
| Benbasat, I; Gefen, D;...; Shin, DH | 5 | 9 | 2.37% |
| Cheung, CMK; Hsu, CL;...;Tan, GWH | 5 | 8 | 2.11% |
| Cyr, D; Davison, RM;...;Pavlou, PA | 5 | 7 | 1.84% |
| Dinev, T; Ghose, A;...;Zhao, L | 14 | 6 | 4.42% |
| Benyoucef, M; Chen, XY;...;Zhou, T | 20 | 5 | 5.26% |
| Ainin, S; Bai, Y;...;Zhu, DH | 49 | 4 | 10.32% |
| Total | 105 | 587 | 30.89% |

The average number of authors per publication was 2.12 and it can be concluded that there is much collaborative research in the social commerce domain. A high number of co-authored publications indicate a closer relationship among the authors within the same domain and a greater opportunity for future collaboration.

The cooperation pattern (i.e. co-authorship) of the authors publishing on social commerce was analyzed with Citespace. The result of this author cooperation network is presented in Fig. 2. The size of the circles represents the amount of publications, and the line between two authors represents the cooperation between them. The colors represent the collaboration clusters. In the cooperation network, the major researchers can be distinguished, like Ooi, Chong, Lu, and other researchers are linked to one of these main researchers.



Fig 2: Authors cooperation network in social commerce research

Journals Publishing on Social Commerce

In total, the 1900 publications were published in 724 different journals. This high number indicates a wide variety of research themes, and the multidisciplinary character of social commerce research. Of the 724 journals, 486 journals (67.13%) published only one publication and 128 journals (17.68%) published only two publications on the topic of social commerce. 34 journals (4.70%) published ten publications or more on the topic.

Table 3 gives information of the top-10 most active journals publishing on social commerce research. These ten journals (or 1.38% of all journals publishing on social commerce) have published more than one fifth of all social commerce publications (21.84%; $n = 415/1900$). Key journals in the field are 'Computers in Human Behavior' and 'Electronic Commerce Research and Applications', with 85 and 54 publications on the topic, respectively. The subject category 'Computer Science' appears five times in the top-10 of most active journals and 'Information Systems' appears four times.

Table 3: Top-10 of most active journals publishing on social commerce

| No. | Journal title | Number of publications | Impact factor* | Subject category of the journal* |
|-----|---|------------------------|----------------|--|
| 1 | Computers in Human Behavior | 85 | 3.536 | -Psychology, Multidisciplinary, Experimental |
| 2 | Electronic Commerce Research and Applications | 54 | 2.582 | -Computer Science, Information Systems, Interdisciplinary Applications |
| 3 | International Journal of Electronic Commerce | 42 | 2.514 | -Computer Science, Software Engineering |
| 4 | Decision Support Systems | 40 | 3.565 | -Computer Science, Artificial intelligence, Information Systems -Operations Research & Management Science |
| 5 | Information Management | 39 | 3.890 | -Computer Science, Information Systems |
| 6 | International Journal of Information Management | 37 | 4.516 | -Information Science & Library Science |
| 7 | Internet Research | 34 | 3.828 | -Computer Science, Information Systems -Telecommunications |
| 8 | Behavior & Information Technology | 30 | 1.380 | -Ergonomics |
| 9 | Journal of Electronic Commerce Research | 28 | 1.667 | -Business |
| 10 | International Journal of Mobile Communications | 26 | 1.742 | -Communication |

* Impact factors and subject categories were retrieved from the 2017 Journal Citation Reports®.

Geographical and Institutional Distribution and Cooperation

Countries and territories

Social commerce publications originate from 79 different countries or territories. Fig. 3 shows the top-10 of most productive countries and territories on social commerce research. Economic development seems to contribute to scientific and academic investment, as all of the 7 major industrialized countries of the world (G7: USA, Japan, Italy, Germany, UK, Canada and France) were ranked in the top-15 of most productive countries publishing on social commerce research. The pattern of domination of the G7 has occurred in most scientific fields, reflecting the high economy activity and academic level of these countries (Liu et al., 2012; Yang et al., 2013).

The cooperation network between countries and territories publishing on social commerce was analyzed with Citespace and the result is presented in Fig. 4. The size of the circles represents the amount of publications, and the thickness of links represents the strength of collaborations. The colors represent the collaboration clusters. Some major clusters can be distinguished: one gathering around USA, one around the China and other major contributors: England, Taiwan, South Korea,

Australia and Canada. As found in other scientific research domains, collaborative countries tend to center around the most productive countries in terms of publication output (Zheng et al., 2016).

