A Systematic Literature Review of Knowledge Mobilisation and Its Support for Business Decisions Over Two Decades (1999–2019)

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Abstract The importance of knowledge and knowledge management (KM) has been widely recognised, from the context of individuals, groups, organisations to the economy. KM has greatly evolved over the last few decades in terms of its processes, life cycles, boundary-spanning mechanisms and facilitating technologies. Knowledge mobilisation, as one of the key stages of the KM process and life cycle, holds the key to the success of organisations' learning and innovation activities, especially in the context of crossing knowledge boundaries to support business decisions. This chapter provides a systematic literature review (SLR) of knowledge mobilisation and its support to business decision-making. The SLR process used includes five well-structured, transparent stages. Key findings from the SLR reveal some important trends of the topic along four key themes of knowledge mobilisation: knowledge boundaries, boundary-spanning mechanisms, facilitating ICT technologies and support for business applications. All these trends will certainly provide insights into future research in knowledge mobilisation and its potential use to improve business decisions.

Keywords Knowledge mobilisation · Business decisions · Systematic literature review · Descriptive analysis · Thematic analysis · Knowledge boundary · Boundary-spanning mechanisms

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1 Introduction

The importance of knowledge has been highlighted at the individual, organisation, and economy levels by a series of well-known expressions, including "knowledge is power", "knowledge-based view (KBV)", and "knowledge economy". It is widely believed that individuals with more knowledge tend to have more decision power hence more influence on others. At the organisational level, KBV emphasises that knowledge, rather than physical resources, is the business asset that gives organisations unique, long-lasting competitive advantage [1, 2]. The term "knowledge economy" emerged to address that the whole economy is driven by knowledge intangibles rather than physical capital, natural resources, or low-skilled labour [3]. Because of the well-recognised importance of knowledge, knowledge management (KM) has become one of the most attractive areas over the last few decades. Even though the term KM started to enter popular usage in late 1980s such as at conferences, most scholars agree that mid-1990s saw KM turning into a distinctive discipline and a field of practice, when experienced a big surge of systematic studies presented through dedicated international conferences and published books. During the period, various definitions of KM were proposed and debated. Spurred by the extremely active research and discussion on KM, devoted international journals were born to publish KM work, including reputable Journal of Knowledge Management which was launched in 1997 and Journal of Knowledge Management Practice in 1999.

Effective KM requires clearly defined and well-structured processes that can provide disciplinary guidance to practice, hence a huge number of KM process models have been proposed over time. A review by Heisig [4] analysed 160 KM process frameworks with a wide range of activities being included and different terms being used sometimes representing similar activities. Liu [1] recently studied different KM activities and classified them into four main stages of a KM process, as illustrated in Fig. 1: knowledge building stage, knowledge holding stage, knowledge mobilisation stage, and knowledge utilisation stage. Three of the four stages—knowledge building, holding, and utilisation—are self-explanatory and easy to understand. Knowledge building stage includes activities happening at the early stage of a KM process, such as knowledge creation, capture, and acquisition. In this stage, usually the amount of knowledge increases through the knowledge
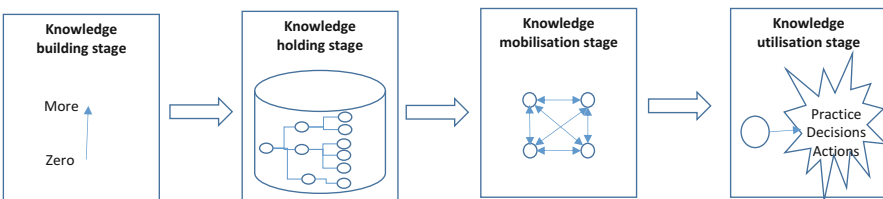
Fig. 1 The four-stage process framework for KM [1]

