







Knowledge Management Practices: Innovation the Path to Organizational Performance

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Abstract. This paper investigates the current state of organizational knowledge management practices (KMP) to shed light on how the implementation of a knowledge management system impacts corporate performance. To this end, we include 52 research articles published in the high-ranked Information Systems (IS) journals from 2010 to 2021 to capture the continuously updating of research in the IS domain. Based on several bibliometric analyses using computer-aided qualitative data analysis software, we first survey relevant studies on KMP and diverse aspects of organizational performance (OP) such as finance, human resources, leadership, production, business relationship, and innovation. We use survey results to present the evolution of concepts, key themes, and research trends. We then demonstrate the research problems, particularly the limitations of existing studies on KMP and OP, and how these issues constitute knowledge gaps in the field. Building on these findings, we develop an object-oriented framework for representing the path of influence between KMP and OP. This paper presents an exploratory direction for academia, firms, and practitioners to further their of knowledge management practices and the criticality of innovation as a pathway to organizational performance.

Keywords: Knowledge management · Knowledge management practices · Organizational performance · Innovation

1 Introduction

In the last twenty years, interests in knowledge management practices (KMP) have been establishing among organizational performance (OP) studies [13, 52]. Alavi and Leidner [1] believe that KMP, which frequently depends on information technology (IT), would lead to a robust shift in firm performance such as improving internal communication, staff engagement, problem-solving, financial performance, team performance, innovation, and business strategy [5, 84]. As knowledge becomes inherently more consistent, safer, and faster in transferring, firms invested in KM systems show a remarkable transformation of internal communication and a decline in operational costs [12, 20]. Even though the implementation of KM systems has been proven to be crucial for organizations, the design of KMP is generally a challenge for managers. The success of such practices depends heavily on the optimal choice · for other

organizational factors as a whole [17]. Therefore, there is a growing interest in KMP research from both academia and firms.

In addition to several symbolic qualitative research that laid the crucial conceptual framework and theoretical foundation for KM discipline [14, 58], a growing number of quantitative studies aim to test and measure the impact of KMP on OP using precise modeling methods. These works have been carried on large-scale datasets to efficiently deliver reliable empirical evidence that shows the significant effects of KMP on firm performance. Nevertheless, the descriptive analysis might not efficiently cover all the aspects of KMP and OP [88]. These studies generally focus on knowledge processes and/or practices on the financial performance of firms. Although there are several reviews regarding KMP and firm performance, we argue that KMP's path of influence to OP has received insufficient attention. For instance, in the exploratory study on KM and firm performance by Zack et al. [88], they did not provide a framework to address the relationships between KMP and firm performance adequately. Existing studies mainly focus on using data from literature review to assess the impact of KMP on OP [8, 32, 42], critical success factors of KMP impact on OP [79], KMP in the association of different configurations of intellectual capital and firm performance [30, 64, 83], and KMP and innovation [4, 22, 27, 73].

Existing literature displays a lack of concrete and systematic review of the current state of the art on the influence that KMP has on OP. This paper aims to deliver further insights into the relationship between KMP and firm performance by answering three research questions: (1) How do constructs of KMP and OP develop over time; (2) What aspects of OP absorb the impact of KMP, and what is the path of influence; and (3) What are the limitations/knowledge gaps of this research area? In seeking answers to these questions, we propose an object-oriented framework to address the path of influence between objects. While performance is a metric per se, we will include firm performance and KMP into the object-oriented framework to provide further insights on how these objects related to each other. Our work contributes to common knowledge and practices in several ways: (i) a thematic evolution of KMP and OP; (ii) a framework for assessing the relationship between KMP and OP; and (iii) an exploratory theme to support future research. We organize the paper as the following. Section 2 describes our research methodology. The material collection process is denoted in Sect. 3, followed by descriptive analysis in Sect. 4. Next, the findings are presented in Sect. 5. Section 6 details the material evaluation, and relevant discussions are presented in Sect. 7 before we conclude our paper in Sect. 8.

2 Research Methodology

This paper follows the literature review method outlined by Mayring [53] and bibliometric analysis using R programming language proposed by Nobre and Tavares [57] to provide a comprehensive systematic literature review. Mayring [53] denotes four steps in the content analysis method: material collection, descriptive analysis, category selection, and material evaluation. Nobre and Tavares [57] suggest that the bibliometric analysis method consists of citation analysis, network analysis, bibliographic coupling, cluster analysis, and findings. Both review and analysis methods have been recognized

for their quality by publications in high-ranked IS journals. We thus follow the above framework to carry on this research. The four steps of our systematic literature review method are literature search, descriptive analysis, bibliography analysis, and findings.

Following the above methodology, we employ computer-aided qualitative data analysis software, an effective tool for conducting bibliometric analysis. We use the bibliometrics library in R programming to operate descriptive analysis, factorial analysis, and multifactor correspondence analysis. While descriptive analysis assists this paper in defining research trends, factorial and multifactor correspondence analyses are helpful to define concept revolution, literature clusters, author impact, conceptual structure, intellectual networks, current gaps, and tendency.

