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Knowledge management within a strategic alliances context: past, present and future

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# **Knowledge Management within a Strategic Alliances Context: Past, Present and Future**

## **Abstract**

**Purpose** – This paper aims at reviewing the extant knowledge management (KM) research field within a strategic alliance context to understand the historical roots, its temporal progression, current state and potential future in a meaningful way.

**Design/methodology/approach** – Data for this study was retrieved from the Scopus database using a systematic literature search process. The bibliometric characteristics of 393 research documents were analyzed using bibliometric and structured network analysis.

**Findings** – The findings of the study suggest that the publication in the field have been growing with an average rate of 8.48 percent. This analysis also lists the most productive and impactful authors, main outlets, and the most impactful secondary and primary publication in the field. In addition, the conceptual and intellectual structure of the research field was constructed and discussed.

**Originality/value** – This paper employs an objective and quantitative approach by reviewing the related publications and virtually included all the relevant publications in the analysis, which was seen to be uneconomical when doing traditional literature reviews.

**Keywords:** Knowledge Management, Strategic Alliance, Joint Venture, Knowledge transfer, Organizational Learning, Bibliometric Analysis, Co-citation, Bibliographic coupling

**Paper type** Critical review

# **Knowledge Management within a Strategic Alliances Context: Past, Present and Future**

## **1. Introduction**

Business challenges such as technological disruptions, regulatory challenges, demographic shifts, global political conflicts etc., are pushing organizations to collaborate strategically more than ever before (Das and Teng, 2000; Gomes, 2020; Kate, 2020). Key examples of such recent strategic collaborations are: Haven, as an alliance by firms Amazon, Berkshire Hathaway, and JPMorgan in the US; Maruti Suzuki with Toyota Motors in India; Hewlett-Packard and Disney; Toyota Motors and Microsoft' Starbucks and Nestle- to name a few. Over the past few years, firms are forming strategic alliances with those having diverse backgrounds, for key strategic reasons such as to acquire new resources and capabilities, skills and knowledge, access to new market, diversify a firm's product portfolios etc., (Gnyawali and Charleton, 2018; Ko et al., 2020; Saada and Gomes-Casseres, 2019; Collins and Riley, 2013). Thus, forming a strategic alliance to achieve competitive advantage remains a key strategy for many firms (Eisenhardt and Schoonhoven, 1996). Due to its attractiveness and proven mutual benefits the phenomenon (entering in to strategic alliances) is thus growing substantially. A recent global CEO survey substantiates this view as forty-nine percent of the survey participants reported that to drive firm growth, their firms are planning to enter into a strategic alliance (PwC, 2020; 23<sup>rd</sup> annual global CEO survey).

Strategic alliances may be understood as a “voluntary, cooperative inter-firm agreements, primarily aimed at achieving mutual competitive advantage” (Das and Teng, 2000, p. 33). The long-time investigation of enquiring reasons and rationale for why do firms enter in to strategic alliances and its emergence, may be attributed to success of external collaborative method of growth and development (Chiao, Lo, & Yu, 2010). In recent years, popularity of the theoretical lens of the resourcebase view of the firm in studying strategic alliance also increased the legitimacy of external collaborative method of growth over internal growth strategies such as the transaction cost economies etc. (Eisenhardt and Schoonhoven, 1996; Das and Teng, 2000).The resource base view suggests that a firm is a set of uniquely possessed resources (tangible and intangible) and these resources would determine a firm's competitive advantage (Barney, 1991). It postulates that the essence of external collaboration/alliances primarily lies

within the premises of strategic and social factors, firm characteristics, needs and opportunities (Eisenhardt and Schoonhoven, 1996). Through entering into strategic alliances, firms acquire the resources which are considered as critical to drive corporate growth and profitability as per its needs and opportunities (Hagedoorn et al., 2018). The inter-organizational transactions of resources build organizational capabilities needed to capitalize on the opportunities or even changing business challenges (Del Giudice and Maggioni, 2014). Another example, is during the 2008 financial crisis firms invested in strategies that included identifying strategic business partners as agility strategies (Pereira et al., 2020, forthcoming).

Knowledge is considered as key among those critical resources and studies have highlighted the importance of firm-specific knowledge in realizing firm strategy (Spender and Grant, 1996). The knowledge-based view of the firm posits that firm possessed knowledge is usually socially complex and difficult to imitate, thus leading to sustainable competitive advantage (Alavi and Leidner, 2001). One important source for creating or acquiring firm specific knowledge is entering into strategic alliances (Inkpen and Dinur, 1998) as such inter-organizational arrangements are a useful tool for filling the internal knowledge gaps in critical areas (Madhok, 1997; Mojica et al., 2018). Thus, strategic alliances are an important vehicle through which firms could gain access to new knowledge, learn new things and thus enhances their strategic position in a competitive landscape (Kogut 1988; Eisenhardt and Schoonhoven, 1996; Das and Kumar, 2007).

Following the assumption that getting access to new knowledge and organizational learning is an important motive of strategic alliance formation, there is a growing body of research addressing the issue of knowledge management in inter-organizational context (Faems et al., 2020; Mills et al., 2002). This body of research though is highly fragmented, incoherent, heterogeneous and narrowly focused (Agostini et al., 2020; Meier, 2011). For example, multistep knowledge transfers in multinational companies' network (Faems et al., 2020); knowledge transfer in developed-developing country inter-firm collaborations (Narteh, 2008); role of knowledge in alliance performance (Gravier et al., 2008); knowledge sharing and collaborative innovation (Connell et al., 2014); knowledge ambiguity in strategic alliances (Ho et al., 2019), are a case in point and few examples. There is thus a pressing need to conduct a holistic and inclusive review which would offer a comprehensive understanding of knowledge management in the context and perspective of strategic alliance. This paper thus responds to this gap by critically reviewing the relevant extant literature, utilizing a robust objective and

scientific method i.e. bibliometric and structured literature network analysis More specifically, this paper addresses the following two important questions:

*Research question 1:* what is the current state of affairs and the general description and publication trends when it comes to the topic of ‘research on knowledge management in a strategic alliance context’ i.e. where are we?

To address this research question, a general description of the research stock i.e. annual publication trends, most productive authors with their impact, university departments, most cited individual works, and most relevant publication outlet i.e. journal and so on are identified and discussed.

*Research question 2:* what is the existing knowledge structure (conceptual structure (2a) and intellectual structure (2b)) of KM research in a strategic alliance context, and where is this headed?

To address the second research question, we have constituted the strategic diagram, Sankey diagram, co-citation network, and bibliographic network and discussed aspects of these.

By answering the above questions, this paper aims to contribute to the KM research in strategic alliance context literature in two pivotal ways. First, familiarity about important trends such as the most productive authors, most influential work and source etc. would help in understanding the role of influential ideas and forces in promoting the knowledge management field. Second, the network analysis would divulge the evolution of the research base historically as well as suggests the potential for future directions. The paper is structured as follows. The next section critically reviews the relevant existing literature which is followed by our methodology, results and discussion and concluding remarks.

## **2. Literature Review**

Knowledge management (Ferreira et al., 2018) and strategic alliance (Debellis et al., 2020) are two extensively researched topics or concepts, researched both independently and jointly (Inkpen and Dinur, 1998; Connell et al. 2014; Ritala et al., 2018). With the advent of the knowledge economy, the concept of knowledge is considered as a primary economic rent generating source (Spender and Grant, 1996; Bernard Nielsen, 2005), primarily to achieve sustainable competitiveness through managing knowledge effectively (Spender and Grant, 1996; Ferreira et al., 2018). It is postulated that knowledge helps organizations in creating firm specific resources and capabilities which in turns generates sustainable competitive advantage

(Alavi and Leidner, 2001; Del Giudice et al., 2017). In contemporary knowledge-based economy, organizations need to adapt to new ways of managing information and knowledge for survival and change management (Paoloni et al. 2020). In this quest of knowledge renewal and new learnings, modern day firms are relying on new strategic tools and governance arrangements, and strategic alliances is one among those governance arrangements that facilitates achieving this objective. Strategic alliances thus facilitate the access, acquisition and assimilation of new knowledge and learning for survival and performance of partner firms (Simonin 2004; Meier, 2010). Therefore, over the past few years research on knowledge management in strategic alliances has grown significantly (Inkpen and Dinur, 1998; Drewniak and Karaszewski, 2019).

Knowledge management is defined as a firm's ability "to create, transfer, assemble, integrate and exploit knowledge assets" (Inkpen, 2000, p. 1020). Although there is no single definition of KM as it has been conceptualized in a variety of ways such as management process, organizational ability and more recently as a type of dynamic capability (Bamel and Bamel, 2018; Obeso et. al., 2020), majorly it is considered as a process that enables firm "to leverage knowledge to enhance competitiveness" (Heisig et al., 2016). It is suggested that an effective KM process includes knowledge acquisition, knowledge creation, knowledge generation, knowledge storing, knowledge sharing, knowledge dissemination and knowledge utilization (Malik et al, 2020).

Historically, examining KM in strategic alliances dates to Weitzel and Andrews (1988) where they examined the development of a knowledge-based product in a joint venture between a university research centre and an insurance firm'. Following this seminal work, various aspects of knowledge management were examined in strategic alliance context. However knowledge transfer and acquisitions remain the primary theme of these examinations. For example, knowledge transfer and learning in international Japanese joint ventures (Richter and Vettel, 1995); knowledge acquisition from foreign parents in a Hungarian context (Lyles and Salk, 1996); strategic alliance and inter-firm knowledge transfer (Mowery and Oxley, 1996); the knowledge transfer process (Inkpen and Dinur, 1998); disseminative capacity and knowledge acquisition (Minbaeva et al., 2018); knowledge acquisition through inter-firm recruitment (Chen and Tan, 2016); knowledge transfer in joint ventures (Inkpen, 2008)- again, to name a few. These studies aimed to explain various aspects of firm knowledge transfer. Richter and Vettel (1995), for example, suggest knowledge transfer as a two-stage process i.e. internalization of external knowledge and altering the underlying values of internal knowledge

to assimilate the acquired knowledge. Similarly, Inkpen and Dinur (1998) suggest four ways of knowledge transfer i.e. through technology sharing, alliance-parent interaction, personnel transfers, and strategic integration among partner firms.