activities. Knowledge holding is about keeping knowledge for later utilisation. In this stage, the volume of knowledge may or may not increase; however, it is likely that knowledge will be sorted, structured, or indexed for easy retrieval. Knowledge utilisation is the last stage in a KM process where knowledge is used or may be reused.
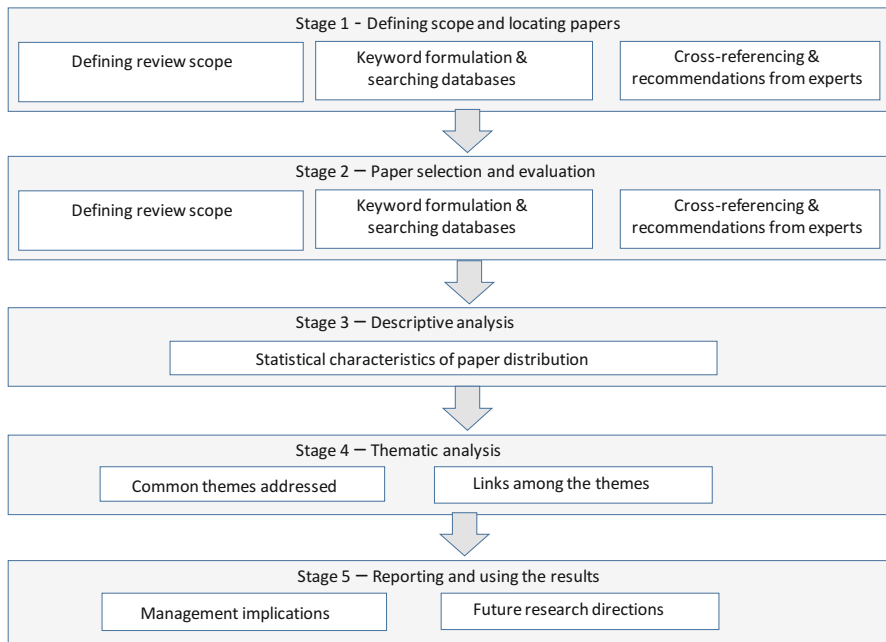
The knowledge mobilisation is a novel stage in [1] compared with previous KM process models. Previously, terms such as knowledge share, transfer, exchange, dissemination, diffusion, and flow are often used. However, Liu [1] argues that for knowledge to be effectively mobilised in organisations and value chains, especially in crossing knowledge boundary situations, significant efforts are often required from both sides involved in the knowledge activities or even third parties. To highlight the proactive efforts from both sides and third parties, knowledge mobilisation is used to represent the KM stage that close cognitive gaps between knowledge senders and receivers. In [1], a detailed discussion of knowledge mobilisation is provided. Besides the knowledge senders' willingness and eagerness of donating knowledge, knowledge receivers are required to collect and absorb the knowledge, reflect on and learn from the knowledge. Important conditions for the knowledge mobilisation to take place efficiently include trust and mutual respect between the knowledge senders and receivers. In addition, enablers such as knowledge space are also crucial. Because of this high complexity and novelty of the concept, this chapter is dedicated to knowledge mobilisation.

A number of review papers on KM are available in the literature. Majority of the reviews are on the broad KM such as KM frameworks [4], KM approaches [5], KM measurement [6], and KM life cycles [7]. A few reviews have discussed one single specific aspect that may impact on knowledge mobilisation, for example, learning organisation [8], triple loop learning [9], community of practice [10], and knowledge networks [11]. However, there is no review paper that has focused on providing a comprehensive analysis of knowledge mobilisation, especially taking a systematic literature review approach to synthesising all aspects of knowledge mobilisation in the last two decades. This chapter aims to fill in the gap by providing an overall picture of the topic and eliciting the most common themes addressed in the literature about knowledge mobilisation.

The next section defines the SLR process adapted for this study in detail. Then, Sects. 3 and 4 present descriptive analysis and thematic analysis, respectively. Finally, conclusions are drawn in Sect. 5.

2   Review Method: SLR

Systematic Literature Review (SLR) has been selected as the research method for this study because it is well suited with our aim to understand the trends of knowledge mobilisation over the last two decades and detect any gaps for future research. SLR is a structured, transparent, and valuable method that allows to integrate work from various sources to provide an overall picture of a particular

Stage 1 – Defining scope and locating papers		
Defining review scope	Keyword formulation & searching databases	Cross-referencing & recommendations from experts

Stage 2 — Paper selection and evaluation		
Defining review scope	Keyword formulation & searching databases	Cross-referencing & recommendations from experts

Stage 3 — Descriptive analysis
Statistical characteristics of paper distribution

Stage 4 — Thematic analysis	
Common themes addressed	Links among the themes

Stage 5 — Reporting and using the results	
Management implications	Future research directions

Fig. 2 Five-stage SLR methodology (adapted from [12])

topic [12]. Compared with traditional literature review, SLR is advantageous in that it reduces bias and subjectivity because in SLR criteria for paper inclusion/exclusion and for quality assessment are explicitly defined to guide the review process. In order to provide consistency, this study adapted a five-stage process originally defined by Denyer and Tranfield [13] and later used by Melacini et al. [12] in the context of supply and distribution networks. Figure 2 shows the SLR process customised for this research.

- Stage 1 defining the review scope and locating papers: keywords and search strings, databases, cross-referencing, and expert recommendations.
- Stage 2 paper selection and evaluation: paper inclusion/exclusion criteria, elimination of duplications, and paper quality assessment criteria.
- Stage 3 descriptive analysis: statistical characteristics of paper distribution in terms of publications, geographical areas, subject disciplines, research methods used, etc.
- Stage 4 thematic analysis: common themes across the papers.
- Stage 5 reporting the results: implication for management practice and recommendation for future research.

The scope of this study is a narrower area under the umbrella of knowledge management. It is the overlap among a number of topic areas: knowledge mobilisation, boundary-crossing knowledge activities, and business decision-making. In order to obtain a comprehensive collection of core contributions pertinent to the research

Table 1 Keywords and their variations defined

Keyword groups	Variations
Knowledge mobilisation	Knowledge mobilisation, knowledge share (or sharing), knowledge transfer, knowledge flow, knowledge chain, knowledge exchange, knowledge dissemination, knowledge diffusion, knowledge integration
Boundary-crossing knowledge activities	Boundary-spanning, crossing boundaries, inter-organisational, community of practice
Business decisions	Decisions, decision-making, business applications

Table 2 Selected databases and brief information of them

Database	Brief information
Business Source Complete (EBSCO)	Full-text access to more than 2800 scholarly business publications including over 900 peer-reviewed journals. Also includes book content, conference proceedings, country, industry, and market reports
Science Direct	Journals published by Elsevier with a strong focus on social, scientific, technical, and medical literature
Scopus	Journal indexing and abstracting database with citation metrics from Elsevier. It covers international research output in the fields of science, technology, medicine, social sciences, and arts and humanities (with a growing coverage of book chapters)
Web of Science	Major research database of the world's top science and technology journals and conference proceedings with some additional social sciences, arts, and humanities coverage

scope, three groups of keywords and their variants have been defined, as shown in Table 1. Boolean operators such as AND and OR are used to combine the keywords to form search strings.