3 Literature Collection

Due to KMP and firm performance involve emergent concepts, information and communication technology, and information systems (IS), the review sets out to cover literature published in the last decade (from 2010 to 2021). This setting is to observe the evolution of critical concepts adequately. The search strings were developed to search by topic using exactly the search string of “knowledge management” practice* AND (organizational performance* OR firm performance*).

There are three layers in the literature search procedure, i.e., search on Google Scholar, search on leading journals, and search on the academic databases. The search strings remain the same in three layers. In the Google Scholar search layer, the search result gave us an initial picture of the existing studies in the review period. We then filtered out qualified and relevant articles published in the leading IS journals using the Advanced search function. We obtained 45 articles from the first and second search layers. Next, we use the same search strings to search on Web of Science (WoS) and Scopus databases. In this layer, the articles were sorted by descending order of citations. We then cross-checked the search results from the academic databases and Google Scholar to eliminate duplication and add essential studies. Finally, we selected 52 scientific articles to conduct bibliometric analysis.

4 Descriptive Analysis

Dodge and Commenges [16] argue that descriptive analysis is not to learn about the population but to summarize the data. Thus, descriptive analysis is typically to calculate the mean and standard variable, representing the central tendency and variability or dispersion of a dataset. In this paper, a total of 52 scientific articles published between 2010 to 2021 were taken into the descriptive analysis (Fig. 1). Our purpose in carrying on the descriptive analysis is to: (i) present an overview of research trends in KMP and OP, (ii) deliver interesting insights into the scientific domain, and (iii) establish supportive ground for further classification structure. Our descriptive analysis embedded two main criteria, including distribution of publications in the thematic area and source impact measurements based on total citations. Figure 1 indicates annual production and respective total citations of the selected articles.

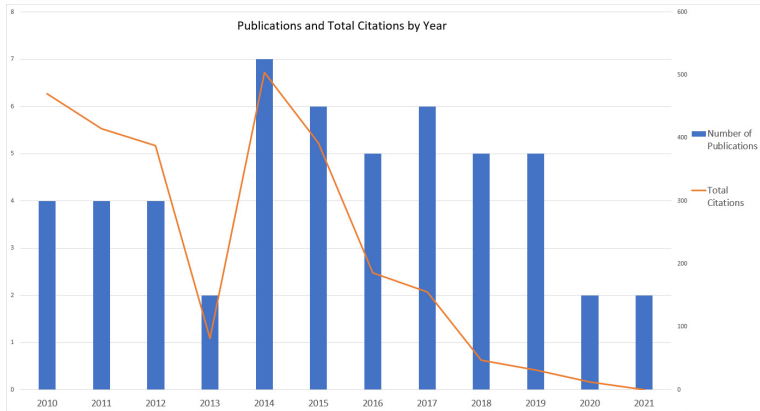


Fig. 1. The numbers of publications and total citations per year

It is notable that the numbers of publications and total citations had significantly increased in the period from 2014 to 2019, reaching the peak in 2014 with total citations of 504 for seven publications. This upward trend in research on KMP and OP could also be seen in the database search layer. It reflects the growing interest in the research area from academia. Although the number of publications from 2010 to 2012 remained the same, the citations rocketed for these scientific articles. This result indicates that the selected articles have received a high volume of citations, reflecting the recognition from academia. The total amount of citations would be one of the indicators to justify the quality of the selected articles in this literature review.

Regarding publication sources, studies on KMP and firm performance have been widely acknowledged in high-ranked IS journals. It is evident that all the articles selected in this review were from qualified sources. Significantly, the substantial number of citations over publication sources reveals that although the research domain of KM and OP is mature, the source impact tends to keep expanding. The high volume of citations highlights the potential of research on KMP and OP. This result also proves that the articles chosen for this literature review are outstanding and thus could represent a typical research stream in IS domain.

5 Findings

5.1 Concepts

The survey results of selected articles on KMP and OP show a solid bond to the concepts of organizational knowledge creation, tacit and explicit knowledge [58, 59], KMP [71], KM strategy [88], organizational KM [28] (Fig. 2). From these prior perspectives, Lee and Choi [42] define knowledge processes as the representation of fundamental operations of knowledge and enabler is essential infrastructure for firms to improve knowledge processes efficiency. On the other hand, firm performance could be addressed as the level to which firms meet their targeted propositions. Lee et al. [43]

develop a novel metric, namely, knowledge management performance index (KMPI), to measure OP under the implementation of a KM system. This metric could assign value and measure firms’ intangible assets, for instance, financial index, stock price, and R&D expenses. Lee et al. [43] argue that KMP could impact the performance of workflow, processes, and management activities. Researchers thus can assess the relevant management performance by measuring the quality of organizational knowledge.