Other major relevant research themes include: knowledge ambiguity (Simonin, 1999); knowledge sharing (Connell and Voola, 2007; Ku and Fan, 2009); knowledge leakage (Qiu and Haugland, 2019; Ritala et al., 2018); knowledge creation (Huang, 2009; Wu and Lee, 2015; Lin, 2017); open innovation (Oduro, 2019; Arfi et al., 2019) and intellectual capital (London and Siva, 2011; Luo et al., 2009; Kang and Snell, 2009).

Our review finds that the majority of these studies were conducted from the perspective of organizational learning (Inkpen, 1998; Inkpen, 2000; Kidd, 1998); resource-based view (Jiang, 2011; Shenkar and Li, 1999; Veilleux and Roy, 2015) and dynamic capability perspective (Zacharia et al., 2011). One important and interesting observation is that the concept of 'absorptive capacity' has received much attention from scholars in this particular field (Shenkar and Li, 1999; Ho et al., 2019; Salk and Lyles, 2007). These studies thus primarily explain the role of absorptive capacity (a type of dynamic capability) of a firm in a knowledge acquisition process and investigate how a firm learns from its partner through this process.

Based on the above brief review, we have identified the divergence in knowledge management in the context of a strategic alliance perspective and this includes both, the theoretical frameworks and processes. Thus, a need to consolidate the existing body of research on knowledge management in a strategic alliance context becomes pivotal. The need for this is evidenced with the number of reviews (almost 23 reviews are published as per Scopus data base on 04/05/2020) on the said theme. These reviews include: - knowledge transfer and innovation growth from a dynamic capability perspective (Aggarwal and Kapoor, 2018); knowledge leakage in inter-firm relationships in new technology-based firms (Ribeiro Soriano and Parker, 2012); knowledge management in strategic alliance (Meier, 2011), tracing the KM literature in inter-organizational setup (Agostini et al., 2020) and so on. Certainly, these efforts identify the existing research scenario on the topic of KM in a strategic alliance context. That said, we find that these reviews were limited in coverage and restricted to a narrow and specific theme. In addition, the majority of these extant reviews were conducted using conventional literature review approach and failed to employ more objective and systematic literature review approaches such as bibliometric and structured network analysis (see for example Bamel et al., 2020).



These approaches are considered more objective and found to mitigate the authors inclusion-exclusion bias (Zupic and Cater 2014). A recent review (Agostini et al., 2020) was an exception, however the scope of this paper was limited to only 85 articles. The data search terms used in the Agostini et al., (2020) paper were limited to ‘knowledge manag’ or ‘manag knowledge’ in the title, and the terms ‘alliance’ or ‘network’ or ‘inter-organi relationship’ or ‘partnership’ in the topic. In contrast in this paper, we used a larger set of search terms denoting all stages of knowledge management (i.e. knowledge acquisition, knowledge creation, knowledge protection, knowledge protection, and so on) within a strategic alliance context. This search broadened the scope of data search and resulted in a rich sample of 393 documents, which is almost 5 times as compared to the Agostini et al., (2020) study. The collected data than were analyzed using quantitative methodology to understand the past, present and potential future of KM research in a strategic alliance’s context.

### **3. Methodology**

The primary objective of this study is to review the holistic, inclusive set of knowledge management research literature in a strategic alliance context, in order to achieve answers to our two key research questions above. This study employs a quantitative literature review approach that analyses the bibliometric indicators of selected publications (Bamel et al., 2020s; Bamel et al., 2020b). Bibliometric analysis is an objective way of critically reviewing the relevant literature, as it controls the author biases related to inclusion and exclusion of publications in a given field (Zupic and Cater 2014).

#### **3.1 Data retrieval**

This section details the data retrieval process for the study. Bibliometric information of relevant publications was retrieved from the Scopus data base on May 4, 2020. The advantage of using the Scopus data base is that it provides a consistent coverage of published documents (Waltman, 2016). For data retrieval, this paper followed the established data retrieval protocol for systematic literature reviews (Jones et al. 2011). The most important features of the established protocol are that these protocols are impartial and based on the principles of equal access, focus, transparency and replication of data units (Thorpe et al. 2005).

The following search string was used for data retrieval on the topic, field, article, title, keywords, and abstracts: TITLE-ABS-KEY ( "knowledge management" or "knowledge management systems" OR "knowledge based systems" OR "knowledge management strategy" OR "knowledge management activities" OR "knowledge management capabilities"

OR "knowledge creation" OR "knowledge acquisition" OR "knowledge application" OR "knowledge sharing" OR "knowledge transfer" OR "knowledge protection" OR "knowledge theft" OR "knowledge storage" OR "enterprise knowledge management" OR "knowledge dissemination" OR "knowledge evaluation") AND TITLE-ABS-KEY ("strategic alliances" OR "strategic alliance" OR "joint ventures" OR "international joint ventures" OR "IJVs" OR "international strategic alliances" OR "inter-firm partnership" OR "firm collaboration" OR "firm partnership" OR "joint venture" ). This search resulted in 556 documents.

Thereafter, to ensure the relevance of the publications, certain inclusion and exclusion criteria were used (Tranfield et al. 2003). Inclusion and exclusion criteria that were followed were: all source title irrespective of their impact factor were included; articles published in English language were included and publications in Chinese, Spanish, French, German etc. were included (resulted in 536 documents); articles, reviews, book and book chapters were included and conference papers, conference review, letter, notes, short survey, editorial were excluded (resulted in 426 documents); publications in subject area business management and accounting, social sciences, economics, psychology were included and whereas subject areas such as mathematics, chemistry, physics and astronomy, energy, immunology and microbiology, biological science, biochemistry and neuroscience were excluded (resulted in 393 documents). The final data set thus has 393 documents,

### **3.2. Data Analysis**

To analyze the collected bibliometric information (number of publications, total citations, citation per author and per publication, h index, m index) we used two open source analytical packages (Bibliometrix R package, Aria and Cuccurullo, 2017; and VOSviewer, van Eck and Waltman, 2009).

Data were analyzed utilizing a two-stage process: the first stage included conducting a descriptive analysis which helped in understanding the trends, such as identifying productive authors on this topic, influential publications, influential sources, etc. The second stage of the analysis included developing the knowledge structure and network of research on this topic. We used citation analysis, co-citation analysis and bibliographic coupling to develop a knowledge structure and its networks. In addition to Bibliometrix R package (Aria and Cuccurullo, 2017) and VOSviewer (van Eck and Waltman, 2009), free source software was also used.

## **4. Results and Discussion**

#### *4.1 RQ 1: Publication trends/general description of KM research in Strategic alliances*

This section explains the general trends and offers a description of KM research in a strategic alliance context. Our data set includes 393 documents comprising of 336 research articles, 25 reviews, 5 books, and 27 book chapters, which are published from 1988-2020. These documents are published in 210 sources (Journals, Books etc.) with an average citation of 69.66. These 393 documents are published by 707 authors. The author collaboration index is 2.19 and co-authors per documents is 2.19. Table 1 describes the data set in detail.

##### *4.1.1 Annual Publication Trends*

Figure 1 presents the annual publication trends i.e. the quantity on a yearly basis. The annual publication quantity has grown with an annual growth rate 8.48 percent. The first article on the theme dates back to 1988 and appeared in MIS Quarterly. For the next decade thereafter, we notice that the quantity of publication on this theme rises, albeit steadily. However, post 1998, the number of publications observed a spurt and every year thereafter, it remained above the trend line except for the years 2013, 2014 and 2017. The sharp increase in the number of publications indicates the increasing popularity of the theme in contemporary business environment.

##### *4.1.2 Most Productive Scholars in KM in Strategic Alliance context*

Next, we tried to understand who the important scholars are (most productive) in the field and their impact on KM research in a strategic alliance context. Table 2 presents the details of 20 most productive authors and their various citation index such as total citation, h index, G index, total publication/total citation ratio etc. These 20 authors are ranked as per their number of publications and in case of a tie in publication numbers, these authors are ranked as per their number of citations. In addition, the table also details the active involvement period of most productive authors. The ranking suggests that Tsang, EWK (6 publications, 2357 citations, 3 papers are cited more than 100 times and at least one paper has received more than 500 citations) of Naveen Jindal School of Management, UT Dallas; Lyles, MA (6 publications, 1360 citations) of Kelley School of Business; and Jiang, X (6 publications and 366 citations) of Xi'an Jiaotong University are top three ranked authors in the field. In terms of most impactful authors Inkpen, AC of Thunderbird School of Global Management has received maximum citations (3280 citations). The publication production timelines of authors depict that almost 50 percent of most productive authors are still actively and currently engaged in this research

field. Another interesting observation is that in terms of affiliation this list is primarily dominated by the United States of America.

#### *4.1.3. Most cited individual work*

Moving forward, we identified the top 20 most impactful (most cited) works in the field. It is well accepted that knowing the impact of individual work on a particular research domain is very important to understand the evolution and structure of a knowledge field. Table 3 details the 20 most influential research publications. The most impactful article (Inkpen and Tsang, 2005) discusses the role of social capital in knowledge transfer and has received 1876 citations in the selected field of study. The second ranked article suggests that equity arrangement among partners and absorptive capacity of the alliance influence knowledge transfer alliances (Mowery et al., 1996). These 20 publications mainly address the themes such as knowledge transfer, knowledge acquisition, and organization learning (table 3), within the context of strategic alliances. Table 3 also reveals that these articles are mainly published in *Strategic Management Journal* (5 publications) and *Journal of International Business Studies* (5 publications). Other journals are *Journal of Management Studies*, *Organization Science* and *Academy of Management Journal*.