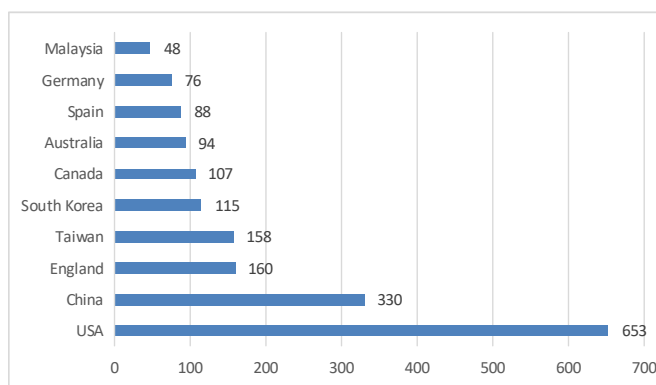


Fig 3: Top-10 of most productive countries and territories on social commerce research



Fig 4: Cooperation network between countries and territories in social commerce research

Institutions

1648 different research institutions participated in the 1900 publications with institution information (one institution can be affiliated to more than one publication). Table 4 gives information on the top-10 of most productive institutions publishing on social commerce. The three most productive institutions were located in the China. The institution which published the most publications on the topic ($n = 55$) is the City University of Hong Kong. The vast majority of the top-10 institutions are Asian universities.

The result of cooperation network between institutions publishing on social commerce is presented in Fig. 5. It can be seen that collaborative institutions also center on the most productive institutions like City University of Hong Kong, Huazhong University of Science and Technology and University of Science and Technology of China. Numerous institutions of North America and Europe are willing to cooperate with Asian institutions in the field of social commerce.

Table 4: Top-10 of most productive institutions publishing on social commerce

| No. | Institution | Country | Number of publications |
|-----|---|-------------|------------------------|
| 1 | City University of Hong Kong | China | 55 |
| 2 | Huazhong University of Science and Technology | China | 23 |
| 3 | University of Science and Technology of China | China | 23 |
| 4 | University Tunku Abdul Rahman | Malaysia | 20 |
| 5 | The University of Maryland | USA | 17 |
| 6 | The Hong Kong Polytechnic University | China | 16 |
| 7 | Pennsylvania State University | USA | 16 |
| 8 | Sungkyunkwan University | South Korea | 16 |
| 9 | The University of Illinois Urbana | USA | 16 |
| 10 | University of Malaya | Malaysia | 16 |



Fig 5: Cooperation network between institutions in social commerce research

Co-citation Analysis of Social Commerce Research

Co-citation analysis

Co-citation analysis focuses on the relationship or interaction between two publications, reveal the theoretical foundations of the research field by assessing the similarities among cited articles (Boyack & Klavans, 2010). The more two publications are cited together, the more similarities between them can be assumed (Li and Hale, 2015). Citespace was used to analyze and visualize the co-citation. To ensure the clarity of clusters, the whole sample is divided into several sub-samples of 4 years from 2003 to 2018. Totally, 79,506 references were used by the 1900 publications on social commerce, and the final data set contained 78424 references.

Fig. 6 shows the bibliographic network based on co-citation analysis and reveals the theoretical cornerstones of social commerce research.. The size of the circles represents the number of citations, so the more a publication has been cited in the social commerce publications, the larger a circle, and it can be more possible a Landmark node. The line between two publications suggests they have been cited together before. The color of line and circle distinguishes references in four time period. It can be seen from Fig.6 that many publications (from 2011 to 2014) with yellow circles are landmark nodes.

Pivot node is the point connecting two clusters. The emergence of the Pivot node often leads to the transformation of the research focus in a certain field, which is an important node of the discipline development and evolution process. Pivot node and Landmark node can be automatically identified by calculation in CiteSpace and highlighted in purple circles, such as Gefen (2003) in Figure 6.