In order to keep in line with the scope of the study, in the meantime to reduce bias, four scientific databases are chosen to conduct literature search: Business Source Complete (EBSCO), Science Direct, Scopus, and Web of Science. Brief information about these databases is provided in Table 2 to show the suitability of selection.
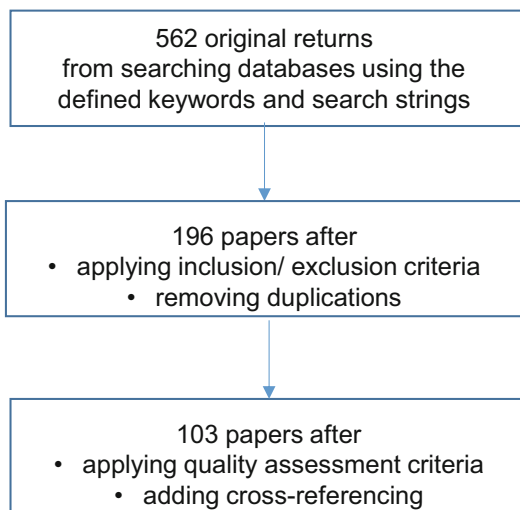
Besides database searching, cross-referencing is also used in order to include potential papers that had not been selected from the above-mentioned four databases. Furthermore, as suggested by Melacini et al. [12], papers recommended by experts are included in the analysis as well.

At the stage of paper selection and evaluation, the main purpose is to distinguish between relevant and irrelevant articles. A list of inclusion and exclusion criteria including quality assessment have been used for paper selection and evaluation, as shown in Table 3.

We first searched the databases using the search strings. Our search resulted in a preliminary return of 562 contributions. Because of the great number of returns from the search, this study decides to focus on journal articles while contributions in other types such as books, conference proceedings, and short

Table 3 Inclusion/exclusion and quality assessment criteria

Criteria	Inclusion	Exclusion
Availability	Full-text articles	Parts of the original texts (e.g., abstracts, selected sections, or bibliographical references)
Quality of articles	Articles with solid theoretical foundation, well-defined methodology, reliable data	Conceptual paper without systematic framework developed, empirical paper with insufficient or unreliable data, any paper without clear methodology
Peer review	Peer-reviewed papers	Not peer-reviewed papers
Relevance	High relevance	Low relevance
Language	English	Articles not in English

Fig. 3 The selection/evaluation process to obtain the final collection of 103 papers

562 original returns
from searching databases using the
defined keywords and search strings

196 papers after
• applying inclusion/ exclusion criteria
• removing duplications

103 papers after
• applying quality assessment criteria
• adding cross-referencing

communications were dropped. Next, through scanning of abstracts, introductions, and conclusions, we were able to implement the inclusion/exclusion criteria to distinguish between high and low relevance of the papers. To ensure the rigour of this SLR process and reduce subjective bias, each paper was scanned independently by two researchers. In particular, this study excludes papers with a mere marketing purpose and papers where "knowledge mobilisation", "boundary-crossing", and "business decision-making" were only a secondary concern. Subsequently, 196 papers remain in the process. Finally, the papers were read in their entirety, again by two researchers independently, using the quality assessment criteria. Furthermore, by cross-referencing all the citations and discussing with experts in the field, a number of potential contributions that might otherwise have been missed, a final collection of 103 papers were selected for analysis. The two-stage paper selection and evaluation process is shown in Fig. 3. The results of the analysis are presented in the following two sections, firstly descriptive analysis and then thematic analysis.

3 Descriptive Analysis and Findings

All 103 papers in the final collection were analysed in-depth to draw descriptive analysis findings according to a number of characteristics, including year of publication, journal titles, geographic distribution, methods used, and key themes addressed. Table 4 summaries the key features of each paper. These papers are organised in chronological order to show how research on knowledge mobilisation evolves over time.

As can be seen from the Table 4, the 103 articles included in the analysis are published between 1999 and 2019. If we split the 20 years into four periods, the number of publications from each period of 5 years differs significantly, as shown in Fig. 4. Period one (1999–2004) has 11 papers, period two (2005–2009) has 18 papers, period three (2010–2014) has 29 papers, and period four (2015–2019) has 45 papers. The numbers demonstrate a steady growth of publications along the years. Almost three quarters of the articles are published during the last decade (2010–2019).

In terms of publishing platforms, two journals clearly stand out. The one comes first is Journal of Knowledge Management (JKM). More than one third of the articles (i.e. 38 out of the 103) are published in JKM. This is not surprising as JKM is the earliest journal established to disseminate research in KM area. The journal has the second highest number of papers is Learning Organisation which has nine papers. Other articles are widely scattered over 50 different journals which is a good thing because it means that knowledge mobilisation is a topic that is of wide interest of journal editors and publishers. It also demonstrates the great importance of the topic.