Identifying the most productive authors and most impactful work is important, so as to understand the role of actively engaged scholars and the pioneering work in a particular field of study. It is however also equally important to identify the most productive journals and countries from where these publications emanated. Table 4 lists the top 20 most productive journals, countries and frequently used keywords. A close scrutiny of table 4 reveals that the journals who welcomed researches working in the cross disciplinary areas of international business, knowledge management and strategic management are ranked as the most productive journals in the field. For example: *Journal of International Business Studies* is ranked one followed by the *Strategic Management Journal*. Other important titles are *Journal of Business Research*, *Journal of Knowledge Management*, *Journal of World Business* and so on. In terms of the most productive countries, the United States of America is followed by United Kingdom, Taiwan and China. It is interesting to note that the most productive country list includes a few developing countries. This may be attributed to the theme of the research i.e. strategic alliances. Strategic alliances are considered as a popular strategic tool and governance structure whilst entering into a foreign market. In terms of frequently used keywords, strategic alliance is

followed by knowledge management, knowledge transfer, joint ventures, knowledge acquisition, innovation, absorptive capacity and knowledge sharing.

#### ***4.2 RQ 2a: Conceptual structure***

A conceptual structure of a research field helps in understanding the organization of underlying features and explanations of a concept and its various functions (Ross, 2001). The organization of underlying features of a concept helps in understanding important and recent themes/issues in a research (Aria and Cuccurullo, 2017). To develop the conceptual structure of the KM research in a strategic alliance context, we used co-word analysis of key words to construct the Strategic diagram and Sankey diagram of the research field using bibliometric package in r software (Aria and Cuccurullo, 2017; Zupic and Čater, 2015; Bamel et al., 2020).

##### *4.2.1 Strategic Diagram of KM research field in strategic alliance context*

A Strategic diagram is a two-dimensional map that structures/classifies the research themes into four key groups (i.e. motor themes, basic themes, emerging or disappearing themes, and specialized/niche themes) in a research field using density and centrality rank values (Cobo et al., 2011). Figure 2 shows the strategic diagram of KM research within a strategic alliance context and presents four major themes i.e. one basic theme (right lower quadrant), one motor theme (right upper quadrant), one emerging theme (left lower quadrant) and one peripheral theme (left upper quadrant). The size of circles in the map depicts the size of the research themes in the field.

##### *4.2.2.1 Motor theme*

The motor theme (right upper quadrant) has a high centrality and high density and is named as knowledge transfer in strategic alliances. This theme constitutes and includes keywords such as knowledge transfer, joint ventures, social capital, entry mode, reverse knowledge transfer, developing countries etc. The motor quadrant indicates that the knowledge transfer theme is well developed and important for the KM research within a strategic alliances context. The majority of the articles in in this theme revolves around the concept of knowledge transfer and explores the issues such as determinants of knowledge transfer (i.e. ambiguity, alliance governance structure governance mechanism, culture fit etc.), innovation performance, reverse knowledge transfer, entrepreneurial orientation etc. Recently, a shift is observed in this cluster from governance structure to reverse engineering, the evolving and increasing role of social

capital and culture in knowledge transfer, and organizational unlearning (Simonin, 1999; Shekhar et al., 2015).

#### 4.2.2.2 Basic theme

The basic theme (right lower quadrant) has a high density and low centrality and is named as knowledge creation and knowledge sharing in alliances. This theme constitutes and includes keywords such as strategic alliance, inter-firm collaboration, knowledge management, knowledge sharing, innovation, and so on. Articles published under this theme covered topics such as outcomes of knowledge sharing (i.e. customer focus, innovation performance, customer relationship management, alliance performance), knowledge creation through alliances and inter-firm collaborations.

#### 4.2.2.3 Peripheral theme

The peripheral theme (upper left quadrant) has a low density and high centrality and is named as innovation and product development in strategic alliances. This theme constitutes and includes keywords such as new product development, open innovation, resource-based view, patents, technology transfer, governance, research and development etc. The size of the circle denotes that this theme has received comparatively less attention. Research publications on this theme includes the topics such as significance of knowledge sharing in open innovation, effects of knowledge depth, scope and tie strength on new product development- to name a few. Our analysis reveals that the resource-based view is referred to in the majority of publications under this theme. Technology transfer is another most researched challenge under this theme.

#### 4.2.2.4 Emerging theme

The emerging theme (lower left quadrant) has a medium centrality and density and is named as knowledge acquisition and assimilation in strategic alliances, international joint ventures, performance, trust, knowledge creation and so on. In terms of the size of this theme, it appears that this theme has only recently started receiving attention from the scholars globally.

#### *4.2.2 Sankey Diagram of KM research field in strategic alliance context*

This study used the Sankey diagram to understand the thematic evolution of the KM research field within a strategic alliance context, over a period of time. Sankey diagrams visualizes the movement of values from one node to another node through links/paths and helps in

understanding the development of a field, its direction and prediction of future trends (Aria, Misuraca & Spano, 2020). The nodes in figure 3 represents the research topic/theme and size of the nodes represents the quantity of the research in respective topic and the paths between the nodes depicts the evolution of topics/themes and evolutionary relationships among them, over time (Cobo et al., 2011). To construct a Sankey diagram, we considered 500 keywords used by authors, using inclusion index weighted by word occurrences. The period of publication 1988 to 2020 was divided into three time/eras (1988-2007; 2008-2014; 2015-2020), and this was based on the representative size of research, in order to develop a meaningful map.

Figure 3 depicts that during time/era one (1988-2007) the main research topics/themes were knowledge management, organizational learning, knowledge transfer, International joint venture and tacit knowledge (in decreasing order of their size). Out of these five topics knowledge management and international joint venture appeared as a basic/foundation theme during 1988-2007. Knowledge transfer, appeared as the motor theme and tacit knowledge and organizational learning appeared as peripheral themes. This suggests that during the 1988-2007 period, the themes knowledge management, knowledge transfer and international joint venture, received maximum attention within our given research field. Organizational learning and tacit knowledge also attracted scholarly attention, but not sufficiently. Absorptive capacity appeared as a basic theme and this indicates that during this time/era, dynamic capability perspective was widely used as a theoretical framework within the KM research field. Other issues addressed under this topic were new product development, knowledge acquisition and trust. Very interestingly, knowledge transfer, which was otherwise a motor theme in time/era one, shifted to an emerging theme in time/era two. Knowledge sharing was another major topic during time/era two, which however was a peripheral theme. Figure 3 depicts a shift in research focus from time/era one to time/era two, as interest in topics such as tacit knowledge and organizational learning diminished and topics such as knowledge sharing and absorptive capacity emerged.

During time/era two (2008-2014), strategic alliance, knowledge transfer, absorptive capacity and knowledge sharing appear as a major research topic within the KM research field in a strategic alliance context. Strategic alliance appeared as the motor theme and it included topics such as knowledge management, knowledge creation, organizational learning, innovation etc. During time/era three (2015-2020), topics such as strategic alliance, knowledge management, knowledge creation, absorptive capacity, China, international joint ventures, knowledge transfer etc., emerged as key research theme/topics. Absorptive capacity and knowledge

management remained basic themes in time/era three, whereas knowledge transfer again moved its position and shifted to a peripheral theme. Surprisingly, no research topic appeared as motor and emergent topics. This portrays that research in time/era three is yet to mature and is still evolving.

The paths between three time/eras (figure 3) shows how KM research within a strategic alliance context has evolved during and over a period. The path flow reveals how a particular research topic appeared and contributes to the emergence of another topic. For example, tacit knowledge appeared as an important topic of research during time/era one. which however disappeared during time/eras two and three. Similarly, knowledge transfer which was a motor theme during time/era one became an emerging theme in time/era two and this led to the rise of a new research topic i.e. knowledge sharing in time/era two. These paths also predict the possible future extension of this research field. For example, knowledge creation currently appears as an emerging theme within this research field. Another important revelation is the use of the theoretical paradigm in this research field. It appears that dynamic capability is referred to overwhelmingly when it comes to examining the issue of KM within a strategic alliance context.

Conclusively, figure 3 demonstrates that the KM research field within a strategic alliance context is still evolving and it has observed a range of convergence and divergence of research topics during last three decades.

#### ***4.3 RQ 2b: Intellectual structure of KM in Strategic Alliances***

Next, to address our research question about the intellectual structure of the research field, this study employed a citation analysis to constitute the intellectual structure of the KM research within a strategic alliance context (Aria and Cuccurullo, 2017). Intellectual structure is an “organized map of salient features of a knowledge base and it reveals the disciplinary composition and tradition of research in a knowledge domain” (Shafique, 2013, p 2). More specifically, we used co-citation analysis and bibliographic coupling to structure the field of study, intellectually.

##### *4.3.1 Co-citation analysis of secondary documents*

Co-citation analysis usually presents the historical evolution of a research domain. Co-citation of two documents means they are cited together in a third document (Small, 1973). We constituted co-citation network of secondary documents/cited references. Secondary



documents are the documents which are not retrieved through primary search, but are however cited in the primary search documents (Vogel, 2012). The co-citation pattern among cited documents helps in understanding the roots and traditions of a research field (Vogel, 2012). Out of a total of 21078 secondary documents, 234 documents met the criterion of a minimum of 5 citations. For each of the 234 cited references, the total strength of the co-citation links with other cited references is calculated and the top 100 cited references with greatest total link strength are considered for constructing co-citation network. This yielded a network of four clusters (figure 4) of 2685 links and total link strength of 682.53.

