Exploring the Distinction between Knowledge Transfer and Knowledge Sharing by Bibliometric Method

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***Abstract*—Focusing on the diffusion and growth of knowledge management research, this study aims to investigate the difference between two blurry terms in knowledge management area—knowledge transfer and knowledge sharing and describe the characteristics by bibliometric method. The relative literature is collected by looking into the Social Science Citation Index (SSCI) of ISI Web of knowledge database. Implementing the comparison of publication year, citation, institute, publication sources and subject area, this study tries to discover the underlying difference between knowledge transfer and knowledge sharing articles. This study presents a view of quantitative through bibliometric method and provides researchers with new insights for future applied research by a comprehensive taxonomy of knowledge management research.**

***Index Terms*—bibliometric analysis, knowledge management, knowledge sharing, knowledge transfer**

I. Introduction

In the area of knowledge management (KM) research, knowledge is conceived an object that can and should be managed [1], [2]. Also, Knowledge in the practice has been considered as a competitive advantage [3] and a valuable organizational property strategically [4] in industry environment. Since Polanyi [5] discussed the distinction between explicit and tacit knowledge, researchers in this area described the KM framework by developing a series of management definitions, concepts, activities, stages, circulations, and procedures. Thus, the subsequent research grew in KM publications at a rate of almost 50% per year in last decade [6], [7]. A study of research published in 11 key KM journals identified 3,109 unique authors affiliated with 1,450 institutions between 1994 and 2008 [8].

Since KM is still considered to be in its embryonic stages [8], a taxonomy with clear concepts and terms is necessary for the development of this area. As the study of Paulin and Suneson [9] mentioned, sometimes knowledge transfer (KT) is used interchangeably with knowledge sharing (KS) [10]. Therefore, to understand the research stream of KT and KS and to figure out their distinction is important for the academic and practical progress of KM. Paulin and Suneson [9] discussed this issue by reviewing a series of research regarding KT and KS to explore their difference in evolution of development. In addition, their study also suggests the difference is derived from the basic view of knowledge. Since their study conducted an initial investigation on this problem and possessed a great finding. This study, based on their work, implements a set of bibliometric analysis including publication year, citation, institute, published source and subject area to further discover the underlying difference between KT and KS research.

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II. Methodology

The bibliometric method is a statistical method of bibliography counting to evaluate and quantify the growth of literature of a subject. Broadus [11] defined bibliometrics as "the quantitative study of physical published units, or of bibliographic units, or of the surrogates for either." Bibliometric methods have been used mainly by information scientists to study the growth and distribution of the scientific article. The bibliographic information usually include the journal or other publication title, the authors' name and affiliation, document type, the language of the original document, etc. The Thomson Reuters' Citation database of Social Sciences Citation Index (SSCI) on ISI Web of Knowledge website was used to retrieve data for this study. The Social Sciences Citation Index is a multidisciplinary index to the journal article of the social sciences. It fully indexes over 1,950 journals across 50 social sciences disciplines. It also indexes individually selected, relevant items from over 3,300 of the world's leading scientific and technical journals. In this study, we discuss the papers published in the period from 1973 to 2013 because there was no data prior to that year. The query for general search was performed with keywords as knowledge transfer and knowledge sharing, 2359 and 1404 bibliographic records were retrieved. There are only 124 records overlapping between KT and KS in this database and have been excluded from the analysis of this study.

III. Research Finding and Discussion

A. Literature Growth

By searching the database of SSCI, 2359 (KT) and 1404 (KS) bibliographic records were retrieved. After summarizing the collected data, the publication growth of

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KT and KS shows in Fig. 1. Research about KS is much later than KT in SSCI database. First article of KS was published in 1990 and the KT article was first shown in 1973. Despite the confusion of these two terms that were mentioned in the study of Paulin and Suneson [9], "knowledge transfer" is earlier and more popular than "knowledge sharing" in the research trends. Although the published amount may float in certain year, the tendencies of these two kinds of literature growth increase steadily. This may indicate the KM area draws more and more attention from researchers.