The wide interest of the topic is also reflected in the geographic distribution of the authors who led the publications. The top three countries with the highest number of publications are the USA with 22 articles, the UK with 17 and China with 12. Figure 5 illustrates the distribution of the 103 articles according to geographic areas. Overall, Europe (45%), North America (26%), and Asia (22%) are the three big areas contributed to the research publications. Another pattern that can be observed from the Table 3 is that up to early 2000s, the authors are highly concentrated in the USA and Western Europe. In the second decade (2010–2019), the authors are more widely distributed around the world. However, the number of publications from Africa is still very low (in fact 1) compared with other areas and there is no publication from South America included in the final collection for analysis.

Another interesting aspect we have analysed is the research methods used by the articles. Among the 103 papers, there are 11 review papers and 12 conceptual papers. The remaining 82 papers are empirical studies with support from primary data. The top two data collection methods have been used for empirical research are questionnaire survey (37%) and case study (26%), followed by interview with 11%. Other methods include observation, focus group, modelling, and virtual experiment. Percentage of the methods used is shown in Fig. 6.

Table 4 Overview of key features of the final collection of papers

No.	Refs.	Journal	Country	Form of k. mobilisation	Method used	Themes addressed A	B	C	D
1.	[14]	Journal of Knowledge Management	USA	k. diffusion	Citation analysis				x
2.	[15]	Academy of Management Review	USA	Organisational learning	Conceptual	x	x		
3.	[16]	Journal of Knowledge Management	Belgium	Organisational learning	Conceptual				x
4.	[17]	Expert Systems Research and Applications	USA	Lessons learned	System review			x	
5.	[18]	Organization Science	USA	k. integration	Observation	x	x		
6.	[19]	Journal of Leadership and Organization Studies	USA	k. sharing	Case study		x		
7.	[20]	Organization Science	USA	Community sharing	Observation, interview	x	x		
8.	[21]	Organization Science	USA	k. transfer, translation, and transformation	Case study	x	x		x
9.	[22]	Management Science	USA	k. transfer	Questionnaire survey	x	x		
10.	[23]	Journal of Knowledge Management	Korea	KM	Questionnaire survey	x		x	
11.	[24]	Journal of Knowledge Management	UK	KM	Conceptual	x			
12.	[25]	Academy of Management Journal	USA	k. sharing	Questionnaire survey		x		
13.	[26]	European Journal of Innovation Management	Finland	k. sharing	Conceptual	x			
14.	[27]	MIS Quarterly	USA	k. boundaries	Case study	x			
15.	[28]	Journal of Knowledge Management	USA	Sharing best practice	Case study	x	x		
16.	[29]	IEEE Transactions on Engineering Management	USA	k. integration	Questionnaire survey		x		x
17.	[30]	Journal of Management Information Systems	USA	KM	Case study	x			
18.	[31]	The Learning Organization	Netherlands	k. sharing	Questionnaire survey	x			x
19.	[32]	The Learning Organization	Spain	Learning	Questionnaire survey		x		x
20.	[8]	The Learning Organization	Australia	Learning	Literature review	x			
21.	[33]	Journal of Knowledge Management	Bahrain	k. sharing	Survey, interview	x	x		
22.	[34]	Journal of Information Sciences	China	k. sharing	Questionnaire survey	x	x		
23.	[35]	Journal of Knowledge Management	France	k. transfer	Case study	x			x
24.	[36]	Tourism Management				x	x		

No.	Ref	Journal	Country	Topic	Method				
25.	[37]	Journal of Knowledge Management	Lebanon	k. transformation	Conceptual		x		
26.	[38]	Strategic Management Journal	USA	k. transfer	Questionnaire survey	x			x
27.	[39]	Journal of International Business Studies	Netherlands	k. sharing	Questionnaire survey				x
28.	[4]	Journal of Knowledge Management	UK	KM frameworks	Literature review	x	x		
29.	[40]	International Journal of Information Management	China	k. sharing	Questionnaire survey		x		
30.	[41]	Journal of Knowledge Management	Canada	KM	Literature review	x			
31.	[42]	Journal of Knowledge Management	USA	k. sharing	Questionnaire survey	x			
32.	[43]	R and D Management	Ireland	k. flow	Case study			x	
33.	[44]	Academy of Management Review	USA	Organisational learning	Conceptual	x	x		
34.	[45]	Journal of Knowledge Management	Korea	Community of practice	Questionnaire survey		x		
35.	[46]	Journal of Knowledge Management	Norway	k. communities	Questionnaire survey	x	x		x
36.	[47]	Journal of Knowledge Management	Spain	Organisational learning	Questionnaire survey	x			
37.	[48]	Journal of Knowledge Management	UK	k. networking	Case study	x			
38.	[49]	Systems Research and Behavioural Science	China	k. transfer	Virtual experiment		x		
39.	[9]	Management Learning	UK	Triple loop learning	Literature review	x	x		
40.	[50]	Knowledge and Process Management	Netherlands	k. sharing	Case study		x		
41.	[51]	Journal of Knowledge Management	Australia	k. sharing	Questionnaire survey	x			
42.	[52]	Journal of Knowledge Management	Germany	k. ecology	Conceptual		x		
43.	[53]	Management Decision	Spain	k. boundaries	Conceptual	x	x		
44.	[54]	Decision Support Systems	China	k. transfer	Questionnaire survey	x	x	x	x
45.	[55]	Journal of Management	France	k. networks	Literature review		x		
46.	[56]	The Learning Organization	USA	k. sharing	Questionnaire survey	x	x		
47.	[57]	Project Management Journal	Finland	k. networks	Conceptual	x	x		x
48.	[58]	International Journal of Production Research	UK	k. networks	Conceptual		x		
49.	[59]	Advances in Developing Human Resources	USA	Learning organisation	Case study	x	x		
50.	[60]	Journal of Knowledge Management	France	k. transfer	Simulation			x	