Cluster one is the largest cluster (red color nodes) with 37 items and is positioned at the lower left side of the network (figure 4). This cluster includes articles by Lyles and Salk (1996); Simonin (1999); 2004); Dhanaraj et al., (2004). Publications in this cluster, mainly examines the issue of knowledge transfer in strategic alliances from a dynamic capability view, and more specifically from an absorptive capacity perspective (Muthusamy and White, 2005; Dhanaraj et al., 2004). Most of the publications here were clustered around after the year 2000. We named this as knowledge transfer in strategic alliances. Cluster two is the second largest cluster in co-citation network and constitutes of 30 documents. This cluster includes articles by Cohen and Levinthal (1990); Grant (1996) and Inkpen and Dinur (1998). Articles in this cluster are primarily based on the knowledge-based view of the firm (Nonaka, 1994; Grant, 1996; Grant and Baden-fuller, 2004; Inkepen, 1996) and absorptive capacity (Cohen and Levinthal, 1990; Lane et al. 2001). The timeline for these publications is between 1991 to 2004. This cluster provided the foundation of absorptive capacity-based research i.e. knowledge assimilation and knowledge acquisition. We named cluster two as knowledge and absorptive capacity in strategic alliances.

Cluster three constitutes 24 documents and is positioned on the upper left side of the network and close to cluster one. This cluster includes articles by Kogut (1988); Kogut and Zander (1992); and Dyer and Singh (1988). These papers addressed the role of knowledge in building capital and capabilities of strategic alliances for example, innovation (Powell et al., 1996); firm capabilities (Kogut and Zander, 1992) etc. A close review of these articles reveals that majority of these articles are published between 1988 and 1998 and refers mainly to the organizational learning and capability perspectives. We named this cluster as knowledge and strategic alliance performance. Cluster four is the smallest in the network and constitutes 9 documents that are central to the network, as it is positioned in the center of the network and in the proximity of all the clusters. This cluster includes articles by Hamel (1991) and March (1991). Documents

clustered here are published between 1984 and 1991, with the exception of Grant and Baden-Fuller (2004). We named this cluster as learning in/through strategic alliances, as all documents gathered in this cluster primarily addresses the issue of organizational learning in a strategic alliance context (Hamel, 1991). It is worthy to note that papers in this cluster primarily refer to the resource-based view (Barney, 1991). Considering these findings, it is pertinent to deduce that organizational learning and the resource-based view, provided a foundation to KM research in strategic alliances.

#### *4.4.2 Bibliographic coupling of primary documents*

Next, to understand the potential future extension of the KM research within a strategic alliance context, we constructed a bibliographic coupling network of the top 100 primary documents with greatest link strength. Initially, we incorporated a criterion of a minimum of 10 citations out of 393 primary documents, wherein 206 documents meet this criterion. Next, out of the 206 documents, we selected the top 100 documents, on the basis of their link strength to construct network. As bibliographic coupling is future oriented, it considers primary documents for identifying the emergent topics and future directions of a field (Vogel, 2012). Two documents are called bibliographically coupled if they both cite a common document and hence bibliographically coupled documents would have a high degree of similarity among their references (Van Eck and Waltman, 2014). Here, our analysis yielded a network of 3 such clusters.

Cluster one constitutes 39 documents and is positioned towards the right side of the network. This cluster includes the article by Scaringella (2017), which has the highest link strength (i.e. 876), among the 39 documents. This paper highlights the role of absorptive capacity in knowledge transfer and acquisition for radical innovation and suggests that barriers to technology transfer and poor absorptive capacity negates knowledge transfer and acquisition. The article by Squire (2009) is next with a link strength of 851. This paper examined the role of relational factor in a horizontal alliance (buyer-supplier relationships) mechanism and concludes that co-operation, trust, relationship duration and performance of horizontal partner influence the knowledge transfer among such alliances. This paper also extends the concept of alliances to horizontal co-operative arrangements and this could possibly be a potential extension of the present research field, that investigates how a firm can renew its knowledge without equity and ownership commitment. Another paper (Subramanian, 2018), talks about the role of knowledge characteristics i.e. knowledge base homogeneity and technological

distance between partners in promoting innovation outcomes of an alliance. The majority of the articles in this cluster appeared between 2010 and 2018 and address research themes such as tie strength and product development, KM and innovation performance in alliances (Jiang and Li, 2009), knowledge acquisition and new product innovation (Dunlap et al., 2016). Thus, documents in this cluster primarily explore the role of knowledge and learning in new product development and innovation performance and this could be one of the key future extensions of the KM research within a strategic alliance context. This cluster therefore focuses more on outcomes of KM within a strategic alliance context.

Cluster two constitutes 33 documents and is situated at the lower left side of the network. This cluster includes articles by Meier (2011) and Khan (2015), with link strengths of 1288 and 1036 respectively. Meier (2011) reviews and consolidates the state of KM literature within a strategic alliance context. The main focus of articles in this cluster revolves around the concept of knowledge transfer within a strategic alliance context (Park et al., 2012; Park et al., 2015; Khan et al., 2015). Key aspects of knowledge transfer that are explored in this cluster include multilevel i.e. collective and individual level knowledge transfer (Khan et al., 2015); the role of IJVs age, when it comes to the transfer of tacit and explicit knowledge (Park et al., 2015); the role of exchange climate dimensions, such as conflict resolution and cooperation, which is positively linked with tacit knowledge transfer; a multi stage model of KM in IJVs i.e. knowledge transfer to new entity, knowledge adaption by new entity and reverse knowledge transfer to partner firms; the influence of disseminative capacity ( a type of dynamic capability) on knowledge transfer (Park et al., 2018). Conclusively, this cluster revolves around the central theme of knowledge transfer, albeit with new micro phenomena such as disseminative capacity, multistage model of knowledge transfer etc.

Cluster three constitutes 28 items and is positioned on the upper left side of the network (figure 5). Cluster three includes articles by Reid (2001); Mazloomi (2008) and Inkpen (2000), each having link strengths if more than 1000 each. This cluster mainly addresses the issues of learning in strategic alliances (Inkpen, 1998; 2000; Muthusamy, 2005). Few such themes include formal and informal learning, within inter-firm arrangements; knowledge embeddedness, knowledge search and knowledge ambiguity etc., to name a few. The publication time line in this cluster is between 2000-2010. Conclusively, this cluster revolves around the issue of learning in strategic alliances.

On the basis of a bibliographic coupling network, we thus deduce that organizational learning has been an important theme in KM research in strategic alliances, however the focus of KM research is shifting towards more specific areas such as knowledge transfer and relationship of knowledge transfer with performance outcomes. For example: external embeddedness and research and development capacity of foreign subsidiaries (Rodrigues et al., 2020); knowledge flow and innovation system evolution (Zhao et al., 2019).

## **5. Implications and future research**

This paper reviews almost 30 years (1988 to 2020) of KM research within a strategic alliance context, by using a quantitative and structural approach i.e. bibliometric and social network approach. Our contribution is an early effort that analyzes almost 400 primary research documents and 20586 secondary documents to offer a reflection on the historical progression of this field of research, its current state and impact and it also tries to predict the potential future extension or where it is heading. More specifically, this paper identifies the general research trends i.e. annual publication rate, most productive authors and their impact, most impactful individual work, and most productive sources and countries and their impact, and most frequently appeared keywords in KM research within a strategic alliance context. This paper further unfolds the conceptual and intellectual structure of knowledge management research within a strategic alliance context, and systematically tries to predict the direction where it is headed. By doing so, this paper offers potential areas for future research.

Through this paper we also contribute by an understanding in terms of the annual publication trends, most frequent key words, most productive and impactful author, source and country. This provides a quick description of the research field and helps in understating the general discourse of a research field. Our analysis suggests that publications on KM in strategic alliances is growing at a rate of 8.48 percent annually. This finding reveals the increasing impact of the KM research in strategic alliance context, both quantitatively and qualitatively. Our analysis also identifies Inkpen, A.C. to be the most impactful scholar in the field and Tsang, EWK, Lyles, MA and Jiang, X were found to be the most productive authors in the field. Identifying who's who as pioneers in a research field also helps a research audience in understanding their role and contribution. Similarly, knowing the most impactful individual research enables a research audience in identifying important research topics and themes. For example, social networks, absorptive capacity, learning, knowledge transfer etc., are the most studied themes in this particular research field. A list of the most productive publications

sources suggests that the platforms to access and disseminate relevant research and scholars working in the field is beneficial. Another interesting and important trend we find here is that scholars from both developing and developed economies were contributing to this research field almost equally. This fact reveals the relevance and importance of this particular research field for these economies and perhaps this is perhaps very rare that such a research field has received attention from both developed and developing economies.

This paper also examined the conceptual structure of KM research within a strategic alliance context. To achieve this, we employed co-word analysis and constructed the Strategic map and Sankey diagram. As described and discussed above, the strategic map (figure 2) revealed four important themes i.e. knowledge creation and sharing (basic theme), knowledge transfer (motor theme), product development and open innovations (peripheral/specialized theme) and knowledge acquisition and assimilation (emerging theme). This finding consolidates the holistic knowledge base of a research field and reveals the central and key topics, as well as topics that were underdeveloped and emerging or evolving. This of course, has implications for future extension of the field of KM research within a strategic alliance context. For example, our findings suggest that more emphasis needs to be given to the areas or topics of knowledge acquisition and assimilation, product development and open innovation. We argue that knowledge assimilation ability might be understood as one form of absorptive capacity and it significantly predicts knowledge-based outcomes or performance of an alliance. Our findings further suggest that knowledge creation and knowledge transfer are the central themes, however renewal of research or diversification of research in terms of micro topics within these two themes is noted such as organizational unlearning, level of knowledge, reverse knowledge flow etc. thus, these findings suggests the possible topics for future research inquires.