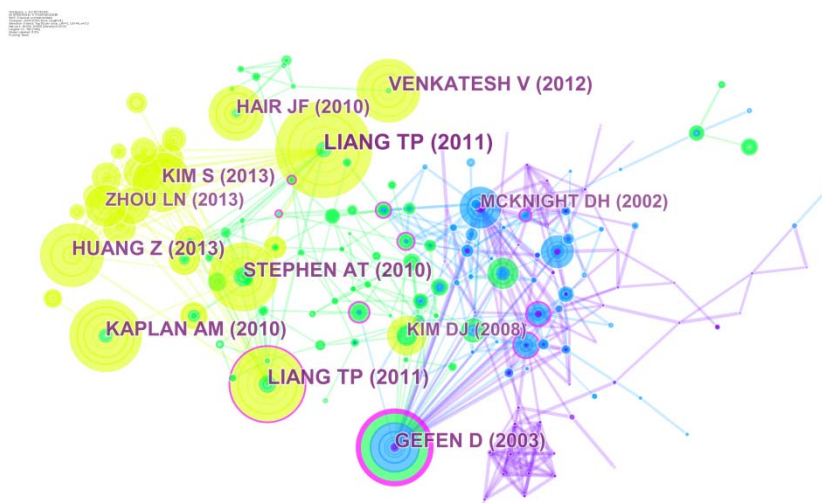


Fig 6: Co-citation analysis of highly-cited references used in publications on social commerce

Cornerstones of social commerce research

CiteSpace was used to cluster the sample, and a total of 50 clusters are generated. Citation cluster analysis mainly uses the co-citation intensity as the basic unit and classifies a given collection of citation documents. This analysis can aggregate the papers with close content into a cluster of documents, calculating the degree of connection among clusters according to the network indicators, and then generate a cluster analysis network of a certain field. The node with purple in Figure 6 is the Pivot node calculated by betweenness centrality (greater than 0.1). Betweenness centrality is an indicator to discover and measure the importance of the literature. Silhouette Coefficient is an evaluation method of cluster effect. It was first proposed by Rousseeuw in 1986 that combines two factors of cohesion and resolution. It can be used to evaluate the impact of different algorithms, or different operating modes of the algorithm on the cluster results based on the same raw data. The closer the Silhouette value to 1, the more reasonable the cluster is.

In Figure 7, the labels with "#" are generated by extracting the eigenvalue from the subject terms according to the log-likelihood ratio. Only six clusters have sufficient similarity (Silhouette value is close to 1) and enough nodes (greater than 10). Table 5 shows the specific information of six clusters.

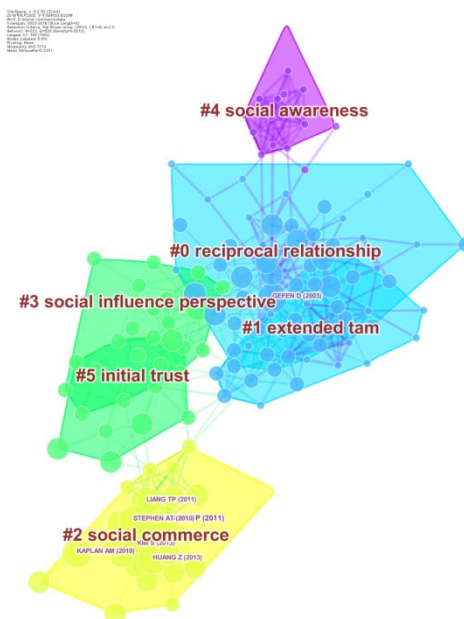


Fig 7: Co-citation cluster of highly-cited references used in publications on social commerce

Table 5: The information of main co-citation cluster

| No. | Silhouette coefficient | Top term | size |
|-----|------------------------|------------------------------|------|
| 0 | 0.653 | Reciprocal relationship | 44 |
| 1 | 0.820 | Extended TAM | 26 |
| 2 | 0.933 | Social commerce | 26 |
| 3 | 0.818 | Social influence perspective | 19 |
| 4 | 0.957 | Social awareness | 15 |
| 5 | 0.744 | Initial trust | 12 |

To facilitate interpretation of the clusters, we restricted the focus to references that are Landmark node, Pivot node or citation bursts. This helps us to focus on the most important publications and facilitated interpretation of the identified clusters in the network.

Cluster “#0”, which includes 44 articles, can be labeled as “reciprocal relationship”. The cornerstone of this cluster is “Trust and TAM in online shopping: an integrated mode”. The research is the Landmark node, Pivot node (Betweenness Centrality is 0.40) and Citation burst (from 2006 to 2011). It was not only the foundation and basic literature of social commerce research, but also a hot research topic at that time. This study shows that consumers’ trust in the e-vendor influences their purchase intentions in online commerce. Based on the widely accepted TAM use-antecedents, the authors provide evidence that online trust is built through the interaction between vendors and customers, safety mechanisms, typical interface and ease of use.

