COHERENCE – The Multidisciplinary Research Journal
Volume No: 11, Issue No: 2, Year: 2021 (July-December)
PP: 10-17
ISSN: 0976-5301
Peer Reviewed & Refereed Journal
Journal Website www.coherencejournal.in

A Bibliometric Analysis of FinTech Research Trends and Co-Citation Networks

Jaswinder Kaur

*Assistant Professor, Post-Graduate Department of Commerce, Sri Guru Gobind Singh College, Sector-26, Chandigarh

Abstract

The majority of firms and users nowadays demand a personalized rich digital experience anytime, anywhere, and in every field. So, fintech has broadened its horizons, by not limiting up to banking and finance only, but also explored for other fields. Numerous studies have been conducted on fintech. But in the present study, trends are shown by carrying out bibliometric analysis on the data provided by Scopus and co-citation to review the pattern and status of the fintech industry. The time duration was from 1999 to 2018. The three aspects under evaluation were references, sources, and authors. The study selected a total of 578 documents for analysis. Regarding most cited references, *belleflamme, p., lambert, t., schwienbacher, a., crowdfunding: tapping the right crowd (2014) journal of business venturing* took the lead. The highly cited source was *MIS quarterly* and for authors, *kauffman, r.j.* has taken a top position with a list of more authors. This study aims to evaluate and analyze the trends and patterns of scientific production on fintech over the years. It explored the structure of fintech using VOS viewer. The outcomes conjunctively got from this software will support future researchers.

Keywords*: FinTech, Co-citation Analysis, Start-ups*

1.Introduction

Fintech or financial technology emerged as the fastest-growing technology. It is best required by the venture capitalists, as they need updated and advanced techniques to be adopted for the accessibility of their business. This technology has been promoted as a computerized version for the services of banks and finance. It is termed the automated method used for all types of financial activities. The financial services-related companies, while dealing with customers or promoters, need technology at every stage. Fintech companies are counted in the stream of top-level companies, because of their caliber to deal with business transactions online, without the interference of mediators. It is having been expanded worldwide by making peer-to-peer transactions swiftly. Fintech has broadened its horizons, by not limiting up to banking and finance only, but also explored other fields. Due to the expansion of technology, users had started looking down upon traditional services of banking and finance. So, the innovation of fintech was there to support them. Fintech has based on some algorithms and advanced software. This software can be operated on all types of smartphones, computers, and laptops. Its speed and accuracy make it more advantageous. Financial technology is reshaping our economic services. They are cost-friendly and having greater potential to upgrade the quality of financial services. The trends are showing a growth pattern of financial technology for the last few years. Fintech Industry is a collaboration of information technology and financial services. With the introduction of technology in the business industry, the demand for mobile subscriptions and internet usage has been increased. This study presents Fintech-based co-citation analysis to review the citations of selected published articles.

Co-citation analysis is the best way of visualizing any field topic may it be science, economics, or any other. It is a technique of mapping the cognitive structures of a particular science subject. Now co-citation analyses of topics related to any field from single cluster to multi-dimension are possible. Co-citation of author, sources, and references usually depicts

ISSN: 0976-5301
Peer Reviewed & Refereed Journal
Journal Website www.coherencejournal.in

the frequencies of citing at the same time two documents together and particularly by some other document. This relation is shown with the help of nodes and various color codes along with the labels of authors. In the fintech industry, trends are shown by bibliometric analysis, and bibliographic data is used for co-citation analysis. Co-citation of fintech is carried out to review the trend and status of it.

Several studies have been conducted targeting at mapping the bibliographic characteristics of research in diverse fields (Glanzel et al. (1999), Schildt et al. (2006), Chiu et al. (2007), Lisee et al. (2008), Persson et al. (2009), Bonilla et al. (2015), Ellegaard et al. (2015), Ferreira et al. (2016), Merigo et al. (2017)). Few bibliographic studies aiming at fintech(Wu, P.S. (2017), Deshpande et al. (2020), Li et al. (2020), Pan et al. (2020)). Though, none of these studies investigated the trends and patterns of scientific production in this field using co-citation analysis, which is the scope of this study. The present study is meant to measure semantic similarity in the publications on fintech using the co-citation technique.

To complete this research work, the study is designed firstly with an introduction section, leading towards the review of literature as the second section, third is research methodology regarding the concept adopted, analysis is to be done in the fourth section and the fifth section includes the conclusion of the analysis.