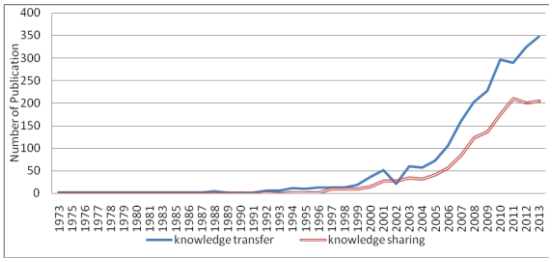

Figure 1. The tendency chart of publication growth of KT and KS

TABLE I. COUNTRY DISTRIBUTION (TOP 10)

Ranking	Knowledge Transfer		Knowledge Sharing	
1	USA	699	USA	401
2	England	376	Taiwan	192
3	Canada	304	England	164
4	Germany	174	Peoples R China	118
5	Netherlands	125	Netherlands	74
6	Spain	115	Australia	73
7	Australia	111	Canada	70
8	Peoples R China	111	South Korea	59
9	Taiwan	78	Germany	41
10	Italy	74	Singapore	38
% of all		91.8		87.6

TABLE II. LANGUAGE DISTRIBUTION

Ranking	Knowledge Transfer		Knowledge Sharing	
1	English	2291	English	1374
2	German	43	Portuguese	12
3	Spanish	13	German	6
4	French	6	Spanish	5
5	Portuguese	2	French	2
6	Norwegian	1	Turkish	2
7	Croatian	1	Chinese	1
8	Czech	1	Russian	1
9	Russian	1	Slovak	1

B. *Country and Language Distribution*

There are 91 (KT) and 79 (KS) countries publishing KT and KS relevant literature. Table I lists the top ten countries. In KT, it was published in the USA about 29.63%. England (15.94%) and Canada (12.89%) contribute the second and third. On the contrary, research about KS was published in the USA about 28.56%. Taiwan (13.68%) and England (11.68%) contribute the second and third. The last raw of Table I shows the percentage of top 10 countries totally publishing. The researchers' contribution in these countries not only indicates that the related topics about knowledge management have drawn attention from the world, but also reveals the difference of KT and KS. Comparing the results of country distribution, the difference between KT and KS is obvious. Researchers in Asian, especially Chinese authors (Taiwan and PRC) are presented highly interested in knowledge sharing issue.

Table II shows the languages that contribute in this domain. English language articles constitute 97.86% and 97.10% of KT and KS research. The reason for the result may be because the literature source was an English database, and English was the official language for most journals and international conferences.

TABLE III. DISTRIBUTION OF TOP 20 SUBJECTS AREA

	Knowledge Transfer			Knowledge Sharing		
Ranking	Subject area	NP	% of 2359	Subject area	NP	% of 1404
1	Management	1006	42.65	Management	530	37.75
2	Business	528	22.38	Information science library science	394	28.06
3	Information science library science	240	10.17	Computer science information systems	202	14.39
4	Operations research management science	156	6.61	Business	195	13.89
5	Engineering industrial	140	5.94	Operations research management science	103	7.34
6	Planning development	124	5.26	Education educational research	101	7.19
7	Economics	107	4.54	Computer science interdisciplinary applications	71	5.06
8	Computer science information systems	103	4.37	Engineering industrial	70	4.99
9	Education educational research	102	4.32	Psychology multidisciplinary	59	4.20
10	Public environmental occupational health	94	3.99	Computer science artificial intelligence	51	3.63
11	Health care sciences services	82	3.48	Ergonomics	44	3.13
12	Psychology applied	78	3.31	Psychology applied	43	3.06
13	Environmental studies	77	3.26	Computer science cybernetics	41	2.92
14	Geography	74	3.14	Environmental studies	38	2.71
15	Health policy services	74	3.14	Economics	35	2.49
16	Rehabilitation	73	3.10	Engineering multidisciplinary	31	2.21
17	Nursing	54	2.29	Planning development	31	2.21
18	Social sciences interdisciplinary	52	2.20	Psychology experimental	29	2.07
19	Engineering multidisciplinary	50	2.12	Communication	27	1.92
20	Computer science interdisciplinary applications	39	1.65	Health care sciences services	27	1.92