Cluster “#1” is labelled as “extended TAM” and it encompasses 26 publications. Kumar and Benbasat (2006) filtered the content of Amazon.com to empirically test the influence of recommendations and consumer reviews on the social commerce. The results demonstrate that the provision of recommendations and consumer reviews increases both customer perceived usefulness and social presence in the shopping context. The study was heavily quoted from 2009 to 2014, and as a Pivot node (Betweenness Centrality is 0.11) triggered a new exploration of the factors influencing consumer behavior in social commerce.

Cluster “#2” is labeled “social commerce” and includes 26 publications. A framework was presented including research theme, social media, commercial activities, underlying theories, outcomes and research methods to define the scope of social commerce research (Liang et al., 2011). This article has not only received a lot of attention from scholars, but also provides a reference for identifying potential research issues in social commerce (Betweenness Centrality is 0.11).

Cluster “#3” is labelled as “social influence perspective”, encompassing 19 publications. The principal-agent perspective was extended to propose a set of four antecedents of perceived uncertainty in online buyer-seller relationships and a set of four uncertainty mitigating factors (Pavlou et al., 2007). The proposed structural model is empirically tested and the result implicated that through mitigating consumers’ uncertainty perceptions, online exchange relationships for different of purchases can be better understood and online transactions can be facilitated. This cluster is a further in-depth study of Cluster “#0”.

Cluster “#5” includes 15 articles and captures research that we labelled: “initial trust”. Trust directly and indirectly affects a consumer's purchase decision in combination with perceived risk and perceived benefit, and also that trust has a longer term impact on consumer e-loyalty through satisfaction (Kim et al., 2009). The research recognizes the crucial roles of trust plays in the business-consumer social commerce. Betweenness Centrality of this study is 0.10 that brings a change in research direction.

In the cluster analysis report generated by CiteSpace, there is no Landmark node or Pivot node in the cluster “#4”. Therefore, we filtered the literature with citation burst - “Information Privacy Concerns, Procedural Fairness, and Impersonal Trust: An Empirical Investigation”. This research illustrated that customer relationships are characterized by social distance, so the firms should observe procedural fairness to let customers depend on strangers to act on their behalf. Though hypothesis and empirical test, the study addressed the tensions that arise between the collection and use of personal information that people provide in the course of most electronic transactions.

The analysis of timeline

As shown in figure 8, the documents of the same cluster are placed on the same horizontal line. The time of the document is placed at the top of the view. The more the literature in the cluster, the more significant this cluster is. Through the timeline view, the time span of various types of literature and the rise, prosperity and decline of a certain research field can be obtained. In addition, important documents in each cluster can be measured by the indicators of Citation Burst and Betweenness Centrality.