Table 4 (continued)

No.	Refs.	Journal	Country	Form of k. mobilisation	Method used	Themes addressed			
						A	B	C	D
51.	[61]	Managing Service Quality: an International Journal	UK	k. dissemination	Interview	x			
52.	[62]	International Journal of Production Research	UK	k. chain	Case study				x
53.	[6]	Journal of Knowledge Management	Ireland	k. measurement	Literaturereview		x		
54.	[63]	Journal of Decision Systems	UK	k. networks	Modelling		x	x	
55.	[64]	Journal of Knowledge Management	Korea	k. flow	Case study	x			x
56.	[65]	Production Planning and Control	UK	k. chain	Case study		x		x
57.	[66]	Journal of Knowledge Management	India	k. flow	Literature review	x			
58.	[67]	Journal of Knowledge Management	UK	k. mobilisation	Case study			x	
59.	[68]	Electronic Journal of Knowledge Management	Canada	k. sharing	Questionnaire survey	x	x		
60.	[69]	Journal of Enterprise Information Management	Malaysia	k. integration	Questionnaire survey		x		
61.	[70]	Journal of Knowledge Management	France	k. transfer	Literature review		x		
62.	[71]	The Learning Organization	Hungary	Learning and k. transfer	Interview			x	
63.	[72]	The Learning Organization	USA	Organisational learning	Questionnaire survey		x		x
64.	[10]	Journal of Knowledge Management	Saudi Arabia	Community of practice	Literaturereview	x	x		
65.	[73]	Action Learning: Research and Practice	Ireland	Organisational learning	conceptual	x			x
66.	[74]	Journal of Business Research	UK	Knowledge mobilisation	Interview		x	x	
67.	[75]	Journal of Knowledge Management	Finland	Community of practice	Case study		x	x	x
68.	[76]	Journal of Knowledge Management	Netherlands	k. sharing	Questionnaire survey	x			
69.	[77]	Journal of Knowledge Management	Oman	k. sharing	Interview		x		x
70.	[7]	Electronic Journal of Knowledge Management	South Africa	KM life cycle	Literature review				
71.	[78]	Research Policy	UK	k. networks	Questionnaire survey		x		x
72.	[79]	Knowledge Management Research and Practice	China	k. sharing	Case study	x			x

#	Ref	Journal	Country	Topic	Method					
73.	[80]	International Journal of Decision Support System Technology	UK	k. mobilisation	Case study			x		x
73.	[80]	International Journal of Decision Support System Technology	UK	k. mobilisation	Case study			x		x
74.	[81]	Journal of Knowledge Management	Italy	k. integration	Questionnaire survey	x				x
75.	[82]	Journal of Knowledge Management	Canada	Lessons learnt	Interview	x	x	x		x
76.	[83]	Journal of Knowledge Management	China	k. protection	Questionnaire survey	x				
77.	[84]	Enterprise Information Systems	USA	k. sharing	Questionnaire survey	x	x	x	x	
78.	[85]	International Journal of Project Management	UK	Triple loop learning	Questionnaire survey				x	x
79.	[86]	Journal of Knowledge Management	New Zealand	KM	modelling				x	
80.	[87]	Journal of Knowledge Management	China	KM	Case study, interview			x	x	x
81.	[88]	Journal of Enterprise Information Management	China	k. sharing	Questionnaire survey	x		x	x	x
82.	[89]	Journal of Knowledge Management	UK	KM	Case study			x	x	x
83.	[90]	Journal of Product Innovation Management	China	k. transfer	Questionnaire survey	x				x
84.	[91]	Benchmarking: An International Journal	India	k. flow	Questionnaire survey			x	x	x
85.	[92]	Journal of Decision systems	UK	k. mobilisation	modelling		x	x	x	
86.	[93]	The Learning Organization	Norway	k. sharing	Interview		x	x	x	
87.	[94]	The Learning Organization	Norway	Triple loop learning	Conceptual	x	x			
88.	[95]	The Learning Organization	USA	Learning organisation	Interview	x	x	x		
89.	[96]	Journal of Knowledge Management	Hungary	k. sharing	Questionnaire survey	x	x			
90.	[97]	Journal of Organizational Change Management	Indonesia	k. sharing	Questionnaire survey	x				x
91.	[98]	Journal of Knowledge Management	USA	k. sharing	Questionnaire survey		x			x
92.	[99]	Technological Forecasting and Social Change	Italy	k. flow	Questionnaire survey				x	
93.	[100]	Journal of Knowledge Management	Iran	k. sharing	Questionnaire survey		x			
94.	[11]	Journal of Business Research	China	k. integration	Questionnaire survey		x			
95.	[101]	International Journal of Operations and Production Management	Netherlands	k. flow	Case study	x	x			x