We further contribute through this paper by presenting the thematic evolution of this research field over a period of time (1988-2020). The period of publications 1988 to 2020 was divided into three time/era's (i.e.1988-2007; 2008-2014; 2015-2020), on the basis of representative size of research, in order to develop a meaningful map. The Sankey diagram (figure 3) depicts that how various research topics evolved over time and contributed in the emergence of the other evolving topics. Knowledge management, organizational learning, knowledge transfer, international joint venture and tacit knowledge were the main themes of this research field during time/era one (1988-2007). During this time/era, studies focused on exploring the relevance of information and knowledge in inter-organizational configurations (Levinson, 1994; Inkpen and Dinur, 1998). This time/era also observed the influence of organizational

learning in establishing KM research within a strategic alliance context (Richter and Vettel, 1995; Inkpen, 1998; Berdrow and Beamish, 2003).

Around and post the millennium year 2000, the main focus of research in this time/era was on knowledge transfer (Simonin, 1998; Simonin, 2004; Walter et al., 2007). However, these articles did not address the key area of performance outcomes of knowledge transfer and were limited only to issues such as challenges of knowledge transfer (Kingenberg and Rothberg, 2007); social capital perspective of knowledge transfer etc., (Walter et al., 2007). We can however deduce that these articles have established the relevance and significance of KM within a strategic alliances context and thus provided a foundation to time/era two (2008-2014). Though knowledge transfers also remained an important theme of investigation during this particular time/era two, however, the nature of inquiries during this period shifted to identifying the determinants and antecedents of knowledge transfer such as culture, climate, governance structure, entrepreneurial orientation (Mazloomi and Dominique, 2008; Oxley and Wada, 2009; Idris and Tey, 2012; Park et al., 2012). A notable finding is that knowledge sharing appeared as an offshoot of knowledge transfer as research moved from time/era one to time/era two.

Knowledge sharing was an important theme during time/era two and contributed in establishing the KM field within a strategic alliances context (Connell and Voola, 2007; Ku 2009). It is pertinent to mention that towards the tail end of time/era two, studies started examining the relationship between knowledge transfer, knowledge sharing and performance outcomes (Connell et al., 2014; Ritala et al, 2015). Absorptive capacity was another topic of research rife during time/era two and this further continued over to time/era three. During time/era three (2015-2020), few new and key themes emerges such as knowledge creation (Partk et al., 2015). Conclusively, KM research within a strategic alliance context can be claimed to be established sufficiently, however it could also be argued that there is continuous evolution. During time/era one, this field witnessed research involved that was more generic in nature, however this time/era also witnessed a move towards more specific and micro themes.

Based on this analysis, future research topics could include areas or topics that aid in the understanding of the KM processes as they involve more complex governance structures, wherein a firm has multiple alliances/partnerships (see examples of the global information technology (IT) sector by Malik, Pereira and Budhwar, (2020, in press), where they introduce a term '*multivergence*', as it portrays multiple alliances/partnerships). Examining KM process

in a multiple constituencies' context become very important (Agostini et al., 2020). We thus argue that since KM is a multistep process, exploring specific contextual conditions for various stages/steps of KM within a strategic alliances context, becomes important. Also, research on the relationship between KM and desired outcome is in nascent stages, and needs to be explored further.

This paper further contributes by constructing the intellectual structure of KM research within a strategic alliances context, to understand the roots and traditions of it as a research field (Vogel, 2012). To this effect, this study employed co-citation analysis of secondary (figure 4) and bibliographic coupling (figure 5) of primary documents. Our co-citation analysis revealed a few interesting facts about the roots and traditions within the KM research field. In other words, this co-citation network helped us in identifying the contribution of various theories and concepts in KM research field. For example, historically this research field was based in the concept of organizational learning and the resource-based view of the firm, which provided the theoretical legitimacy of the KM research during early years. Second, absorptive capacity which is a type of dynamic capability is referred overwhelmingly in knowledge acquisition, knowledge-transfer and knowledge-assimilation topics.

Interestingly, these findings correspond with the conceptual structure findings. Having identified the past, and to understand the present status and potential future extension, we constructed bibliographic coupling network of primary documents. Our findings here suggest that the relationship between KM and desired performance outcome is attracting scholars and we expect a surge involving and taking on this line of inquiry. We also recommend research on phenomena's such as knowledge transfer and open innovations, knowledge sharing and alliance performance etc. We further argue that various issues related to knowledge transfer requires further examination, as also topics such as organizational unlearning, reverse knowledge flow and disseminative capacity, upper echelons research and KM (Kiessling et al., 2020); role of IT intensity on knowledge transfer (Ravichandran & Giura, 2019); Knowledge leakage in collaborative endeavors (Fawad Sharif et al., 2020); reflective knowledge exchange (Papa et al., 2020) require more attention.

## **6. Conclusion and limitations**

This paper aimed at offering the description and general trends of KM research within a strategic alliance context. In addition, to understand the roots, historical progression and present status and possible future extension, the conceptual and intellectual structure of the

research field was further constructed. The data for the paper was retrieved from Scopus and the bibliometric characteristics of 393 primary documents was analyzed using Bibliometrix and VoSviewer package. The bibliometric and structured network analysis approaches employed in this paper offers the general description of research field in terms of most productive and impactful authors, annual publications trends, most impactful research work (primary and secondary both) etc. This analysis also offers the conceptual structure of the research field which reveals the historical progression of the research field and offers an understanding about central and emerging themes or topics. The intellectual structure of the research field presents the roots of the research field and also describes the present and potential future of KM research in strategic alliance context meaningfully.

Conclusively, this paper provides a comprehensive review of existing KM scholarship within a strategic alliance context and provides a synergy in relation to reviews of similar nature. However, like all research paper this paper also has some of inherited limitations. For example, data set for the present paper was retrieved using a list of keywords and there might be a possibility of exclusion of some of the work which does fall in the purview of the current theme. Although, we have taken all possible steps to include and retrieve relevant publications the possibility of some exclusions cannot be negated. Second, no doubt this paper is a first of its kind which consolidates the KM research field in conceptual and intellectual structure using sophisticated analytical programs, there is a scope of doing more analysis such as author-based coupling etc., future work might consider a possible extension and further development of our present paper.



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**Table 1. Main Information about the data set**

<b>DESCRIPTION</b>	<b>Results</b>
Publication Timespan	1988:2020
Sources (Journals, Books, etc)	210
Documents	393
Average years from publication	10
Average citations per documents	69.66
Average citations per year per doc	4.81
References	20586
<b>DOCUMENT TYPES</b>	
Article	336
Book	5
Book chapter	27
Review	25
<b>DOCUMENT CONTENTS</b>	
Keywords Plus (ID)	856
Author's Keywords (DE)	850
<b>AUTHORS</b>	
Authors	707
Author Appearances	862
Authors of single-authored documents	95
Authors of multi-authored documents	612
<b>AUTHORS COLLABORATION</b>	
Single-authored documents	113
Documents per Author	0.556
Authors per Document	1.8
Co-Authors per Documents	2.19
Collaboration Index	2.19

Source: Scopus data base accessed on 05/05/2020



**Table 2. Most productive authors and their citation structure**

R	Author	Affiliation	Research themes	NP	PY Start	TC	H index	G index	M index	Citation Structure			
										≥500	≥100	≥50	≥10
1	TSANG EWK	The Naveen Jindal School of Management, Richardson, United States	Knowledge acquisition and transfer in IJVs	6	2002-2017	2357	5	6	0.26	1	2	1	2
2	LYLES MA	Kelley School of Business, Bloomington, United States	Knowledge acquisition, managing knowledge during inter-partner transfer in IJVs	6	1996-2007	1360	5	6	0.2	2	1	1	1
3	JIANG X	Xi'an Jiaotong University, Xi'an, China	Knowledge management, knowledge flow and innovation in strategic alliances	6	2009-2016	366	5	6	0.42	0	1	2	2
4	INKPEN AC	Thunderbird School of Global Management, Glendale, United States	Social capital, Knowledge acquisition and learning in IJVs,	5	1998-2008	3280	5	5	0.21	2	2	1	0
5	PARK BI	Hankuk University of Foreign Studies, Seoul, South Korea	Knowledge acquisition and transfer in IJVs	5	2009-2011	162	5	5	0.41	0	0	2	3
6	VERTINSK Y I	Sauder School of Business, Vancouver, Canada	Knowledge acquisition, transfer, reverse knowledge flow and IJVs performance	5	2012-2018	90	4	5	0.44	0	0	0	4
7	Dhanaraj, Charles	Fox School of Business, Temple University, Philadelphia, United States	Managing knowledge transfer in IJVs, evolving value of IJVs in transition economy	4	2004-2008	691	4	4	0.23	1	1	0	2
8	Tihanyi, Laszlo	Texas A M University, United States	Managing knowledge transfer in IJVs, evolving value of IJVs in transition economy	4	2004-2008	681	3	4	0.17	1	1	0	1
9	Li, Jiatao	The Hong Kong University of Science and Technology, Hong Kong	Knowledge search, governance structure and competencies protection	4	1999-2016	215	4	na	na	0	1	0	2
10	Michailova, Snejina	University of Auckland Business School, Auckland, New Zealand	Knowledge leakage, knowledge protection in IJVs	4	2011-2018	202	4	4	0.4	0	1	0	1
11	Whitlock, Jeryl M.	University of Bradford, Bradford, United Kingdom	Market orientation and market knowledge transfer among networks	4	2007-2011	132	4	4	0.28	0	0	1	2