C. Subject Area

Table III demonstrated critical information of the top 20 subject areas of KT and KS. The top three subjects for knowledge transfer research domains are Management (1006 articles, 42.65%), Business (528 articles, 22.38%), Information science library science (240 articles, 10.17%). On the other hand, the top three knowledge sharing research domains are Management (530 articles, 37.75%), Information science library science (394 articles, 28.06%), Computer science information systems (202 articles, 14.39%).

Since KT and KS research are both related to KM, the "Management," no doubt, possesses the highest ranking subject. "Information science library science" is also the popular area that KT and KS research covered. However, about 14% KS researches belong to "Computer science information systems" subject. It may show the researcher of information system involved in the knowledge sharing topics. Besides, this result of analysis also indicates the popular domains and potentially growing subjects.

D. Publication Source

Table IV shows the information of top 20 publication sources on research trends of KT and KS. The top three journal published KT articles are Research policy (46 articles, 1.95%), British journal of occupational therapy (42 articles, 1.78%), International journal of technology management (42 articles, 1.78%). In addition, Journal of international business studies, Journal of knowledge management, Organization science are published the same amount articles with ranking 2 and 3.

TABLE IV. TOP 20 PUBLICATION SOURCES

	Knowledge Transfer			Knowledge Sharing		
Ranking	Sources title	NP	% of 2359	Sources title	NP	% of 1404
1	Research policy	46	1.95	Journal of knowledge management	68	4.84
2	British journal of occupational therapy	42	1.78	Knowledge management research practice	37	2.64
3	International journal of technology	42	1.78	Computers in human behavior	29	2.07
4	Journal of international business studies	42	1.78	International journal of information management	27	1.92
5	Journal of knowledge management	42	1.78	Expert systems with applications	24	1.71
6	Organization science	42	1.78	Journal of information science	24	1.71
7	Strategic management journal	40	1.70	Computers education	21	1.50
8	Journal of management studies	34	1.44	Information management	20	1.43
9	Technovation	33	1.40	Decision support systems	19	1.35
10	International business review	32	1.36	International journal of human resource management	18	1.28
11	International journal of human resource management	27	1.15	African journal of business management	17	1.21
12	Management science	25	1.06	Behaviour information technology	17	1.21
13	Implementation science	24	1.02	Electronic library	15	1.07
14	Journal of technology transfer	21	0.89	Industrial management data systems	14	1.00
15	Journal of world business	21	0.89	International journal of human computer studies	14	1.00
16	Academy of management journal	19	0.81	Online information review	14	1.00
17	Industrial marketing management	19	0.81	Social behavior and personality	14	1.00
18	Scientometrics	18	0.76	International journal of technology management	13	0.93
19	Journal of business research	17	0.72	Aslib proceedings	11	0.78
20	Journal of product innovation management	16	0.68	Ieee transactions on engineering management	11	0.78

On the contrary, the top three journal that published KT articles are Journal of knowledge management (68 articles, 4.84%), Knowledge management research practice (37 articles, 2.64%), Computers in human behavior (29 articles, 2.07%). The distribution of publication sources in KS research is more centralizing than KT research. Comparing ranking and percentage, the result reveals that KS research published on KM journal more than KT research. This indicates the topics of KS research are more related to KM and the KT research is dealing with topics more general and interdisciplinary.