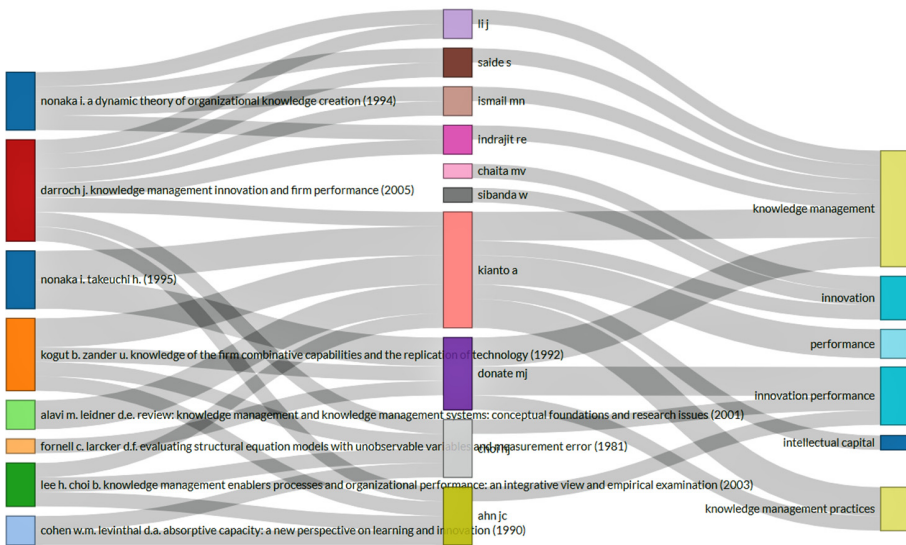


Fig. 2. Three fields plot of key concepts (reference sources-authors-concepts)

Andreevat and Klanto [2] suggest that KMP could be referred to as a set of management activities that allow organizations to produce value from knowledge assets. KM processes include phases such as knowledge creation, sharing, acquisition, and application. From a knowledge-based perspective, firm performance might be varied due to the discrepancy between their stocks of knowledge and capabilities of implementing knowledge applications. KMP thus could typically be seen as an integration of knowledge processes and firms’ capabilities in supporting and advancing knowledge processes [28]. Donate [18] classifies KMP into two modes, namely, KM exploration practice (i.e., creation) and KM exploitation practice (i.e., storage, transfer, and application). Donate and Snchez de Pablo [19] believe that leadership is a critical factor that influences organizational KM. They measure the impact of knowledge-oriented leadership on several aspects of KM processes: knowledge creation, knowledge transfer and sharing, and knowledge application. They prove that KMP significantly impacts product innovation performance. Additionally, organizational KMP displays a vital role in the knowledge-oriented leadership of firms. Figure 2 illustrates the analysis of the three fields, i.e., key concepts, relative authors, and the reference sources.

The three fields analysis was conducted using R programming algorithm to define the unique terminology and associated references sources of the articles in review. We first calculated the broad area of indexed keywords and compared how the key concepts were connecting. We then selected the most outstanding concepts to represent in the form of a three fields plot. From Fig. 2, it is evident that the concepts of KM, KMP, and intellectual capital have intertwined in the studies of innovation, OP, and innovation performance. This means the research area of KMP relates to a broader domain, i.e., KM and intellectual capital. Similarly, the concept of performance bonds with innovation performance. Figure 2 represented a strong connection between KM, KMP, and symbolic studies in IS (reference sources), supporting our research focus and findings.

5.2 Conceptual Structure

The thematic map of concepts generally refers to the concept maps obtained from the thematic synthesis. Using bibliometric analysis with the assistance of R programming algorithm, the clusters of key concepts were obtained (Fig. 3). The inclusion index was weighted by word occurrences in the selected studies. We then developed a thematic map that describes synthesis results from 52 papers. Figure 3 displays key concepts and their relational networks. It visualizes the relatedness between KM and firm performance that was distributed into two main clusters. Each color represents one cluster connecting its network actors by the same color lines.

Analysis results show that “knowledge management” is the core concept inter-linked to two main clusters. Notably, based on analysis results, we found that the concept of “innovation” establishes a broad network throughout two main clusters. This finding supports descriptive analysis results that were presented in the three fields plot of key concepts. Figure 3 shows multiple concepts of KMP link to diverse aspects of OP. In contrast, “OP” and “performance” create a cluster with relevant aspects of organizational KM systems, “firm performance” and “financial performance” bond to relevant aspects of KM and operational management. Based on the above analysis results, we summarized characteristics of OP and their respective clusters with KMP, and we then mapped the concepts back to the articles. We present the results in Table 1.

We provide further insights into the conceptual structure by carrying on a multiple correspondence analysis (MCA) [60], on the indexed keywords of the selected articles. The obtained results show the categories and hierarchical dimensions of the key concepts. It appears that while innovation and KM are at a lower level in information management, industrial research and OP are also interconnected. Knowledge-based systems and knowledge sharing are at the same levels of clusters under knowledge acquisition. This analysis results justified the significant relationships between industry, OP, KM, and information management. In the MCA analysis, dimensions are addressed in structured groups constituted by several sets of variables. We considered all the indexed keywords as individual variables and calculated the contribution of active variable groups to measure distances between variables. We used the Bibliometrix library (for MCA analysis) and multiple visualization packages (for data