12	Park, Chansoo	Memorial University of Newfoundland, St John's, Canada	Knowledge acquisition from foreign partners in IJVs	4	2012- 2018	90	4	4	0.44	0	0	0	4
13	Khan, Zaheer	University of Kent, Canterbury, United Kingdom	Knowledge transfer among IJVs	4	2014- 2015	75	4	4	0.57	0	0	0	3
14	Revilla, Elena	IE Business School, Madrid, Spain	Knowledge management and learning taxonomy in IJVs	4	2005- 2006	29	2	4	0.12	0	0	0	1
15	Simonin, Bernard L.	Tufts University, Medford, United States	Knowledge transfer in strategic alliances	3	1999- 2004	1859	3	3	0.13	1	2	0	0
16	Baden- Fuller, Charles W.F.	City University of London, Cass Business School, London, United Kingdom	Technological collaboration and patenting, technological knowledge sharing in strategic alliances	3	2004- 2006	1066	3	na	na	1	1	0	1
17	Steensma, H. Kevin	University of Washington, Seattle, Seattle, United States	Knowledge sharing in IJVs	3	2004- 2008	681	3	3	0.17	1	1	0	1
18	Santoro, Michael D.	Lehigh University, Bethlehem, United States	Knowledge transfer among university-industry alliances, exploration and exploitation perspective	3	2006- 2015	333	2	3	0.13	0	2	0	0
19	Husted, Kenneth	University of Auckland, Auckland, New Zealand	Knowledge sharing and knowledge leakage and radical innovation	3	2013- 2018	196	3	3	0.37	0	1	0	1
20	Olander, Heidi	Lappeenranta Teknillinen Yliopisto, Lappeenranta, Finland	Knowledge leakage and knowledge protection in strategic alliances	3	2013- 2018	196	3	3	0.37	0	1	0	1

R= Rank; NP: Total publication in JIC; TC: Total citations; C/P: Citation per publication; h: h- index;  $\geq 100$ ,  $\geq 50$ ,  $\geq 20$ ,  $\geq 10$ ,  $\geq 5$ ,: Number of articles with at least 100, 50, 20, 10, and 5 citations respectively.

Table 3: Most impactful individual research in KM in Strategic alliance context

R	Title	Author & Year	Journal	DOI	Summary	T C	TC/Year
1	Social capital networks, and knowledge transfer	Inkpen, A. C., & Tsang, E. W. (2005)	Academy of Management Review	10.5465/AMR.2005.15281445	examines the role of social capital on knowledge transfer among intercorporate networks, strategic alliances, and industrial districts	1876	117.25
2	Strategic alliances and interfirm knowledge transfer	Mowery, D. C., Oxley, J. E., & Silverman, B. S. (1996).	Strategic Management Journal	10.1002/smj.4250171108	equity arrangement and absorptive capacity influence the extent to which partner firms' technological resources 'overlap' as a result of alliance participation.	1812	72.48
3	Ambiguity and the process of knowledge transfer in strategic alliances	Simonin, B. L. (1999).	Strategic Management Journal	10.1002/(SICI)1097-0266(199907)20:7<595::AID-SMJ47>3.0.CO;2-5	knowledge ambiguity and its antecedents - tacitness, asset specificity, prior experience, complexity, partner protectiveness, cultural distance, and organizational distance influences technological knowledge transfer among strategic alliances.	1154	52.45
4	A Knowledge Accessing Theory of Strategic Alliances	Grant, R. M., & Baden-Fuller, C. (2004).	Journal of Management Studies	10.1111/j.1467-6486.2004.00421.x	This study proposed knowledge accessed theory of strategic alliances using exploration and exploitation perspective.	927	54.52
5	Knowledge acquisition from foreign parents in international joint ventures: An empirical examination in the Hungarian context	Lyles, M. A., & Salk, J. E. (1996)	Journal of International Business Studies	10.1057/palgrave.jibs.8490155	this paper we examine organizational characteristics, structural mechanisms and contextual factors that influence knowledge acquisition from the foreign parent in international joint ventures (IJVs).	648	25.92
6	Exploration and exploitation within and across organizations	Lavie, D., Stettner, U., & Tushman, M. L. (2010).	The Academy of Management Annals	10.1080/19416521003691287	Review the relevant literature in the domain from exploration and exploitation perspective.	605	55

7	Knowledge Management Processes and International Joint Ventures	Inkpen, A. C. (1998).	Academy of Management Perspectives	10.1287/orsc.9.4.454	the study suggests four key processes - technology sharing, alliance-parent interaction, personnel transfers, and strategic integration - that share a conceptual underpinning and represent a knowledge connection between parent and alliance.	556	24.1739
8	Managing tacit and explicit knowledge transfer in IJVs: The role of relational embeddedness and the impact on performance	Dhanaraj, C., Lyles, M., Steensma, K., & Tihanyi, L. (2004).	Journal of International Business Studies	10.1057/palgrave.jibs.8400098	Examines the role of related embeddedness on knowledge transfer from organizational learning and economic sociology perspective.	515	30.2941
9	The scope and governance of international R&D alliances	Oxley, J. E., & Sampson, R. C. (2004)	Strategic Management Journal	10.1002/smj.391	This study examines the role of scope of alliance activity in controlling knowledge flow to avoid unintended leakage of knowledge.	496	29.1765
10	Commercial knowledge transfers from universities to firms: Improving the effectiveness of university-industry collaboration	Siegel, D. S., Waldman, D. A., Atwater, L. E., & Link, A. N. (2003)	The Journal of High Technology Management Research	10.1016/S1047-8310(03)00007-5	Identified numerous barriers to effective UITT such as culture clashes, bureaucratic inflexibility, poorly designed reward systems, and ineffective management of university technology transfer offices (TTOs).	395	21.9444
11	Learning through joint ventures: A framework of knowledge acquisition	Inkpen, A. C. (2000).	Journal of management Studies	10.1111/1467-6486.00215	this study proposed and developed IJV specific learning concet: alliance knowledge accessibility and knowledge acquisition effectiveness.	376	17.9048
12	Learning and knowledge acquisition through international strategic alliances	Inkpen, A. C. (1998).	Academy of Management Perspectives	10.5465/ame.1998.1333953	this paper propoes that organizational learning is a function of both knowledge access and capabilities using alliance knowledge accessibility and knowledge acquisition effectiveness.	373	16.2174
13	Transfer of marketing know-how in international strategic alliances: An empirical investigation of the role and antecedents of knowledge ambiguity	Simonin, B. L. (1999)	Journal of International Business Studies	10.1057/palgrave.jibs.8490079	this research examines the role of knowledge ambiguity pertaining to the process of knowledge transfer in international strategic alliances	358	16.2727
14	Embedded firms, embedded knowledge: Problems of collaboration and knowledge	Lam, A. (1997).	Organization Studies	10.1177/017084069701800604	This study highlights the importance of knowledge structures and work systems in influencing the success of collaborative ventures.	350	14.5833

	transfer in global cooperative ventures						
15	An empirical investigation of the process of knowledge transfer in international strategic alliances	Simonin, B. L. (2004).	Journal of International Business Studies	10.1057/palgrave.jibs.8400091	learning intent (as a driver) and knowledge ambiguity (as an impediment) emerge as the most significant determinants of knowledge transfer in alliances.	347	20.4118
16	Do bridging ties complement strong ties? An empirical examination of alliance ambidexterity	Tiwana, A. (2008).	Strategic Management Journal	10.1002/smj.666	This study examines the underexplored tensions and complementarities between bridging ties and strong ties in innovation-seeking alliances and found that	321	24.6923
17	Acquiring knowledge by foreign partners from international joint ventures in a transition economy: Learning-by-doing and learning myopia	Tsang, E. W. (2002).	Strategic Management Journal	10.1002/smj.251	This study reveals that the international joint venturing experience of a firm improves its knowledge acquisition skills	317	16.6842
18	Local knowledge transfer and performance: Implications for alliance formation in Asia	Makino, S., & Delios, A. (1996).	Journal of International Business Studies	10.1057/palgrave.jibs.8490156	this paper proposes three channels namely local firms, JV experience in host country and foreign partner's host country experience for overcoming the location based disadvantages	286	11.44
19	Learning and knowledge transfer in strategic alliances: A social exchange view	Muthusamy, S. K., & White, M. A. (2005).	Organization Studies	10.1177/0170840605050874	Refers to the social exchange perspective to understand learning and knowledge transfer in a strategic alliance.	273	17.0625
20	Remembrance of things past? The dynamics of organizational forgetting	Holan, P. M. D., & Phillips, N. (2004).	Management Science	10.1287/mnsc.1040.0273	the concept of organizational forgetting is studied in international strategic alliance.	256	15.0588