E. Keywords

Besides the subject area analysis, this study also conducted the keyword analysis. Numbers of keyword from literatures not only reflect the research topic, but also provide a convenience way to search and retrieval. The top 15 keywords of KT and KS are shown in Table V. By observing the most commonly used keywords, the hot research issues from past research are identified clearly. In addition, for more understanding and comprehensive, this study conducted an analysis of important keywords by visualization tool – CiteSpace. CiteSpace is a biblometric tool that can visualizing patterns and trends in scientific literature.

For more comprehensive, this analysis includes the author keywords and title information from each article to identify the most popular terms mentioned by KT and KS research. This result provides a reference to figure out the area or discipline that KT and KS research addressed.

According to the results of clustering analyses (see Fig. 2), the cluster blocks in KS research is more centralized

than KT research. Since each cluster block represents the close connection among articles and the research in KT is much divergence than KS research. This indicates the generalization of research area in KT and consistent with the results mention above. Fig. 3 shows timeline of most frequent keywords used by KT and KS research separately and lists the terms that referred these keywords at the right part of figures. The longer timelines of KT and the more nodes spread on its figure represent that KT research has longer history and more publication. Top 5 of the terms that related to most frequent keywords of KT and KS are listed in Table VI.

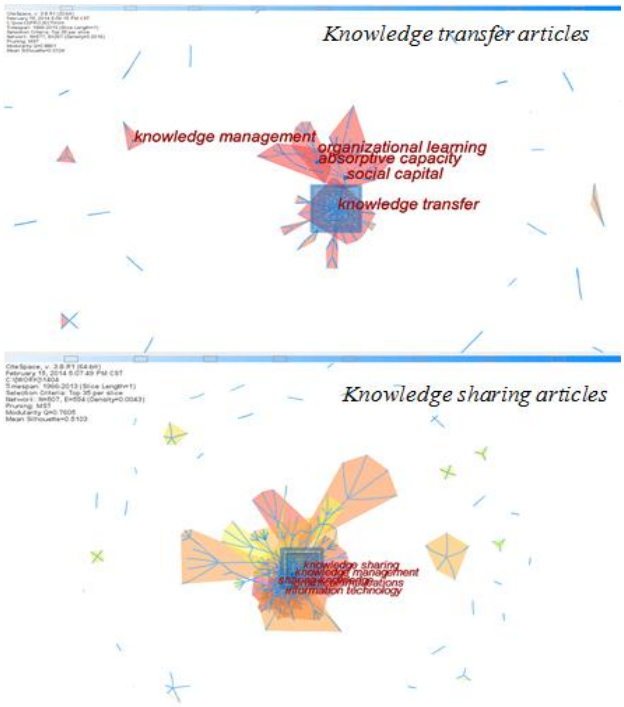

Figure 2. The clustered bibliographic spanning tree of KT and KS articles

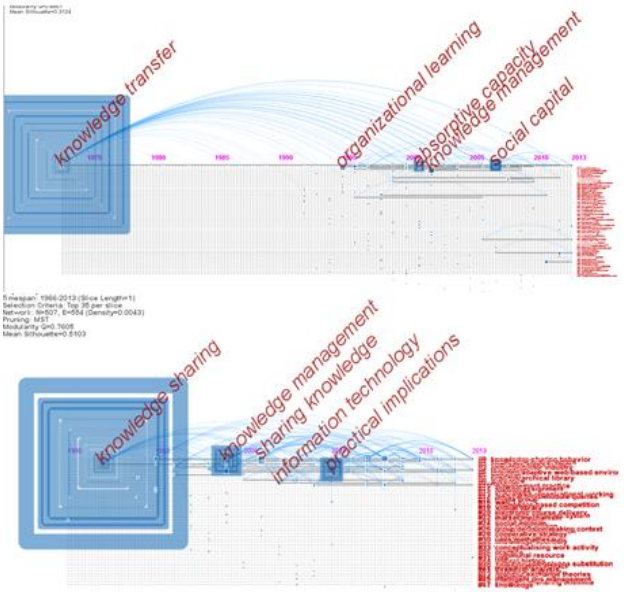

Figure 3. The timeline of keywords with the frequented terms on KT and KS research

