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A SCIENTOMETRIC STUDY OF INTER-FIRM INFORMATION EXCHANGE IN MANAGEMENT AND INFORMATION SYSTEM JOURNAL

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Abstract: *Information exchange is an emerging research issue especially in supply chain setting. Among the research, it is found that it works as business type of research and information management type of research. Due to the practicality and interdisciplinary relevance of this issue, the structured discourse information is needed. In this paper we used scientometric technique to study information exchange topic which communicated through journals. We used 32 journals articles published in leading journals from 2001 – 2017 periods. Beside the topics, we analysed the position of paper published (information system and business management), the most influence articles and journals and, the most productive authors. Lastly we analyse the composition of articles and industry involved.*

Keywords: *Information Exchange, Supply Chain, Scientometric*

Introduction

Information exchange is an emerging research issue especially in supply chain management. Information exchange is referred to the extent to which information is shared or being communicated between a focal firm and it supply chain partners which is critical and proprietary in nature (Lee et al., 2010, Lin and Lin, 2006). Among the researches related to this topic, it is found that, it works as business type of research and information management research. Due to the practicality and interdisciplinary relevance of this topic, the structures discourse information is needed. The scientometric study is one of the techniques to provide the information.

Scientometic study is referred as science about science (Lowry et al., 2007) or research on research (Madlberger & Roztocki, 2009). Scientometric or quantitative studies of research (Lowry et al., 2007) are considered valuable (Straub, 2006) when, a researcher can examine

how researchers in certain field pursue their scientific research and publication. Although, there are scientometric studies on research publication in the field of information system such as exploring the management information system discipline (Cocosila et al., 2011), knowledge management and intellectual capital (Serenko et al., 2010) and Biophotonics information (Ruas et al., 2017), however the scientometric study on publication specifically focused on the information exchange in supply chain is sparse.

The main objective of this scientometric study is to understand the scientific discipline by examining the characteristics of papers related to information exchange in the supply chain domain published in established journals. In specific, our objectives are to investigate the most published type of journals for information exchange in supply chain domain, to access the most influential papers under the domains and to examine the most productive authors, author composition and industry.

The rest of this paper is organized as follows. After explaining the methodology of scientometric study, we discuss the article collection procedure and then present sample papers. The papers are then examined from the most published type of journals, the most influential paper and journals and the most productive researchers. After that, the discussion on the author composition and industry involved. After interpreting the result of our analysis, we then discuss several key implications and observations. Subsequent to the limitation of the current study we summarize our contribution and then we conclude our paper.

Methodology

The scientometric technique for this study is adapted from Maldberger and Roztocki (2009) consist four steps. First we searched the articles using predetermined words. Then we grouped the articles into the types of journal whether information system or business management. Step 3 we analysed our sample based on determined objectives. Finally we communicated the key observation and discussed the contributions of the study.

Selection of Papers

The objective of our research is to examine publication on the topic of information exchange in supply chain setting. So, similar to Maldberger and Roztocki (2009), we start our research with papers published in refereed journal listed in top publisher database such as Emerald Publishing, Elsevier, Sage Publication, Springer and Taylor and Francis. Based on Lee et al. (2010) and Lin and Lin (2006) works, we choose two key words in searching process. The words were “Information exchange”, and “information sharing”. Searching engine used was Google Scholar because the ability of this search engine to list of journal article under different database and publisher. In the filtering process, basically we apply the following questions:

Is the paper listed in Google Scholar is refereed journal article under the above publishers?

Does the paper examine the information exchange at firm level?

Does the paper discuss the relationship between firm and their partner in supply chain?

To be included as samples, all three questions need to be answered with "Yes". Then the result from the above selection criteria, we conducted a full text review of all papers from 2001-2017 periods.

Paper Grouping

The specific objective of our scientometric study is to examine what type of journal the topic published most, the most influence paper and most productive researchers. Thus, to achieve these objectives, we grouped the papers into two types of journal which were; information system and business management related journal. Information system journal is referred as any journal that focuses on publishing information related issues, meanwhile business management journal is referred as journals that published business related issues. Together within the grouping process, we recorded citation number for each paper until current date. Among the refereed journals listed are Decision Support System, Management Information System Quarterly, Journal of Management Information System, Journal of Information System, Journal of Information Management and International Journal of Physical, Distribution and Logistics Management.