2. Review of Literature

Several publications are involved in assessing and researching the fintech industry trends. Researchers and business aspirants all over the world have been carrying out studies to assess this financial technology and a big number of publications have already been produced to date. Baskerville and Dulipovici (2017) explained knowledge management as a vital portion of the information system. They discussed various fields of knowledge management and all related theories. They took publications from 1995 to 2005. Their analyses revealed a healthy arena along with clear directions for researchers. Haddad and Hornuf (2016) investigated the emergence of the fintech markets on the global level by taking economy and technology as determinants. They found that with fintech start-ups and blooming technology more mobile subscriptions and market segments emerged. It was suggested to make active policies to develop start-ups. Wang (2016) examined 41 important papers from a period of 11 years. They adopted the path of three stages from incubation to exploring up to burgeoning. Co-citation analysis was done on it and the knowledge structure of cloud computing was checked. Recommendations for the next-generation researchers were provided. Arner (2015) summarised the evolution of fintech. They found that bonding between information technology and financial technology started in an analog context to the digitalization of finance and then fintech start-ups. They found that fintech created more challenges for market participants. Rainer Bohme (2015) revealed the evolution and future nature of Bitcoin. Also, they considered its economic and technological aspects used for its existence and governance adopted. They resulted in Bitcoin and its electronic payment system very challenging and competitive. Shiau et al. (2015) studied various key issues that usually occurred in management information systems (MIS). They used the ISI database for identifying key issues. Results depicted a detailed analysis of thirteen different issues regarding MIS. This study highly supported future researchers. Delone and McLeon (2014) presented their model of information systems for measuring the complex-dependant variables. They conducted a study for updating their 10-year-old study. Their model was all about challenges and enhancement of their model. Hsiao and Yang (2011) presented a co-citation analysis of multiple fields of the technology acceptance model. Proper visual mapping was shown in two dimensions regarding intellectual structures. The method applied was a sequence of statistical analyses. The study saw managerial implications in practical and academic aspects. Malcolm

ISSN: 0976-5301
Peer Reviewed & Refereed Journal
Journal Website www.coherencejournal.in

Tight (2007) conducted a study on higher education research firstly on tribe, territory, and then on the community. Co-citation analyses were done to understand the necessity and interlinkage of citations of 406 published articles. They attempted to identify key members of the community and tribes and their relations. Evans and Leighton (1990) surveyed to examine bonding among small business formation and the dissolution for the white men-women. They found unemployed people who prefer self-employment had more ratio of dropping than the people who return to work.

3.Research Methodology

Research methodology explains the pattern of the research to be made. This section allows the researchers to use various techniques, procedures, and methods to identify, process and evaluate the data related to the topic. This study aimed to perform a co-citational analysis on FinTech with the help of data taken from the well-known Scopus Database. This analysis will provide a comprehensive approach regarding the concerned topic. For co-citational analysis time duration from 1999 to 2018 was selected. The reason for adopting this long duration is to deeply grasp the loopholes of the topic. With the help of the Scopus database, a total of 578 documents were selected for analysis. These documents were obtained after applying various filters. To generate better results, analysis was done on a co-citational basis. The three aspects under evaluation were references, sources, and authors. The data was then downloaded into Excel software for generating further analysis. VOS viewer software has been applied to perform co-citation analysis.

4.Co-citation analysis

Co-citation is all about citing two papers or items at the same time by the other paper. It is an attractive way to understand the social structure of the concerned topic.

4.1 Co-citation analysis of cited reference

The co-citation analysis of cited references is shown in the map regarding financial technology by using VOS viewer software. The analysis was done on the most cited references obtained regarding the topic of fintech. The outcomes provided the data of 408 documents, with a minimum of 2 citations of cited references to meet the threshold, out of 19162 cited references. In citation map, *belleflamme, p., lambert, t., schwienbacher, a., crowdfunding: tapping the right crowd (2014) journal of business venturing* has seen with citations 7 and total link strength 37. They focused on the emerging business models and other business model reforms. Maximum citations were seen in *venkatesh, v., davis, f.d.,* a theoretical extension of the technology acceptance model: four longitudinal field studies (2000) management science with 6 citations and 25 total link strength. They put stress on developing a theoretical extension of the Technology Acceptance Model (TAM). Cited references depict the most cited references which are viewed the most and have been supportive for other papers on fintech. A total of 408 documents are there with citations not less than 2. This study shows the networking of references with the help of nodes (Fig.1). This analysis allows us to understand which references are more towards financial technology.