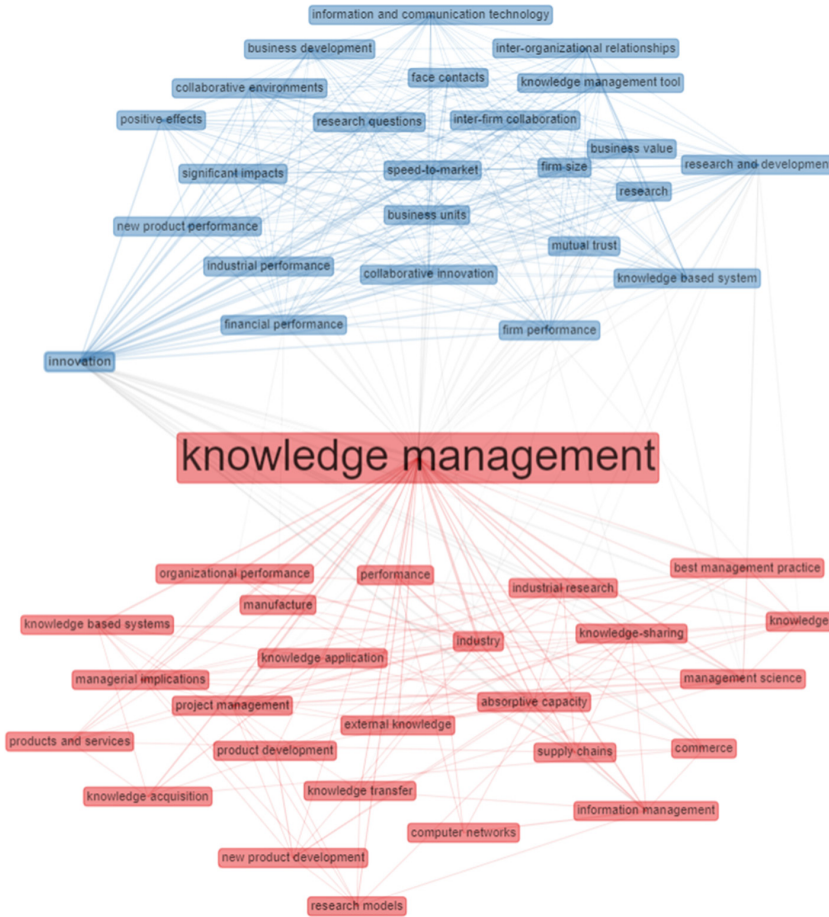


Fig. 3. Clusters of concepts

Table 1. OP’s clusters

Concepts	Associated word clusters	References
<i>Firm performance, financial performance, industrial performance</i>	New product performance, information and communication technology, industry, knowledge management tool, collaborative environment, business development, inter-organizational relationships, inter-firm collaboration, positive effects, significant impacts, collaborative innovation, knowledge-based	[5, 6, 10, 24, 32, 38, 39, 41, 46, 48, 49, 56, 61, 63, 66, 67, 69, 70, 78, 86]

(continued)

Table 1. (continued)

Concepts	Associated word clusters	References
	system, business value, research and development, business value, business units, speed-to-market, mutual trust, innovation. (1)	
<i>OP, performance</i>	Knowledge based systems, knowledge sharing, knowledge, knowledge application, external knowledge, knowledge acquisition, knowledge transfer, absorptive capacity, information management, best management practice, industrial research, management science, commerce, supply chains, manufacture, industry, computer networks, research models, product development, products and services, managerial implication. (2)	[3, 15, 26, 33–37, 51, 54, 56, 62, 66, 76, 80–83, 85, 89, 90]
<i>Innovation</i>	Involved in all nodes of cluster (1) and multiple nodes of cluster (2) such as performance, industrial research, best management practice, industry, knowledge sharing, knowledge, absorptive capacity, supply chains, commerce, and information management	[5, 6, 8, 10, 17–19, 24, 27, 32, 35, 37, 49, 61, 63, 66, 67, 69, 70, 72, 76, 78, 85, 86, 89]

visualization) from R. We put efforts to address the most critical variables that represent dimensions. We organized variable groups as below: (i) a group of variables that specifies the discipline of KM and KMP, including the variables that are relevant to theoretical approaches and research models; and (ii) a group of variables representing the factors of firms that would receive influences of the first group. Due to multiple sets of variables being considered simultaneously, we tried to balance the impact of the individual set by weighting the variables during the analysis, i.e., assigning the same weighting value to variables in the same group. In other words, the same variables in one group might be different in another group. Nevertheless, the nature of variables remains the same in the given groups [31]. Following the MCA analysis, we delivered an observation that contains (i) a set of variables that describes the KMP dimension and (ii) another set that describes OP dimension (Fig. 4).