Analysis

The method for analysis was adapted from past scientometric studies (Maldberger & Roztocki, 2009; Clark et al., 2009). Referring to other similar study in Maldberger and Roztocki (2009), our analysis started by examining the research topic and keywords and then assigning them to information system or business management type of journal. Next, sample analysis for productivity of individual researchers under the topic took place. For this purpose, we adapted Clark et al. (2007) approach. Lastly, we examine the most influential papers by observing the most cited paper by Google Scholar until the date of October 2017. Next, for composition of authors we sort the authors into international, cross university, same university and sole author categories. Lastly, we grouped the articles into manufacturing and service sector based on their industry data involved.

Result

In this section the result from the analysis are presented and discussed.

Papers Included in the Sample

The data collection resulted from 32 articles published in various refereed journal. The papers in our sample are listed in the Table 1.

Table 1: The Journal Sample

Authors	Journals	Bus. M'gment	Info. System
Lee et al. (2010)	International Journal of Production Research (IJPR)	/	
Kauffman & Mohtadi (2004)	Journal of Management Information System (JMIS)		/
(Li, 2002)	Management Science Journal (MS)	/	
Potterfield et al. (2010)	International Journal of Physical, Distribution and Logistic Management (IJPDLM)	/	
Moberg et al. (2002)	International Journal of Physical, Distribution and Logistic Management (IJPDLM)	/	
Tai & Ho (2010)	Industrial Management and Data System (IMDS)		/
Goo & Huang (2008)	Decision Support System (DSS)		/
Cheikhrouhou et al. (2013)	International Journal of Computer Integrated Manufacturing (IJCIM)		/
(Zhou & Benton, 2007)	Journal of Operation Management (JOM)	/	
Zailani et al. (2008)	Operational Supply Chain Management (OSCM)	/	
Cheng (2011)	International Journal of Information Management (IJIM)		/
Ramayah & Omar (2010)	International Journal of Information Technology and decision Making (IJITDM)		/
Omar et al. (2010)	African Journal of Business Management (AJBM)	/	
Cheng & Fu (2013)	International Journal of Information Management (IJIM)		/
Baihaqi & Sohal (2012)	Production Planning and Control (PPC)	/	
Samaddar et al. (2006)	European Journal of Operation Research (EJOR)	/	
Li et al. (2006)	Decision Support System (DSS)		/
Wu et al. (2014)	International Journal of Production Economy (IJPE)	/	
Rai et al. (2006)	Management Information System Quarterly (MISQ)		/
(Khan, Hussain, & Saber, 2016)	International Journal of Production Economic (IJPE)	/	
Fiala (2005)	International Journal of Management Science (IJMS)	/	
Lin & Lin (2006)	Decision Support System (DSS)		/
Kim et al. (2005)	Journal of Information System (JIS)		/
Patnayakuni et al. (2006)	Journal of Information System (JIS)		/
Raghunathan & Yeh (2001)	Information System Research (ISR)		/
(Raghunathan, 2001)	Management Science Journal (MS)	/	
Sahin & Robinson (2002)	Decision Science (DS)		/
Cheng & Wu (2005)	Journal of the Operational Research Society (JORS)	/	
Klein & Rai (2009)	Management Information System Quarterly (MISQ)		/
Yu et al. (2001)	Industrial Management & Data System IMDS		/
(Yu, Yan, & Cheng, 2002)	Journal of the Operational Research Society (JORS)	/	
(Mohtadi & Kinsey, 2005)	American Journal of Agricultural economic (AJAE)	/	

The result from Table 1 shows 16 papers in sample that are related to the information system and listed under information type of journals. The rest of the papers were published under business management journal. Analysis based on the journal shows that there are 3 articles published in DSS journal, while IJIM, JIS, IMDS and MISQ published 2 papers each.

The rest with 1 paper each. For business management related journal, only IJPDLM and MS published 2 papers while the rest with only 1 paper each.

Most Productive Authors

Structural analysis of all 32 papers shows that only 2 papers was written by a single author while the remaining with co-author: 14 papers had 2 authors and 16 had more than 2 authors. For the whole 32 papers 85 authors involve. The analyses of the most productive author by journal reveal that MISQ show the highest density of co-authored by productive authors. Meanwhile, DSS and JMIS considered productive journal when they published more papers under the topic. Table 2 shows the most productive co-author and author.