ISSN: 0976-5301
Peer Reviewed & Refereed Journal
Journal Website www.coherencejournal.in

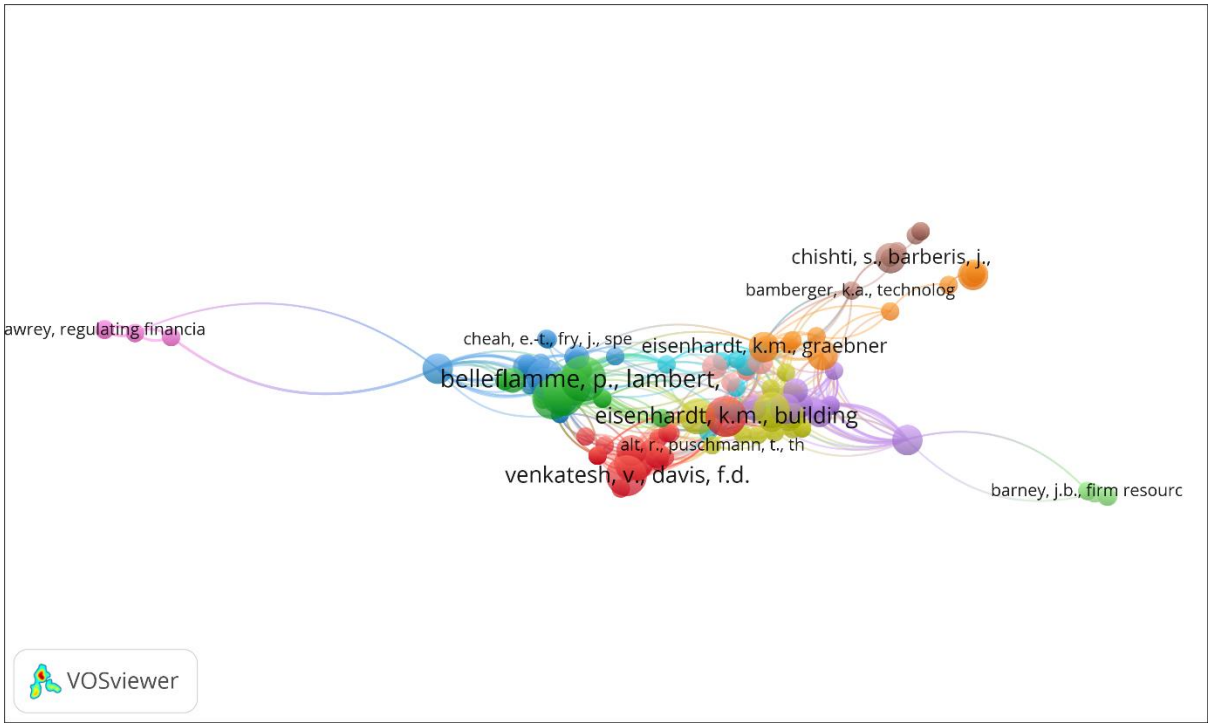

Fig.1 Co-citation map of cited references

4.2 Co-citation analysis of cited Source

The co-citation analysis based on cited sources presents various sources or journals where the work related to the concerned topic has been done. Fintech topic talks about the recent issues of the business. This topic is having concern with multiple subjects and is highly demanded. Its network shows high link strength and a thick co-citation relationship with the help of connected nodes. Cited sources related to financial technology or fintech throws light on journals where this topic is discussed and viewed for future references. As a result, a total of 159 sources, with a minimum of 9 citations of cited sources meet the threshold, out of a total of 10407 cited sources. *MIS quarterly* is leading the list of highest citations 122 and 2406 total link strength. Their work notifies the frequent information technology techniques. The list is continued with the *journal of finance* with 115 citations and total link strength of 6084. This journal is widely used and high-quality papers are published in it. It is mainly popular for building management theories and it is extended for all fields like meta-analysis, laboratory, mixed methods, and many more. It is related to Linking nodes that can be viewed on a map (Fig. 2).