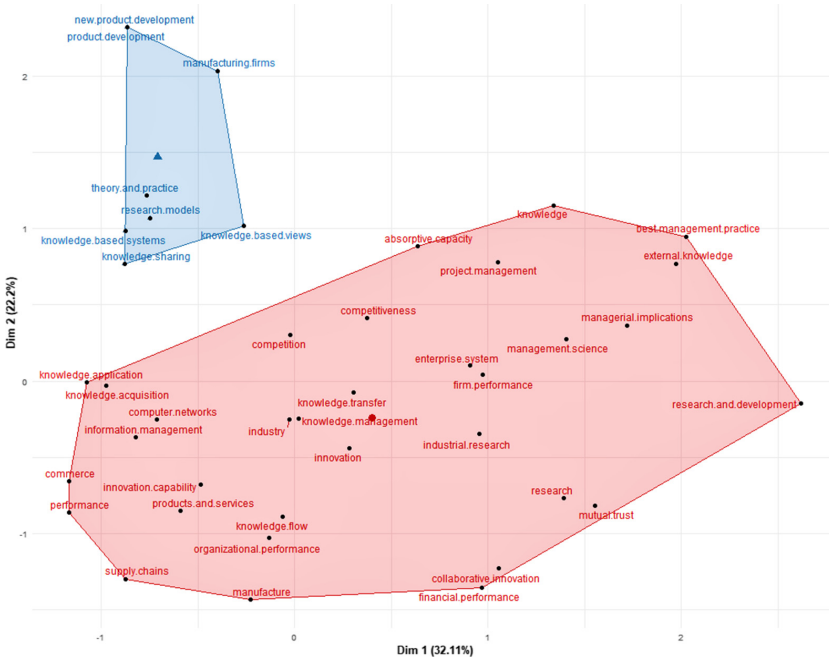


Fig. 4. Conceptual structure map using MCA method

Figure 4 shows the distinguished level of correlations between KMP and OP. The MCA results indicate that KMP relevant concepts are closely associated with firm performance, as suggested by prior qualitative studies [10, 24, 25, 58, 59, 88] and quantitative studies [2, 9, 13, 18]. In addition, the analysis results reveal a tighter correlation of OP in dimension 1 at 32.11%. The second dimension, which represents KMP, shows a lower correlation rate at 22.2%. In the first dimension, significantly, the variable “financial performance” reaches the highest value of the dimension, representing the value of the “performance” dimension. In the second dimension, “knowledge sharing,” “knowledge base system,” and “knowledge-based view” are the three key variables to observe. And these three variables are positively correlated with variables in OP clusters in both dimensions. These analysis results are similar to findings claimed by multiple earlier review studies [20, 50, 77].

5.3 Intellectual Structure

The intellectual structure analysis is to give insights into the outstanding contributors of the field. The bibliometric analysis results indicate that existing studies on KMP and OP were developed on the ground of high impact authors such as Fornell [23], Nonaka [58, 59], Cohen [11], Kogut [40], Szulanski [71], Grant [29], Zack [88], Gold [28], Alavi and Leidner [1], Zahra [90], Lee [44], and others. Analysis results on collaboration networks display a dominant collaboration between North America, Europe, Oceania, and North-East Asia. This result figures out the missing collaboration between other regions such as other European countries, Russia, and Oceania.

5.4 Object-Oriented Analysis

According to El Sawy and Majchrzak [21], KMP requires the integration of multiple perspectives. The classifications of KMP and OP thus are extra complex due to the multidimensional aspect. In seeking a solution that could help effectively addressing the relationships between KMP and OP, this study develops an object-oriented framework that acts as a categorization method. In this framework, each dimension of KMP and OP would be viewed as an object. Subsequently, we carry on a comparative analysis regarding the occurrences of objects and the association of arguments under these objects. The asterisk (*) represents the occurrence. In this object-oriented framework, we defined the reference-type arguments under KMP and OP objects. This means in our analysis, KMP might have a cluster with one argument (which represents one typical aspect) of OP. However, this argument might have another independent object (which is OP) that references it. In other words, one argument is related to two objects in the form of variable references. Following this framework, the details of objects in each study and their referenced factors will be properly illustrated. The analysis results of two fields (KMP and OP) would also reveal the gaps of the research domain: which areas are the mature research domain and which areas lack attention (Fig. 5).

Following the proposed framework, we conduct a further investigation on selected articles to deliver a comprehensive classification from multiple perspectives. The results show three main classes categorized based on research methods, i.e., design science research (main class 1), qualitative research (main class 2), and quantitative research (main class 3) (Fig. 6). Figure 5 and Fig. 6 indicate a mature image of research on KMP on OP with studies that sufficiently covered a wide range of both two research domains. Remarkably, they show that studies on KMP often simultaneously focus on knowledge creation, knowledge sharing, knowledge acquisition, and knowledge application. Similarly, studies on OP are often clustered with financial or economic performance and innovation. It is noteworthy that innovation is likely involved in almost all reviewed studies.

The frequent occurrence of innovation object across studies of KMP and OP might be a result of the high involvement between KMP and IT. This finding matches with the prior analysis results of conceptual structure in Sect. 5.2. It reveals that the significant path of influence that KMP produces to OP is likely via innovation and IT. Nevertheless, analysis results also reveal several issues of the current research on KMP and OP. We summarize these issues as follows.

Figure 5 could also be seen as a pre-mature state of research on KMP and leadership performance. Although several studies have been carried on KMP's influence on organizational strategy [9, 72], leadership styles, and management culture [6, 41], the rapid development of new technology would lead to a lack of further investigation on how and to what extent KMP would produce an additional impact on leadership performance.