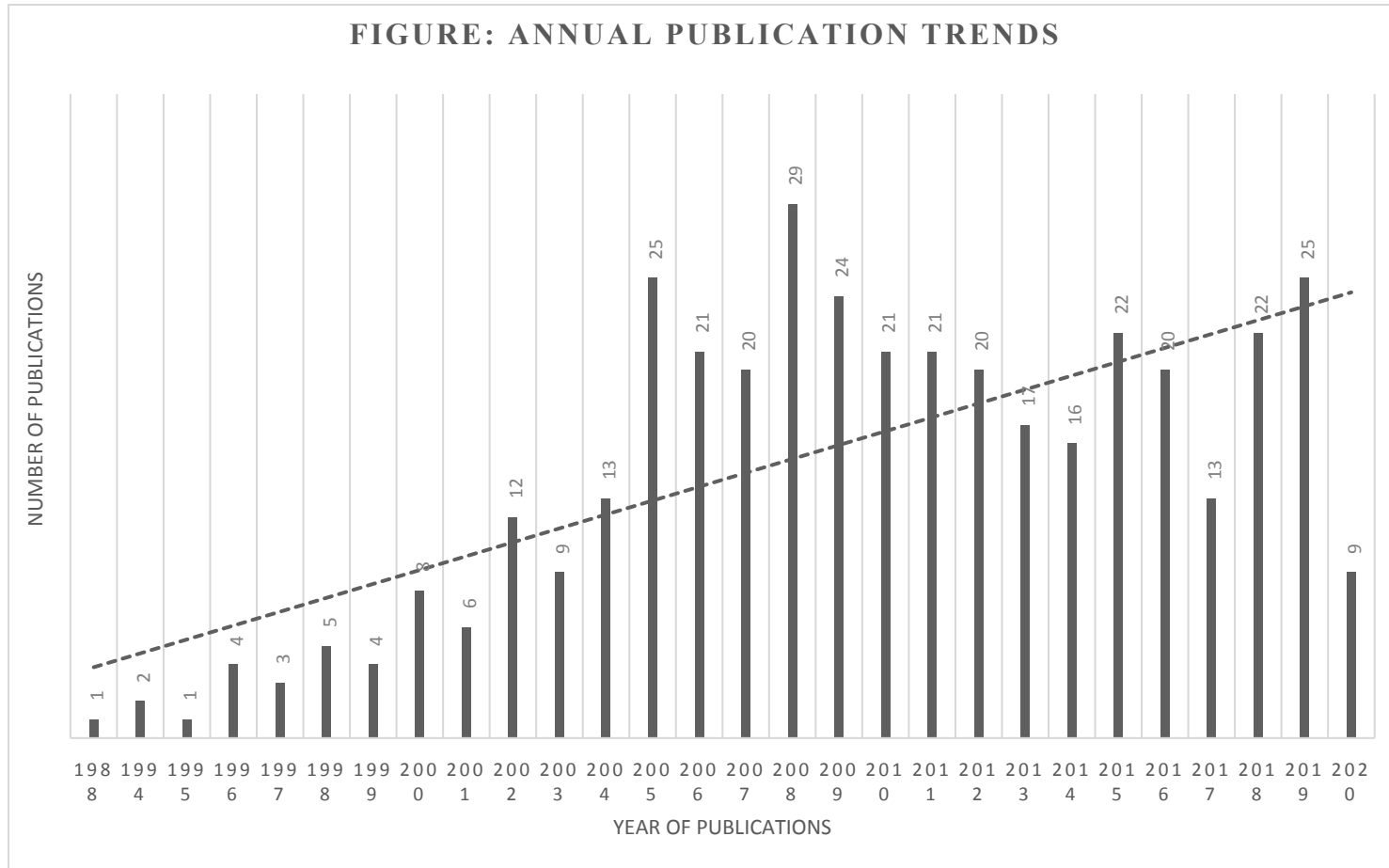
Source: Scopus database; R: Rank; TC: Total citation;

**Table 4. Most Productive Sources, Countries and Keywords (frequency)**

R	Journals	TP	TC	Country	TP	TC	Key Word	Frequency
1	Journal of International Business Studies	12	2547	United States	126	16741	strategic alliances	105
2	Strategic Management Journal	11	4874	United Kingdom	49	2749	knowledge management	89
3	Journal of World Business	9	235	Taiwan	29	355	knowledge transfer	60
4	Research Policy	9	399	China	27	587	joint ventures	45
5	International Business Review	8	391	Australia	26	591	international joint ventures	37
6	Journal of Business Research	8	443	Canada	24	2650	knowledge acquisition	35
7	Management international review	8	123	France	21	1245	Innovation	32
8	Journal of Knowledge Management	7	242	Spain	18	416	knowledge based systems	31
9	Industrial Marketing Management	6	237	South Korea	15	307	absorptive capacity	26
10	Management Decision	6	227	Germany	11	474	knowledge sharing	24
11	Ieee Transactions on Engineering Management	5	119	Italy	11	165	technology transfer	24
12	Journal of High Technology Management Research	5	594	Finland	10	455	Industry	21
13	Technovation	5	270	Hong Kong	10	566	Learning	20
14	British Journal of Management	4	224	Netherlands	9	247	China	19
15	Engineering, Construction and Architectural Management	4	66	Denmark	7	245	strategic planning	19
16	International Journal of Human Resource Management	4	156	Indonesia	7	224	Knowledge	18
17	Journal of Business and Industrial Marketing	4	64	Singapore	7	2010	competition	15
18	Journal of Management Studies	4	1613	New Zealand	6	233	organizational learning	15
19	Journal of Technology Transfer	4	209	Switzerland	6	219	knowledge creation	13
20	Technological Forecasting and Social change	4	190	Viet Nam	6	347	information management	12