ISSN: 0976-5301
Peer Reviewed & Refereed Journal
Journal Website www.coherencejournal.in

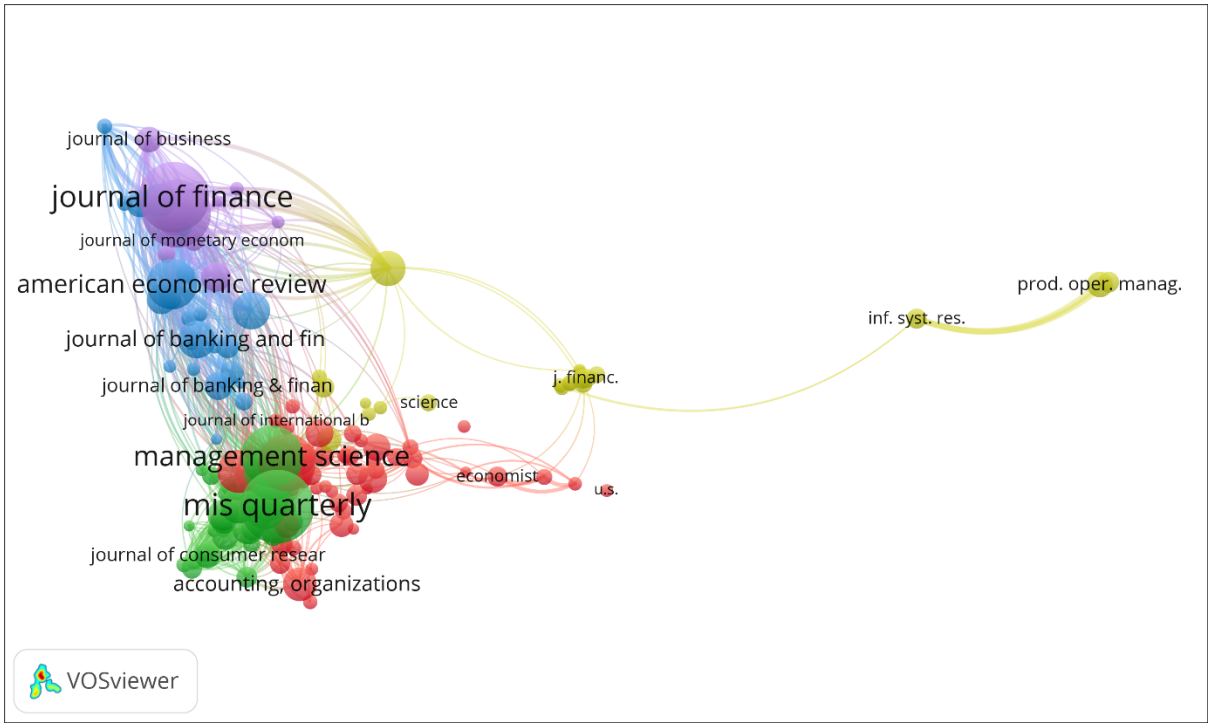

Fig.2 Co-citation map of cited sources

4.3 Co-citation analysis of the cited author

Regarding co-citation analysis of authors, this study obtained 159 authors that met the set cut-off at a minimum number of citations 12, out of the whole 18704 cited authors received. Out of all these authors, *kauffman, r.j.* has been taken the top position with a maximum of 88 citations and 2362 total link strength. Their studies were mainly related to information technology and electronic commerce. It is followed by author *gai, k.*with 83 citations and total link strength of 5934. Their studies relate to modern computing techniques. The link between the two nodes shows the relationship of co-citations. Every node presents an author in a given network. Network shows the links and every link had some strength, which shows relationship thickness. The co-citation-based relation is shown by the linkage between the author citation and the size of the node. The node size helps us understand more times the author has been cited. The trends are showing a growth pattern of financial technology for the last few years. Fintech Industry is a collaboration of information technology and financial services. citation of author, sources, and references usually depicts the frequencies of citing at the same time two documents together and particularly by some other document. This relation is shown with the help of nodes and various color codes along with the labels of authors. We can easily view their high and low relation representation by looking at their node size in the map (Fig. 3).

ISSN: 0976-5301
Peer Reviewed & Refereed Journal
Journal Website www.coherencejournal.in