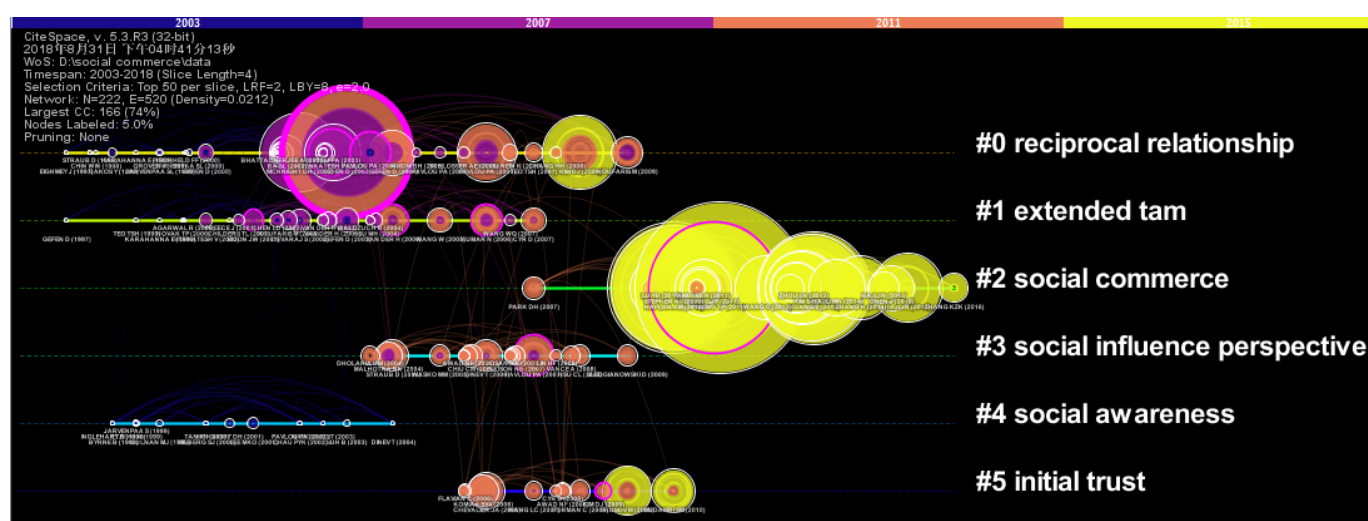


Fig 8: Timeline of highly-cited references used in publications on social commerce

It can be seen from Fig. 8 that the literature in cluster “#1”, “#3”, “#4”, and “#5” have received relatively little attention in the past fifteen years, and especially cluster “#4”, almost has no concern. Cluster #0 showed more Landmark nodes and Pivot nodes around 2007, but after 2015, the trend has weakened and fewer large nodes have appeared. In contrast, in cluster “#2” and cluster “#5”, before 2011, only a small number of documents marked as Landmark nodes. However, after 2011, the attention to these two topics was not reduced. In particular, a large number of important documents have emerged in Cluster “#2” within the past five years, and has led to new changes in research.

Based on co-citation network and cluster analysis, we can conclude that clusters “#0”, “#2”, and “#5” are the most important clusters in the co-citation network because the literature of these three clusters still has contributions after 2015. Therefore, these three clusters represent the frontier research issues of social commerce, that is, the research hotspots in this field are concentrated on the development trend of social commerce, the relationship between customers and vendors, and consumer trust in the context of social shopping.

CONCLUSIONS

Summary

In the previous sections, we presented a systematic and comprehensive review of the bibliographic literature from 2003 to 2018 in social commerce research. The topic of social commerce has been a field of extensive research during the last fifteen years and its publication output is characterized by an exponential growth. The study includes 1900 publications on social commerce covering 4033 authors, 724 journals, 79 countries or territories, and 1648 institutions.

Some positive aspects could be derived from the bibliometric analysis. Firstly, it can be concluded that there is much collaborative research in the social commerce domain, as multi-authored publications make up about a significant share of all publications. Secondly, many different journals publish on the topic and a wide range of subject categories is assigned to the social commerce publications, which indicates a wide variety of research themes, and the multidisciplinary character of social commerce research. Thirdly, regarding organizational social commerce, it seems that there is a movement away from human aspects towards more technical aspects. It should be acknowledged that technological aspects remain important, as social commerce represents a holistic, comprehensive term that comprises a totality of technological, organizational and human factors.

Also, some points of concern could be concluded. A geographical inequality, which is related to economic development, can be seen in social commerce research. The share of South America and especially Africa is very limited.

Future Research and Limitations

In this section we firstly present several important areas in the field of social commerce that merit future research: (1) the development trend of social commerce, (2) the relationship between customers and vendors, and (3) consumer trust in the context of social shopping. The co-citation review revealed that the research area of initial trust seems to be a more theoretical, where mediating reciprocal relationship between customers and e-vendors has a more practical-oriented emphasis. The research in the domain of the development trend of the social commerce stands in a dominant position in social commerce research nowadays.

Finally, some limitations of this bibliometric study should be addressed. First of all, the search was limited to publications listed in Web of Science. Although Web of Science is among the largest global databases, it does of course not contain all publications in the field of social commerce research. Other international databases such as Scopus could have been used. However, Web of Science is the most widely accepted and frequently used database for analysis of scientific publications (Yang et al., 2013). Another limitation of bibliometrics is that analysis can only be done for the existing classifications included in Web of Science. This leads to the omission of other valuable information, such as the distinction between theoretical and empirical papers and more details on the context in case of empirical research (for instance the sectors or the countries in which the study was conducted). Based on these limitations characterizing bibliometric analysis, a deeper content analysis is recommended for further research.

ACKNOWLEDGMENT

This work was supported by Chinese Fundamental Research Funds for the Central Universities [No. JB1606096]; and Chinese Ministry of Education Humanities and Social Sciences project [No. 16YJC630038].