In addition, the classification in Fig. 6 shows a short in research using design science research and qualitative methods. Current studies on KMP and OP display a dominant tendency of main class 3, representing quantitative research. Notably, most studies throughout three main classes were carried on under a positivism perspective,

No.	Authors	Year	Object												
			Knowledge					Performance							
			Creation	Sharing/ Transfer	Acquisitio n/Storage	Application /Practice	Style/ Strategy	Capability	Finance/ Economic	Innovation	Team/HR/ Culture	Leadership	Business relationship	Production	
1	Yan M.-R.	2021				*		*							
2	Lee M.-C.	2021	*	*									*		*
3	Williams & Mullane	2020				*				*					
4	Chaita & Sibanda	2020						*		*	*				
5	Marabelli & Newell	2019	*	*	*	*		*	*						
6	Gloet & Samson	2019						*		*					
7	Kaminska & Borzillo	2019					*		*	*	*				*
8	Valmohammadi & Ahmadi	2019	*	*	*			*					*		
9	Radaelli et al.	2019		*			*		*			*			
10	García-Merino et al.	2018	*	*	*	*			*						
11	Segarra-Ciprés et al.	2018	*	*	*	*		*	*		*	*			
12	Li et al.	2018	*	*	*	*		*	*		*		*		
13	Choi et al.	2018			*				*	*			*		
14	Taghizadeh et al.	2018		*			*	*				*			
15	Joshi & Chawla	2017		*			*		*						
16	Sheng M.L.	2017	*	*	*				*	*	*				
17	Pérez-Luño et al.	2017		*			*						*		
18	Durmuş-Özdemir & Le & Lei	2017				*			*	*	*				
19	Turulja & Bajgorić	2017		*					*	*			*		
20	Khachlouf & Quélin	2016				*		*	*	*	*				
21	Chang et al.	2016	*	*	*	*		*	*	*	*				
22	Sun & Hou	2016	*	*	*			*	*	*	*				
23	Qin et al.	2016	*	*	*			*	*	*	*				
24	Jyoti & Rani	2016		*									*		
25	Hussinki et al.	2015			*			*	*				*		
26	Chen et al.	2015		*	*	*		*				*			
27	Mao et al.	2015	*	*	*	*		*	*	*	*				
28	Yang et al.	2015			*	*		*	*	*	*		*		
29	Van Reijnsenet al.	2015	*	*	*	*		*	*	*	*		*		
30	Vicente-Olivaet al.	2015	*	*	*	*	*	*	*	*	*		*	*	
31	Donate & Guadamillas	2014		*	*	*		*	*	*	*		*		
32	Zhang et al.	2014	*	*	*	*		*	*	*	*		*		
33	Donate & Sánchez de Pablo	2014		*	*	*		*	*	*	*		*		
34	Villar et al.	2014	*	*	*	*		*	*	*	*		*		
35	Singh P.J., Power D.	2014		*	*	*		*	*	*	*		*		
36	Popaltoon & Siengthai	2014		*		*		*	*	*	*		*		
37	Wang et al.	2014		*	*	*		*	*	*	*		*		
38	Upparini et al.	2013				*		*	*	*	*		*		*
39	Najafi Tavani et al.	2013	*	*	*	*		*	*	*	*		*		*
40	Delen et al.	2012	*	*	*	*		*	*	*	*		*		*
41	Fugate et al.	2012	*	*	*	*		*	*	*	*		*		*
42	Andreeva & Kianto	2012		*		*		*	*	*	*		*		*
43	Cao Y., Xiang Y.	2012	*	*	*	*		*	*	*	*		*		*
44	Li et al.	2011		*		*		*	*	*	*		*		*
45	Miranda et al.	2011		*		*		*	*	*	*		*		*
46	Hong et al.	2011		*		*		*	*	*	*		*		*
47	López et al.	2011		*		*		*	*	*	*		*		*
48	Young et al.	2010	*	*	*	*		*	*	*	*		*		*
49	Vaccaro et al.	2010	*	*	*	*		*	*	*	*		*		*
50	Joshi et al.	2010			*			*	*	*	*		*		*
51	Ko D.-G.	2010			*			*	*	*	*		*		*

Fig. 5. Two-fields object occurrences

i.e., providing evidence to prove theory [55]. This finding reflects a lack of attention towards theory-building perspective using qualitative research methods such as field study and grounded theory. Additionally, there was no appearance of research conducted under a critical perspective.