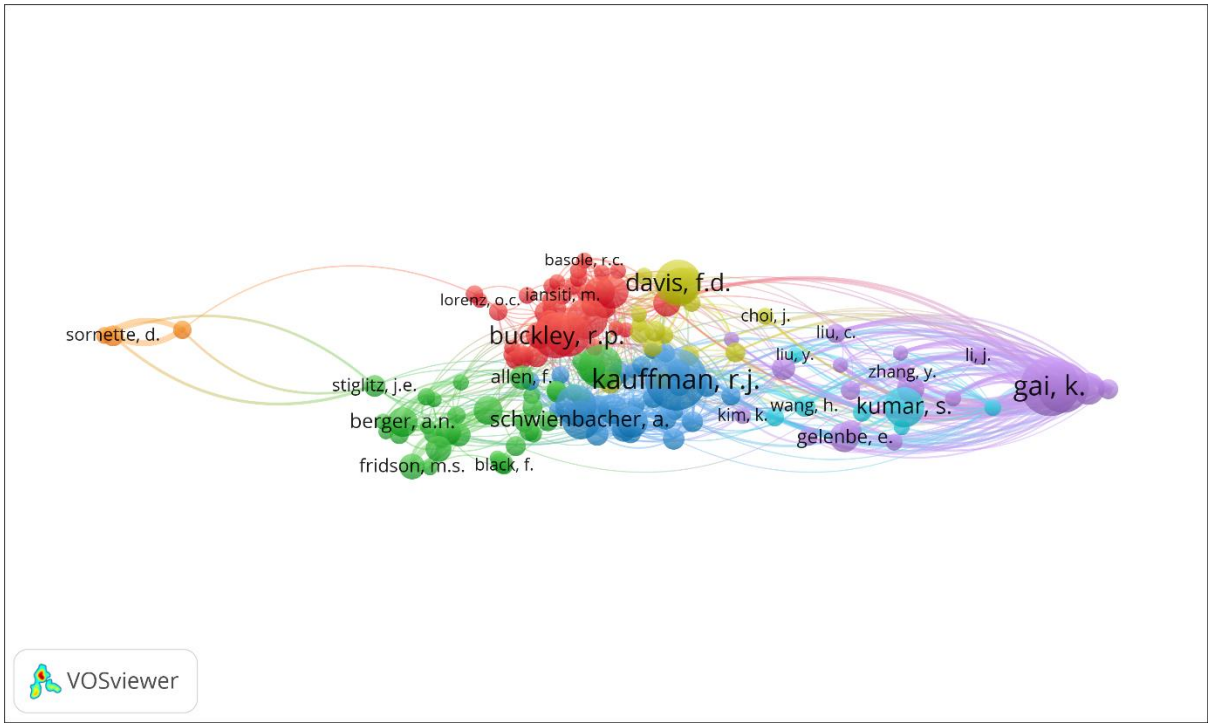

Fig.3 Co-citation map of cited authors

5. Conclusion and Future Recommendation

Fintech companies are counted in the stream of top-level companies, because of their caliber to deal with business transactions online, without the interference of mediators. It can be visualized in these co-citation analyses, which illustrate cited references mapping and source-wise and author-wise mapping. The outcomes provided the data of 408 documents, with a minimum of 2 citations of cited references to meet the threshold, out of 19162 cited references. In citation map, *belleflamme, p., lambert, t., schwienbacher, a., crowdfunding: tapping the right crowd (2014) journal of business venturing* has seen with citations 7 and total link strength 37. Cited sources related to financial technology or fintech throws light on journals where this topic is discussed and viewed for future references. As a result, a total of 159 sources, with a minimum of 9 citations of cited sources meet the threshold, out of a total of 10407 cited sources. *MIS quarterly* is leading the list of highest citations 122 and 2406 total link strength. Regarding co-citation analysis of authors, this study obtained 159 authors that met the set cut-off at a minimum number of citations 12, out of the whole 18704 cited authors received. Out of all these authors, *kauffman, r.j.* has been taken the top position with a maximum of 88 citations and 2362 total link strengths This structure of trends gives an idea about the progress of fintech. This study encourages achieving an accurate and proper insight towards the topic undertaken. Future researchers can easily recognize innovative and right directions to explore more about it.

References

1. Arner, D. W., Barberis, J., & Buckley, R. P. (2015). The evolution of fintech: a new post-crisis paradigm? University of Hong Kong Faculty of law research paper no. 2015/047. In *to be published in the Georgetown Journal of International Law*.
2. Arner, D. W., Barberis, J., & Buckley, R. P. (2015). The evolution of Fintech: A new post-crisis paradigm. *Geo. J. Int'l L.*, *47*, 1271.