REFERENCES

- [1] Boyack, K. W., & Klavans, R. (2010). Co-citation analysis, bibliographic coupling, and direct citation: Which citation approach represents the research front most accurately?. *Journal of the American Society for Information Science and Technology*, 61(12), 2389-2404.
- [2] Chen, A., Lu, Y., Chau, P. Y., & Gupta, S. (2014). Classifying, measuring, and predicting users' overall active behavior on social networking sites. *Journal of Management Information Systems*, 31(3), 213-253.
- [3] Esmaili, L., Mutallebi, M., Mardani, S., & Golpayegani, S. A. H. (2015). Studying the affecting factors on trust in social commerce. *arXiv preprint arXiv:1508.04048*.
- [4] Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. *MIS quarterly*, 27(1), 51-90.
- [5] Hajli, M. N. (2014). Social commerce for innovation. *International Journal of Innovation Management*, 18(04), 1-24.
- [6] Han, H., Trimi, S. (2018). A fuzzy TOPSIS method for performance evaluation of reverse logistics in social commerce platforms. *Expert System. Application*. 103, 133-145.
- [7] Han, H., Xu, H., & Chen, H. (2018). Social commerce: A systematic review and data synthesis. *Electronic Commerce Research and Applications*, 30, 38-50.
- [8] Hsiao, K. L., Chuan-Chuan Lin, J., Wang, X. Y., Lu, H. P., & Yu, H. (2010). Antecedents and consequences of trust in online product recommendations: An empirical study in social shopping. *Online Information Review*, 34(6), 935-953.
- [9] Huang, Z., & Benyoucef, M. (2013). From e-commerce to social commerce: A close look at design features. *Electronic Commerce Research and Applications*, 12(4), 246-259.
- [10] Jiang, G., Ma, F., Shang, J., & Chau, P. Y. (2014). Evolution of knowledge sharing behavior in social commerce: an agent-based computational approach. *Information Sciences*, 278, 250-266.

- [11] Kim, D. (2013). Under what conditions will social commerce business models survive?. *Electronic Commerce Research and Applications*, 12(2), 69-77.
- [12] Kim, D. J., Ferrin, D. L., & Rao, H. R. (2009). Trust and satisfaction, two stepping stones for successful e-commerce relationships: A longitudinal exploration. *Information systems research*, 20(2), 237-257.
- [13] Kim, S., & Park, H. (2013). Effects of various characteristics of social commerce (s-commerce) on consumers' trust and trust performance. *International Journal of Information Management*, 33(2), 318-332.
- [14] Kumar, N., & Benbasat, I. (2006). Research note: the influence of recommendations and consumer reviews on evaluations of websites. *Information Systems Research*, 17(4), 425-439.
- [15] Leitner, P., Grechenig, T., Krishnamurthy, S., & Isaias, P. (2007). Community driven commerce: Design of an integrated framework for social shopping. In *IADIS International Conference e-Commerce* (p. 4).
- [16] Li, J., & Hale, A. (2015). Identification of and knowledge communication among core safety science journals. *Safety science*, 74, 70-78.
- [17] Liang, T. P., & Turban, E. (2011). Introduction to the special issue social commerce: a research framework for social commerce. *International Journal of electronic commerce*, 16(2), 5-14.
- [18] Liang, T. P., Ho, Y. T., Li, Y. W., & Turban, E. (2011). What drives social commerce: The role of social support and relationship quality? *International Journal of Electronic Commerce*, 16(2), 69-90.
- [19] Liu, X., Zhan, F. B., Hong, S., Niu, B., & Liu, Y. (2012). A bibliometric study of earthquake research: 1900-2010. *Scientometrics*, 92(3), 747-765.
- [20] Liu, X., Zhan, F. B., Hong, S., Niu, B., & Liu, Y. (2013). Replies to comments on "a bibliometric study of earthquake research: 1900 - 2010" . *Scientometrics*, 96(3), 933-936.
- [21] Liu, Y., Li, H., Peng, G., Lv, B., & Zhang, C. (2015). Online purchaser segmentation and promotion strategy selection: evidence from Chinese E-commerce market. *Annals of Operations Research*, 233(1), 263-279.
- [22] Marzi, G., Dabić, M., Daim, T., & Garces, E. (2017). Product and process innovation in manufacturing firms: a 30-year bibliometric analysis. *Scientometrics*, 113(2), 673-704.
- [23] McKnight, D. H., Choudhury, V., & Kacmar, C. (2002). Developing and validating trust measures for e-commerce: An integrative typology. *Information systems research*, 13(3), 334-359.
- [24] Moon, J. W., & Kim, Y. G. (2001). Extending the TAM for a World-Wide-Web context. *Information & management*, 38(4), 217-230.
- [25] Pavlou, P. A., Liang, H., & Xue, Y. (2007). Understanding and mitigating uncertainty in online exchange relationships: A principal-agent perspective. *MIS quarterly*, 105-136.
- [26] Wang, C., & Zhang, P. (2012). The evolution of social commerce: The people, management, technology, and information dimensions. *CAIS*, 31(5).
- [27] Yang, L., Chen, Z., Liu, T., Gong, Z., Yu, Y., & Wang, J. (2013). Global trends of solid waste research from 1997 to 2011 by using bibliometric analysis. *Scientometrics*, 96(1), 133-146.
- [28] Zhang, H., Lu, Y., Gupta, S., & Zhao, L. (2014). What motivates customers to participate in social commerce? The impact of technological environments and virtual customer experiences. *Information & Management*, 51(8), 1017-1030.
- [29] Zheng, T., Wang, J., Wang, Q., Nie, C., Shi, Z., Wang, X., & Gao, Z. (2016). A bibliometric analysis of micro/nano-bubble related research: current trends, present application, and future prospects. *Scientometrics*, 109(1), 53-71.
- [30] Zhou, L., Zhang, P., & Zimmermann, H. D. (2013). Social commerce research: An integrated view. *Electronic commerce research and applications*, 12(2), 61-68.