TABLE V. TOP 20 KEYWORDS

	Knowledge Transfer			Knowledge Sharing		
Ranking	Keyword	NP	% of 8964	Keyword	NP	% of 2360
1	Knowledge transfer	709	7.91	Knowledge sharing	211	8.94
2	Knowledge management	133	1.48	Knowledge management	75	3.18
3	Innovation	97	1.08	trust	20	0.85
4	absorptive capacity	65	0.73	innovation	17	0.72
5	knowledge	53	0.59	communities of practice	15	0.64
6	Organizational learning	52	0.58	Social capital	13	0.55
7	Social capital	49	0.55	Organizational culture	10	0.42
8	Technology transfer	48	0.54	social media	10	0.42
9	Learning	47	0.52	Malaysia	9	0.38
10	China	46	0.51	case study	9	0.38
11	performance	34	0.38	Knowledge creation	9	0.38
12	networks	33	0.37	Knowledge-sharing	9	0.38
13	Social networks	32	0.36	Knowledge	8	0.34
14	Trust	29	0.32	Collaboration	8	0.34
15	Research	28	0.31	Web 2.0	8	0.34
16	evidence-based practice	28	0.31	motivation	8	0.34
17	knowledge translation	26	0.29	China	8	0.34
18	Tacit knowledge	24	0.27	leadership	8	0.34
19	knowledge exchange	22	0.25	tacit knowledge	6	0.25
20	strategic alliances	22	0.25	virtual community	6	0.25

TABLE VI. TOP 5 TERMS RELATED TO MOST FREQUENT KEYWORDS

Ranking	Knowledge Transfer	Knowledge Sharing
1	Information	Knowledge Sharing behavior
2	Firm performance	Knowledge management
3	Organizational learning	Computer-aided system
4	Empirical investigation	Semiconductor industry
5	Managing knowledge transfer	Leadership

IV. CONCLUSION AND CONTRIBUTION

This study aims to investigate the difference between two blurry terms in knowledge management area—knowledge transfer and knowledge sharing by searching the SSCI database, and examined some literature characteristics in terms of bibliometric techniques.

According to the results, several findings are summarized as followings: First, knowledge management is regarded as a more and more important issue because the increasing volume of relevant researches (knowledge transfer and knowledge sharing) in recent years. In knowledge transfer and knowledge sharing research, the USA's publication has advantage of large amount than other countries and the mainly concerned subject area is "Management".

Second, inspired by the work of Paulin and Suneson [9], this study conducted a further comparison of knowledge transfer and knowledge sharing research. The results reveal knowledge transfer emerged earlier and has a more general scope that covered multidisciplinary subjects and knowledge sharing is more focusing on the knowledge management context and more specifying the application of information systems. Unlike the views of

philosophy that is studied by Paulin and Suneson, this study implements the comparison through quantitative aspect and conducts a series of biliometric analyses. The finding of this study not only goes further beyond prior studies, but also explores more detail information underlying the large volume of bibliographic data. Moreover, the utilization of visualized tool leads the translation and demonstration of results more understandable and attractive.

Finally, this study has provided researcher who is interested in this area useful information to figure out the usage of terminology and to focus on the proper and potential subjects. Nevertheless, this study analyzed bibliography data by taking advantage of ISI SSCI database and left a set of excluded data which contain 124 bibliography records. Although the amount of data is relatively less and may not result in significant deviation, this set data still needs further scrutinize to identify their position. This study focuses on knowledge transfer and knowledge sharing and retrieves data to conduct biliometric analyses. However, as the study of Serenko *et al.* [8] mentioned: "KM is still considered to be in its embryonic stages, with much more growing up left to do." More effort could be placed on further analysis such as co-citation to get deeper comprehension or discovery for further details of KM research in future research.

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