Source: Scopus data base, TC: total citation, TP: total publication





**Figure 1. Annual Publication trend**



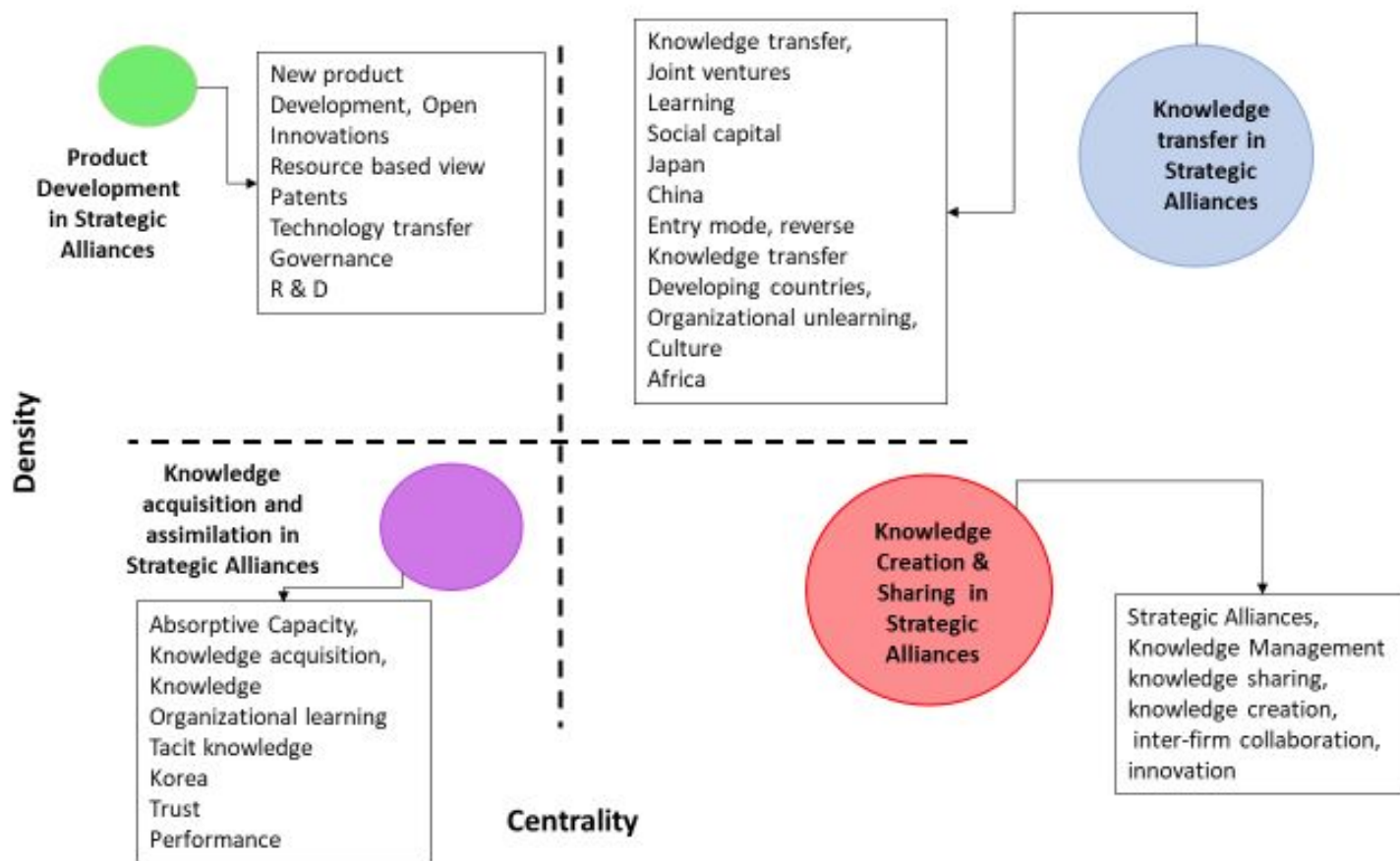


Figure 2 Strategic Map of KM research in Strategic Alliance Context

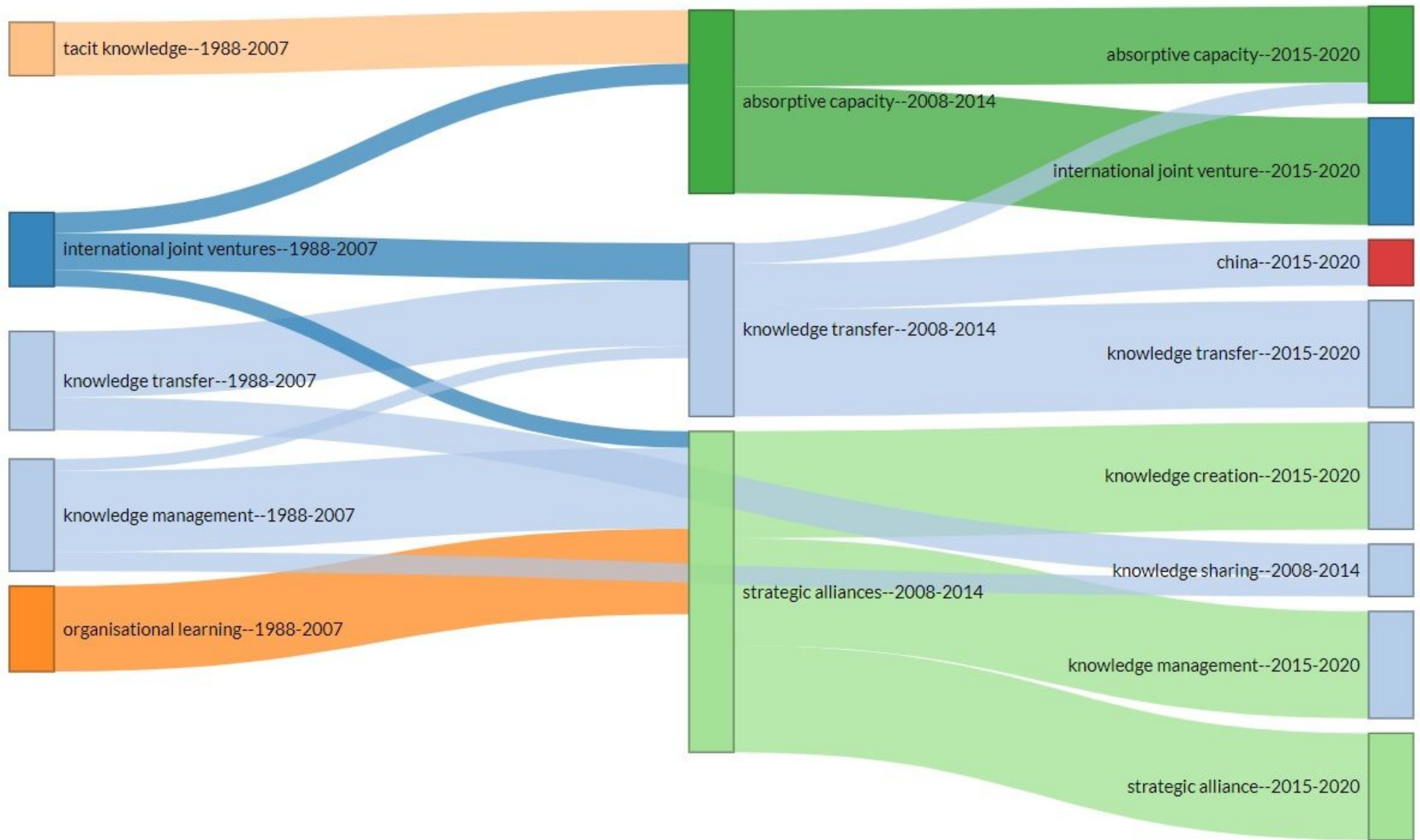


Figure: 3 Sankey Diagram of KM Research in Strategic Diagram

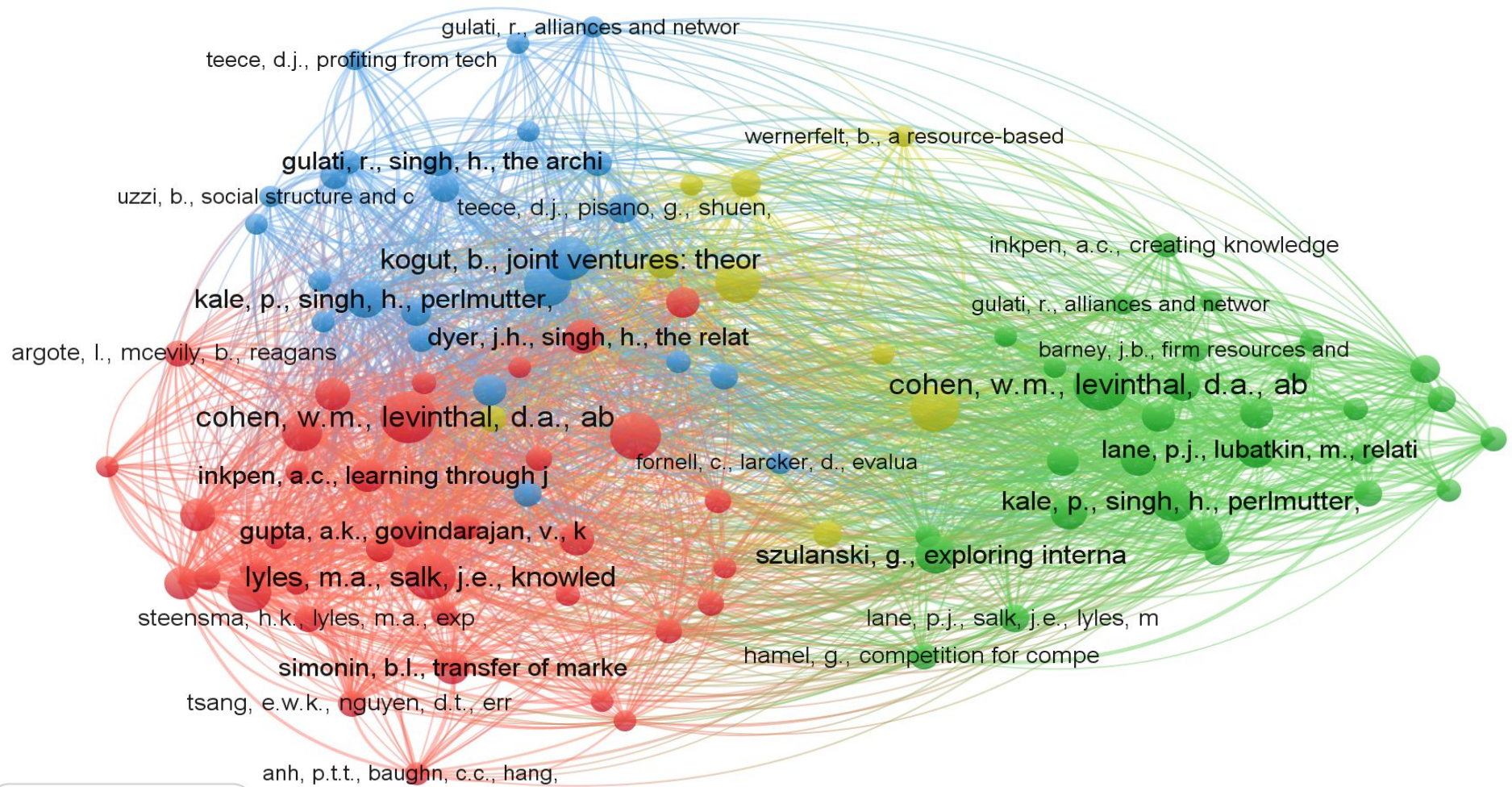


Figure 4: Co-citation network of top 100 secondary documents with greatest link strength

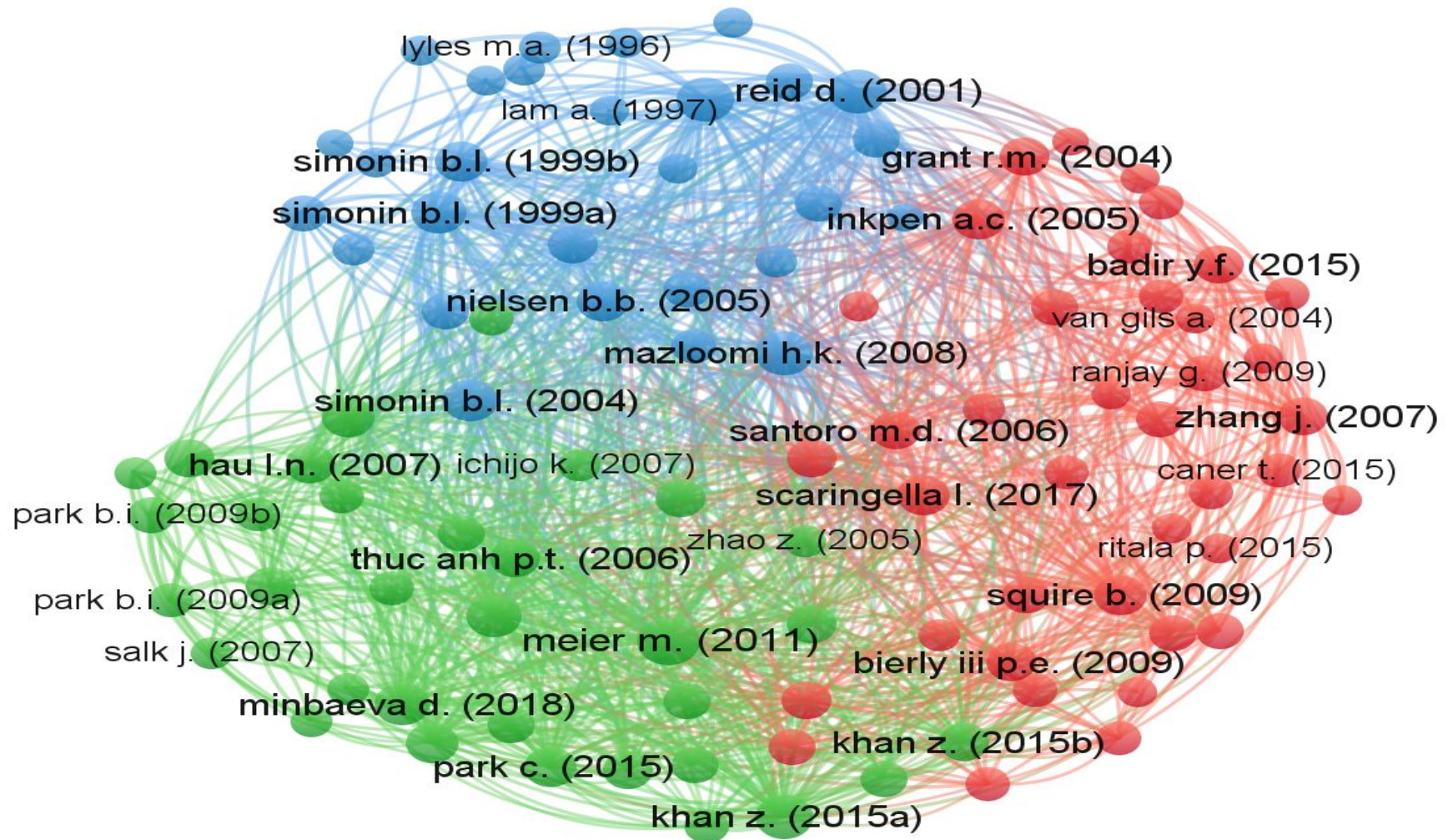


Figure 5: Bibliographic coupling network of top 100 primary documents with greatest link strength