(*Full reference list is available upon request from the corresponding author.)

APPENDIX A: The information of landmark node, pivot node and citation bursts

| Author and journal | Title | Cluster | Landmark node | Pivot node | Citation bursts |
|--------------------------------------|--|---------|---------------|------------|-----------------|
| GEFEN D, 2003, MIS QUART | Trust and TAM in online shopping: an integrated model | 0 | • | • | • |
| Pavlou PA, 2003, INT J ELECTRON COMM | Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model | 0 | | • | • |
| Pavlou PA, 2004, INFORM SYST RES | Building effective online marketplaces with institution-based trust | 0 | | • | • |
| Mcknight DH, 2002, INFORM SYST RES | Developing and validating trust measures for e-commerce: An integrative typology | 0 | • | | • |
| BAKOS Y, 1998, COMMUN ACM | The emerging role of electronic marketplaces on the Internet | 0 | | | • |
| van der H, 2004, MIS QUART | User Acceptance of Hedonic Information Systems | 1 | | • | • |
| Kumar N, 2006, INFORM SYST RES | Research note: the influence of recommendations and consumer reviews on evaluations of websites | 1 | | • | • |
| Moon JW, 2001, INFORM MANAGE | Extending the TAM for a World-Wide-Web context | 1 | | • | • |
| VENKATESH V, 2000, MANAGE SCI | A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies | 1 | | | • |
| Lu HP, 2010, INFORM MANAGE-AMSTER | The influence of extro/introversion on the intention to pay for social networking sites | 2 | | • | • |
| Liang TP, 2011, INT J ELECTRON COMM | Introduction to the special issue social commerce: a research framework for social commerce | 2 | • | • | • |
| Liang TP, 2011, INT J ELECTRON COMM | What drives social commerce: The role of social support and relationship quality | 2 | • | | • |
| Kaplan AM, 2010, BUS HORIZONS | Users of the world, unite! The challenges and opportunities of Social Media | 2 | • | | • |
| Stephen AT, 2010, J MARKETING RES | Deriving value from social commerce networks | 2 | • | | • |
| Huang Z, 2013, ELECTRON COMMER R A | From e-commerce to social commerce: A close look at design features | 2 | • | | • |
| Kim S, 2013, INT J INFORM MANAGE | Effects of various characteristics of social commerce (s-commerce) on consumers' trust and trust performance | 2 | • | | • |
| Pavlou PA, 2007, MIS QUART | Understanding and Mitigating Uncertainty in Online Exchange Relationships: A Principal-Agent Perspective | 3 | | • | • |
| CULNAN MJ, 1999, ORGAN SCI | Information Privacy Concerns, Procedural Fairness, and Impersonal Trust: An Empirical Investigation | 4 | | | • |
| Kim DJ, 2009, INFORM SYST RES | Trust and satisfaction, two stepping stones for successful e-commerce relationships: A longitudinal exploration. | 5 | | • | • |