(continued)

Table 4 (continued)

No.	Refs.	Journal	Country	Form of k. mobilisation	Method used	Themes addressed			
						A	B	C	D
96.	[102]	Computers in Industry	UK	k. chain	Case study		x	x	x
97.	[103]	Production Planning and Control	UK	k. sharing	Interview	x	x	x	x
98.	[104]	Benchmarking: An International Journal	UAE	Organisational learning	Questionnaire survey	x		x	
99.	[105]	Journal of Knowledge Management	Korea	organisational learning	Questionnaire survey		x		x
100.	[106]	Journal of Business Research	UK	k. sharing	Questionnaire survey	x	x		x
101.	[107]	Advanced Engineering Informatics	China	k. sharing	Case study		x		x
102.	[108]	Information and Management	USA	k. dissemination	Focus group		x	x	
103..	[109]	International Journal of Production Economics	Romania	k. dissemination	Case study		x		x

Note: Theme A—Knowledge boundary types, Theme B—Boundary-spanning mechanisms, Theme C—Advanced ICT technologies facilitating knowledge mobilisation, Theme D—Business decision applications
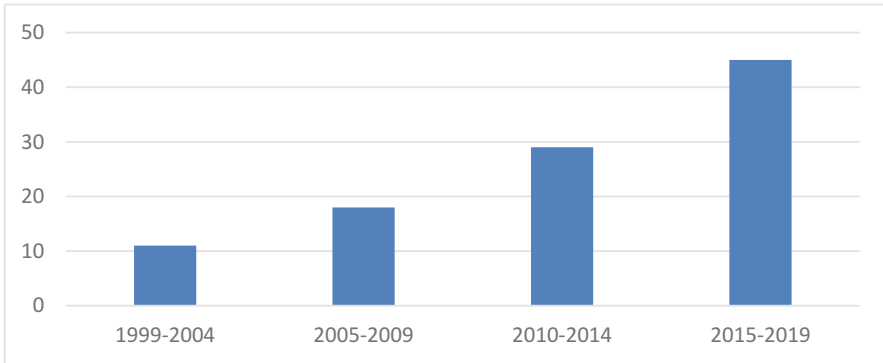
Fig. 4 Growing number of publications by time period
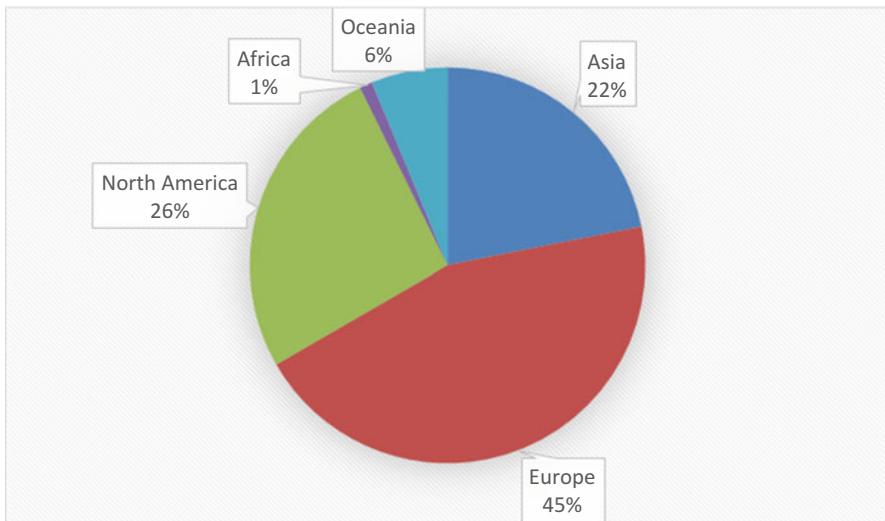
Fig. 5 Geographic distribution of the articles

4 Thematic Analysis and Findings

On the far right hand side of Table 4, key themes emerged from the SLR process are presented. Links between each of the paper and relevant themes are marked with "x", representing evidence of the theme from the particular paper. The four key themes are:

- Theme a: boundary types that might erect barriers to knowledge mobilisation
- Theme b: boundary-spanning mechanisms
- Theme c: ICT technologies facilitating knowledge mobilisation crossing boundaries
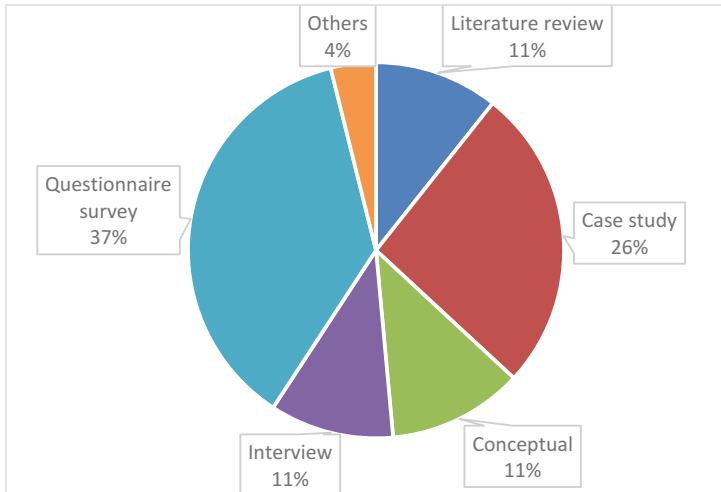
Fig. 6 Research methods used