No.	Class	Author	Year	Philosophical Perspective	Methodology	Model/ Data Analysis	Data Unit	Data Collect	Approach
1	Main Class 1	Yan M.-R.	2018	Post.	DSR	Strategic Decision Support System (SDSS)	2 business cases	Simulated	System dynamic
2		Lee M.-C.	2016	Int.	DSR	Conceptual model	N/A	Simulated	Resource-based view
3	Main Class 2	Williams & Mullane	2019	Int.	Qual	Hermeneutic	concepts	LR	Resource-based view
4		Chaita & Sibanda	2021	Int.	Qual. Case	Hermeneutic	4 firms	Survey	Innovation behavior
5		Marabelli & Newell	2019	Int.	Qual. Case	Synthesis	1 firm	Survey	Practice-based
6		Gloet & Samson	2016	Int.	Qual. Case	Crosscase analysis	16 firms	Survey	Innovation capability
7		Kaminska & Borzillo	2016	Int.	Qual. Case	Hermeneutics	1 firm	Survey	Longitudinal
8		Valmohammadi & Ahmadi	2015	Int.	Qual. Case	Factor analysis	3 firms	Survey	Balanced scorecard
9		Radaelli et al.	2011	Int.	Qual. Case	Interpretive analysis	3 firms	Survey	Mediating effect
10		García-Merino et al.	2010	Int.	Qual. Field	Hermeneutics	1 firm	Survey	Intangible asset
11		Segarra-Ciprés et al.	2014	Int.	Qual. LR	Interpretive analysis	Literature	Archival	Accessing knowledge
12	Main Class 3	Li et al.	2021	Post.	Quan. Emp.	Structural equation modeling (SEM)	173 firms	Survey	Ethics theory
13		Choi et al.	2020	Post.	Quan. Emp.	SEM	285 firms	Survey	Community practice
14		Taghizadeh et al.	2020	Post.	Quan. Emp.	SEM	202 owners	Survey	Environmental dynamism
15		Joshi & Chawla	2019	Post.	Quan. Emp.	Conceptual model	313 respondents	Survey	Literature review
16		Sheng M.L.	2019	Post.	Quan. Emp.	SEM	205 firms	Survey	Dynamic capabilities
17		Pérez-Luño et al.	2019	Post.	Quan. Emp.	Multi-item scales and indexes	105 firms	Survey	Cross functional Integration
18		Durmuş-Özdemir & Abdulkoshimov	2018	Post.	Quan. Emp.	Factor analysis	59 respondents	Survey	Competitiveness-based view
19		Le & Lei	2018	Post.	Quan. Emp.	SEM	56 firms	Survey	Trust-based view
20		Turulja & Bajgorić	2018	Post.	Quan. Emp.	SEM	N/A	Survey	Mediating effect
21		Khachloui & Quélin	2018	Post.	Quan. Emp.	SEM	43 firms	Survey	Managerial ties
22		Chang et al.	2017	Post.	Quan. Emp.	SEM	499 responses	Survey	Knowledge intensive
23		Sun & Hou	2017	Post.	Quan. Emp.	SEM	800 firms	Survey	Stock and flow
24		Qin et al.	2017	Post.	Quan. Emp.	SEM	225 firms	Survey	Cultural distance
25		Jyoti & Rani	2017	Post.	Quan. Emp.	SEM	304 responses	Survey	Work system
26		Hussinki et al.	2017	Post.	Quan. Emp.	Difference in difference	259 firms	Survey	Mean differences
27		Chen et al.	2017	Post.	Quan. Emp.	SEM	1012 data	Archival	SECI Model
28		Mao et al.	2016	Post.	Quan. Emp.	Regression analysis	168 firms	Archival	IT resources
29		Yang et al.	2016	Post.	Quan. Emp.	SEM	137 respondents	Survey	Social exchange
30		Van Reijnsen et al.	2015	Post.	Quan. Emp.	SEM	55 firms	Survey	Dynamic capability
31		Vicente-Olivaet al.	2015	Post.	Quan. Emp.	Descriptive statistics	69 responses	Survey	Absorptive capacity
32		Donate & Guadamillas	2015	Post.	Quan. Emp.	SEM	111 firms	Survey	Knowledge-based
33		Zhang et al.	2015	Post.	Quan. Emp.	SEM	276 firms	Survey	Absorptive capacity
34		Donate & Sánchez de Pablo	2015	Post.	Quan. Emp.	SEM	Four industries	Survey	Knowledge-based
35		Villar et al.	2014	Post.	Quan. Emp.	SEM	157 firms	Survey	Dynamic capability
36		Singh P. J., Power D.	2014	Post.	Quan. Emp.	SEM	418 firms	Survey	Knowledge-based
37		Popaitoon & Siengthai	2014	Post.	Quan. Emp.	SEM	198 projects	Survey	Project team
38		Wang et al.	2014	Post.	Quan. Emp.	SEM	288 responses	Archival	Mediating effect
39		Lipparini et al.	2014	Post.	Quan. Emp.	Multiple phase model	982 projects	Survey	Knowledge dynamics
40		Najafi Tavani et al.	2013	Post.	Quan. Emp.	SEM	161 firms	Survey	Firm capacity
41		Delen et al.	2013	Post.	Quan. Emp.	Machine learning	277 firms	Survey	KM implementation
42		Fugate et al.	2012	Post.	Quan. Emp.	SEM	336 responses	Survey	Global manufacturing
43		Andreeva & Kianto	2012	Post.	Quan. Emp.	SEM	234 firms	Survey	ICT and HRM for KM
44		Cao Y., Xiang Y.	2012	Post.	Quan. Emp.	SEM	399 employees	Survey	"Guanxi" effect
45		Li et al.	2012	Post.	Quan. Emp.	SEM	411 firms	Survey	Collaborative KM
46		Miranda et al.	2011	Post.	Quan. Emp.	Regression analysis	218 firms	Survey	KM capability
47		Hong et al.	2011	Post.	Quan. Emp.	SEM	285 projects	Survey	Strategic fit
48		López et al.	2011	Post.	Quan. Emp.	SEM	310 firms	Survey	Strategic KM
49		Young et al.	2010	Post.	Quan. Emp.	SEM	743 individuals	Survey	Resource-based view
50		Vaccaro et al.	2010	Post.	Quan. Emp.	Factor analysis	113 respondents	Survey	KM tools
51		Joshi et al.	2010	Post.	Quan. Emp.	Multiple phase model	110 firms	Archival	IT-enabled
52		Ko D.-G.	2014	Int.	Quan. LR	Interpretive analysis	Literature	Archival	Mutual trust effect