Table 2: Most Productive Authors

Authors	Number of Papers	Journal
Rai, A	4	MISQ
Patnayakuni, R	2	MISQ
Lin, B	2	DSS
Cheng, T-H	3	IJIM
Ramayah, T	2	AJBM & IJITDM
Omar, R	2	AJBM & IJITDM
Raghunathan, S	3	MISQ, ISR &MS

Most Influential articles

Next we analysed the most influential authors or papers until the date of October 2017. This category has been chosen as it represents the most cited paper counted by Google Scholar. Table 3 represents the most cited paper and their publication. The findings show that papers written in information system type of journal were cited most. From 8 papers received high number of citation, 5 coming from information type journal and 3 from business management type of journal.

Table 3: Most Cited Papers

Authors	Journal	Cited number (Oct, 2017)
Rai et al. (2006)	MISQ	1371
Sahin & Robinson (2002)	DS	762
Lin & Lin (2006)	DSS	691
Li (2002)	MS	622
Fiala (2005)	IJMS	486
Moberg et al. (2002)	IJPDLM	367
Patnayakuni et al. (2006)	JMIS	353
Klein & Rai (2009)	MISQ	313

Composition of the Authors

Analysis on the author composition as in Table 4, it is found that majority of articles written by cross university authors for both journal types. For example, 7 articles in business management journals and 9 in information system journals. It shows that, the articles under

information exchange topic involved collaboration work between universities and it is good to have collaboration for the article to be published.

Table 4: Composition of Authors

Journal Type	International	Cross University	Same University	Sole Author	Total
Business Management Journal	2	7	4	3	16
Information System Journal	1	9	5	1	16
Total	3	16	9	4	32

Finally, we analysed the most focused industry for information exchange in supply chain topic as depicted in Table 5. The result shows that most articles emphasis on manufacturing supply chain setting compare to service supply chain when 29 of 32 articles used data from manufacturing sector. It gives implication that research on information exchange in service industry is limited in terms of number.

Table 5: Industries

Authors	Manufacturing	Service
Lee et al. (2010)	/	
Kauffman & Mohtadi (2004)	/	
(Li, 2002)	/	
Potterfield et al. (2010)	/	
Moberg et al. (2002)	/	
Tai & Ho (2010)	/	
Goo & Huang (2008)		/
Cheikhrouhou et al. (2013)		/
(Zhou & Benton, 2007)	/	
Zailani et al. (2008)	/	
Cheng (2011)	/	
Ramayah & Omar (2010)	/	
Omar et al. (2010)	/	
Cheng & Fu (2013)	/	
Baihaqi & Sohal (2012)	/	
Samaddar et al. (2006)	/	
Li et al. (2006)	/	
Wu et al. (2014)	/	
Rai et al. (2006)	/	
(Khan et al., 2016)	/	
Fiala (2005)	/	
Lin & Lin (2006)	/	
Patnayakuni et al. (2006)	/	
Raghunathan & Yeh (2001)	/	
(Raghunathan, 2001)	/	
Sahin & Robinson (2002)	/	
Cheng & Wu (2005)	/	
Klein & Rai (2009)	/	
Carr & Kaynak (2007)	/	
Yu et al. (2001)	/	
Yu et al. (2002)	/	
Mohtadi & Kinsey (2005)		/
TOTAL	29	3

Limitation

There are several limitations in our study. Firstly, the conclusion is based on 32 journals articles under the topic of information exchange in supply chain. Analysis with larger sample size would provide a more complete picture of the academic discourse.

Second limitation is related to the duration of our investigation. Our results are limited to the papers from 2001 to 2017. Earlier publication should be taken into account to achieve deepest insight into the topic. Third limitation is that in this study, we did not measure paper distributions by journal and years due to small sample which could be addressed for future studies.

Contribution and Conclusions

In conclusion, it is believed that this paper made several contributions. First, the scientometric analysis in this study is perhaps the first study on the topic of information exchange in supply chain setting. Second, our list of productive gurus may benefit others researchers interested towards the topic and domain. Third, the analysis of journal publication could help the researchers to identify suitable places to publish their work under the similar topic. Lastly, analysis related to industries shows that research about information exchange in service industry especially in service supply chain setting is still limited.

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