- Theme d: Business application areas where knowledge mobilisation issues are addressed

4.1 Theme A: Knowledge Boundaries

In general, a boundary is a demarcation that makes the limit of an area or a border that divides groups. Many types of boundaries exist in reality that could erect barriers to knowledge mobilisation, such as cultural, geographic, social, organisational, activity, and resource boundaries [1].

Organisational culture is one of the most common boundaries identified in the literature for knowledge mobilisation [47, 79, 83, 84, 88, 97, 104]. Culture is a very complex type of boundary which could consist of many different factors, such as interpersonal trust [31, 42, 56, 76], commitment from staff [51], rewards and resistance [95].

Organisation structure also plays an important role in defining the relationships between staff, such as knowledge provider reputation and recipient reputation [28]. These factors in turn provide possibilities of generating obstacles to knowledge sharing [66], let alone privacy concerns crossing country borders [35]. Lack of resources such as insufficient time and money often hinder knowledge movement and learning activities [51, 95]. In many organisations, lack of leadership [65, 69, 88, 95] and top management support [83] are critical failure factors to knowledge mobilisation initiatives and programmes.

Power boundary or political boundary or pragmatic boundary has been recognised as a boundary that is very difficult to cross [93, 94]. This type of boundary

occurs when people have very different interests in the business and knowledge activities, ultimately resulting in conflicts among the participating actors and bodies. In order to resolve the conflicts, different actors and bodies need to be willing and prepared to negotiate and compromise. Otherwise, common interests cannot be reached and knowledge mobilisation is hardly possible [18, 21].

Syntactic and semantic boundaries are usually discussed together. Syntactic boundary is considered relatively easy to cross because people involved share a common logic, a set of values and worldview [18, 53]. For example, a common lexicon can be developed for knowledge transfer crossing a syntactic boundary. This is especially the case in most traditional technology-based knowledge systems where explicit knowledge is mobilised. Comparatively, semantic boundary is where people have different understanding and interpretation of the same knowledge. It is important that people can develop an understanding of and sensitivity to other people's understandings and interpretations if semantic boundary is to be crossed [53]. The emphasis is usually put on knowledge translation and the development of common meanings to address interpretive differences [1].

To understand the key characteristics of these different types of knowledge boundaries is the foundation to develop appropriate mechanisms to successfully cross the boundaries, which is the focus of the next theme.

4.2   Theme B: Boundary-Crossing Mechanisms

A great number of mechanisms have been discussed in literature to cross various types of knowledge boundaries. These mechanisms can be classified into four main categories: boundary objects such as knowledge networks, boundary spanners such as knowledge brokers, boundary practice, and knowledge motivation systems [1, 53, 84].

Boundary objects are the most fundamental boundary-spanning mechanisms that refer to physical, abstract, or mental entities and artefacts enabling knowledge mobilisation [26, 53]. Knowledge networks are among the most widely used boundary objects consisting of knowledge nodes and relationships among the knowledge nodes. The relationships are the linkages among the nodes, representing not only knowledge combination possibilities and capabilities but also knowledge flow channels through which knowledge diffuses and flows [1]. Knowledge networks can be in the form of social networks [11, 25, 52, 60, 64, 77, 78, 100, 108] or technology networks [57, 74, 95, 107]. A clear advantage of using knowledge networks is social interaction and social learning [39, 40]. A typical example of such social learning is the popular concept of community of practice [45, 50, 61, 75]. To develop successful knowledge networks, knowledge taxonomy and ontology play a key role in terms of their implementation [6].

A second boundary-spanning mechanism highlighted in literature is boundary spanners [18, 53]. They are human agents who frame and translate knowledge from one domain to another in an effort to promote knowledge mobilisation. Human

agents are good at using languages to articulate and using their cognitive power to enable the movement of knowledge; hence, this mechanism is believed to be effective in mobilising both explicit and tacit knowledge. Research also indicates that the position or standing of human agents in a knowledge network is an important factor to impact on the effectiveness of knowledge mobilisation [1]. There have been many different types of human agents all playing the boundary spanners' role, including gatekeeper, knowledge brokers [43, 70, 96], knowledge mentors and taxonomists [67].

By boundary practice it means that human agents engage in collective activities and learn from each other in order to overcome barriers to knowledge mobilisation, in simple words, learning by doing things together [53]. Because of the social learning effect, the outcome from boundary practice is not just sharing knowledge, but also improving existing knowledge and generating new knowledge [1]. Compared with boundary objects and boundary spanners, boundary practice particularly suits for the mobilisation of tacit knowledge. Boundary practice is also a relatively new concept, which provides a direction for future research.