ISSN: 0976-5301
Peer Reviewed & Refereed Journal
Journal Website www.coherencejournal.in

3. Baskerville, R., & Dulipovici, A. (2006). The theoretical foundations of knowledge management. *Knowledge Management Research & Practice*, *4*(2), 83-105.
4. Böhme, R., Christin, N., Edelman, B., & Moore, T. (2015). Bitcoin: Economics, technology, and governance. *Journal of economic Perspectives*, *29*(2), 213-38.
5. Bonilla, C. A., Merigó, J. M., & Torres-Abad, C. (2015). Economics in Latin America: a bibliometric analysis. *Scientometrics*, *105*(2), 1239-1252.
6. Chiu, W. T., & Ho, Y. S. (2007). Bibliometric analysis of tsunami research. *Scientometrics*, *73*(1), 3-17.
7. Delone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of management information systems*, *19*(4), 9-30.
8. Deshpande, V., &Arunkumar, O. N. (2020). Evolution of fintech in supply chain: a literature-based review on bibliometric analysis. *Psychology and Education Journal*, *57*(9), 5769-5776.
9. Ellegaard, O., &Wallin, J. A. (2015). The bibliometric analysis of scholarly production: How great is the impact? *Scientometrics*, *105*(3), 1809-1831.
10. Evans, D. S., & Leighton, L. S. (1990). Small business formation by unemployed and employed workers. *Small business economics*, *2*(4), 319-330.
11. Ferreira, J. J. M., Fernandes, C. I., &Ratten, V. (2016). A co-citation bibliometric analysis of strategic management research. *Scientometrics*, *109*(1), 1-32.
12. Glänzel, W., Schubert, A., &Czerwon, H. J. (1999). A bibliometric analysis of international scientific cooperation of the European Union (1985–1995). *Scientometrics*, *45*(2), 185-202.
13. Haddad, C., & Hornuf, L. (2019). The emergence of the global fintech market: Economic and technological determinants. *Small Business Economics*, *53*(1), 81-105.
14. Hornuf, L. (2016). *The emergence of the global fintech market: Economic and technological determinants* (No. 201606). Institute of Labour Law and Industrial Relations in the European Union (IAAEU).
15. Hsiao, C. H., & Yang, C. (2011). The intellectual development of the technology acceptance model: A co-citation analysis. *International Journal of Information Management*, *31*(2), 128-136.
16. Li, X., Yuan, J., Shi, Y., Sun, Z., &Ruan, J. (2020). Emerging Trends and Innovation Modes of Internet Finance—Results from Co-Word and Co-Citation Networks. *Future Internet*, *12*(3), 52.
17. Lisée, C., Larivière, V., & Archambault, É. (2008). Conference proceedings as a source of scientific information: A bibliometric analysis. *Journal of the American Society for Information Science and Technology*, *59*(11), 1776-1784.
18. Merigó, J. M., & Yang, J. B. (2017). A bibliometric analysis of operations research and management science. *Omega*, *73*, 37-48.
19. Pan, C. L., Chen, X., Lin, M., Cai, Z., & Wu, X. (2020). Financial industry under the background of digital industry: A Bibliometric Analysis of Related Research. In *E3S Web of Conferences* (Vol. 214, p. 03010). EDP Sciences.

ISSN: 0976-5301
Peer Reviewed & Refereed Journal
Journal Website www.coherencejournal.in

20. Persson, O., Danell, R., & Schneider, J. W. (2009). How to use Bibexcel for various types of bibliometric analysis. *Celebrating scholarly communication studies: A Festschrift for Olle Persson at his 60th Birthday*, *5*, 9-24.

21. Schildt, H. A., Zahra, S. A., &Sillanpää, A. (2006). Scholarly communities in entrepreneurship research: A co–citation analysis. *Entrepreneurship Theory and Practice*, *30*(3), 399-415.

22. Shiau, W. L., Chen, S. Y., & Tsai, Y. C. (2015). Management information systems issues: co-citation analysis of journal articles. *" International Journal of Electronic Commerce Studies"*, *6*(1), 145-162.

23. Tight, M. (2008). Higher education research as tribe, territory and/or community: A co-citation analysis. *Higher Education*, *55*(5), 593-605.

24. Walter, C., &Ribière, V. (2013). A citation and co-citation analysis of 10 years of KM theory and practices. *Knowledge Management Research & Practice*, *11*(3), 221-229.

25. Wang, N., Liang, H., Jia, Y., Ge, S., Xue, Y., & Wang, Z. (2016). Cloud computing research in the IS discipline: A citation/co-citation analysis. *Decision Support Systems*, *86*, 35-47.

26. Wu, P. S. (2017, December). Fintech trends relationships research: A bibliometric citation meta-analysis. In *Proceedings of the 17th International Conference on Electronic Business, ICEB, Dubai, UAE* (pp. 99-105).