*Abbreviations: LR: literature review, Post.: Positivistic, Int.: Interpretive, Quan.: Quantitative, Qual.: Qualitative, N/A: Not applicable, Field: Field study, Emp.: Empirical, DSR: Design Science Research.

Fig. 6. Literature classification

6 Research Methodology Evaluation

This paper follows the qualitative research framework outlined by Myers [55] and the systematic review method [53, 57]. The rigor of this paper thus could be seen in multiple aspects. Firstly, this review followed a rigorous search procedure with evidence of search strings provided. Secondly, the selected articles were published in high-ranked IS journals with a substantial number of total citations that indicate the recognition from academia is sufficient to represent the research mainstreams. Finally, the use of computer-aided qualitative data analysis software, particularly the bibliometrix library of the R programming [60], in conducting multiple types of bibliometric analysis such as descriptive, MCA, and comparative analysis produce precise and consistent results. The relevance and rigor could eliminate the restraint of the number of articles in review ($n = 52$).

7 Discussion

Literature reviews on KMP usually have problems with the complex and multidimensional definition of knowledge [1]. Although the concept of KMP has gradually become a common term in the OP research area, existing studies often use one aspect of KMP to assess one to few indicators of firm performance. This one aspect assessment produces difficulties in delivering a precise measurement model of the impact that organizational KM has on OP [46, 77, 81]. This review treats the aspects of both KMP and firm performance as “objects” in assessing the occurrences of concepts to overcome this challenge. By which, it would mitigate the problems in categorizations. The limitation of this review would lay in the restraint in the number of the selected article ($n = 52$). This paper might miss some exploratory concepts and aspects of studies on organizational KM and firm performance. Nevertheless, the selected articles were published in high-ranked IS journals with a substantial number of total citations. Thus, it could deliver reliable analysis results. Overall, KMP is found directly associated with several types of measurement on OP such as finance, economic, operation, innovation, human resource, team, and leadership. The measure of OP shows a strong bond with financial performance or financial indicators. From this perspective, several studies argue that although KMP improves one typical type of OP, it will result in overall a positive financial performance [65, 87, 88]. The connection between OP and financial performance thus could extend to the areas of intermediate OP under the indirect impact of KM. We expect this could provide a direction for future research.

It is necessary to mention the argument regarding the path of influence that KMP produces on OP. The analysis results show a significant cluster between innovation and KMP. As KM systems and KMP are basically constructed on IT [68, 75], it would show that IT is the core factor that drives to firm’s innovation [45, 50] and would be a primary element that constitutes the path of influence for KMP to impact organizational innovation [47, 74]. Therefore, the innovation factor would be concerned as an aspect of OP and should be an independent object that might impact both KMP and OP. This finding is interesting as most existing studies lack focus on the KMP’s path of influence on OP and thus only consider innovation as one aspect of OP. This might be a

consequence of the dominant research trend using structural equation modeling analysis that leads to a failure in addressing latent variables such as the path of influence. Future qualitative research could focus more on this area to deliver further insights.

8 Conclusion

This paper is a systematic literature review on KMP and OP. By carrying on multiple analyses such as descriptive, MCA, and object-oriented analysis of 52 articles published in the period from 2010–2021 in high-ranked IS journals, we answered three research questions regarding thematic evolution of concepts, KMP's path of influence on OP, and knowledge gaps of the field. Notably, this paper proposes an object-oriented framework to address the relationships between KMP and OP. The proposed framework integrates almost all the relevant aspects of existing studies in assessing KMP and OP. Analysis results show that research on KMP and firm performance should look at the objects in three key fields – KM, OP, and innovation. The assessment results indicate that KMP is directly associated with several types of OP, namely, finance, economics, operation, innovation, human resources, team, and leadership. Nevertheless, the measurement of firm performance usually refers to financial performance or financial indicators. Current literature shows a lack of studies regarding the impact of management style and KM process on new product development strategy and leadership performance. There is a lack of studies using qualitative research methods such as field study and grounded theory. In addition, there is an absence of research conducted under a critical perspective. This literature review delivers to academia, firms, and practitioners a better understanding of knowledge management practices and the vital role of innovation in improving organizational performance.

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