The fourth category of boundary-spanning mechanism commonly acknowledged in literature is motivation systems, for example, organisational reward systems [19], incentives [84], motivational factors such as reciprocal benefits, knowledge self-efficacy, and enjoyment in helping others. Research finds that these factors were significantly associated with employee's knowledge sharing attitudes and intentions [34].

The above boundary-spanning mechanisms were mostly explored in an isolated manner at the early stages when these mechanisms were proposed. However, more recent publications advocate for the combinatory use of the mechanisms for better effectiveness of knowledge mobilisation activities [1, 84]. Even though these mechanisms sufficiently distinct from each other, they are actually mutually interdependent. It can be considered that the four types of boundary-spanning mechanisms provide four complementary perspectives of a knowledge mobilisation process. Boundary spanners provide an actor perspective, that is, "who" is making the knowledge mobilisation activities happen. Boundary objects represent the artefact perspective, that is, what boundary spanners need to use to mobilise knowledge. Thirdly, boundary practice provides an activity perspective, that is, by doing what. Finally, motivation systems provide a reward perspective, that is, why do people want to mobilise knowledge. If only people's effort and investment in knowledge mobilisation is rewarded, can the knowledge activities be maintained over time, which may develop into a culture that can foster knowledge mobilisation and learning long term [1].

4.3 Theme C: Advanced ICT Technologies Facilitating Knowledge Mobilisation

There is no doubt that ICT technologies have been playing a crucial role in removing boundaries for communication and knowledge activities, hence have been considered as an enabler for knowledge mobilisation. There has been a massive amount of literature which has already discussed in great detail of ICT support for knowledge management and learning in general [63, 75, 84, 85, 104]. This section will focus on three state-of-the-art ICT technologies and examine how they facilitate knowledge mobilisation. These are Internet of Things (IoT), Big Data Analytics (BDA), and enterprise systems.

IoT refers to an emerging paradigm consisting of a continuum of uniquely addressable objects communicating with each other to form a worldwide dynamic network [1]. IoT is rapidly gaining momentum, bringing millions of devices and objects into a connected world. This interconnected network uses disruptive digital technologies to influence business daily operations as well as long-term strategies, in order to increase the technologies' efficiency and innovativeness in the current knowledge economy [89]. Literature has concluded that IoT has three clear orientations. Firstly, IoT is things-oriented, which focus on the "objects" and on finding a paradigm that is able to identify and integrate the objects. Secondly, IoT is internet-oriented, of which the focus is on the networking paradigm and on the exploitation of internet protocols to establish an efficient connection between the objects. Thirdly, IoT is semantic-oriented, aiming to use semantic technologies describing objects and to manage a massive amount of data provided by the increasing number of objects [1, 43, 99]. The adoption of IoT technologies is accelerating benefited from a number of technological factors, including fast decline in the costs of objects such as sensors and actuators, an increasing ability of connecting the sensors and actuators, and the ability to analyse huge amount of data, for example, by using Big Data Analytics [89].

Big Data is one of most popular terms in today's knowledge economy. The capture and analysis of Big Data can generate new knowledge and business intelligence which has great value in supporting business decision-making. Big Data is typically represented by 5Vs: volume, variety, velocity, veracity, and value [87]. Volume refers to the enormous size of the data. Variety means that data exist in various forms, mostly in not structured and usable way. Velocity indicates the huge pace data are generated and flow, which could be well beyond the analytical capabilities of most traditional database software tools. Veracity refers to the fact that data may contain noise, be incomplete or out of date, which could affect the quality and usefulness of the data. Value extracted from hidden data is a source of competitive advantage. Value is often linked to an organisation's ability to make better business decisions [1]. It is widely accepted that the real business value of Big Data is not in the data themselves but rather in the knowledge discovered through Big Data Analytics (BDA). BDA is a complex, multi-stage process, consisting of data acquisition, information extraction and cleansing, data integration, modelling and analysis, and interpretation and deployment [86]. One of the biggest challenges

identified in BDA is a lack of vision, which usually leads to data being collected but not analysed, hence researchers have recommended that organisations should put business objectives in the centre of Big Data activities and programmes [86, 87].

Lastly, enterprise systems such as ERP systems have been playing a key role for the mobilisation of explicit knowledge all the time [69]. Enterprise systems integrate data across departments and functional work units through a unified software programme structured around an organisation-wide database, which is a great way to facilitate knowledge mobilisation [108]. In comparison with traditional enterprise systems such as MIS (Management Information Systems), the major difference of ERP lies in its power to provide integrated and streamlined internal information to synergise work in the supply chain for businesses to create new competitive advantages [54]. For example, Sasidharan [108] investigated the incorporation of domain expertise of knowledge sources and knowledge flow intensity by reconceptualising knowledge networks in the implementation of ERP systems. Based on evidence from empirical data collected from UK industries, Jayawickrama et al. [103] found that ERP systems have positive impact on knowledge transfer and retention of knowledge.

4.4   Theme D: Business Decision Applications

Literature has discussed the application of knowledge mobilisation to support business decision-making in all major industries and sectors. They range from semiconductor industry [14] to automotive industry [75, 79, 101], from public sector [93] such as education [97] to parking service in transportation [89], from healthcare [73] to pharmaceutical companies [22], and from oil and gas industry [87] to agri-food industry [80]. Knowledge mobilisation in project management also attracted a lot of attention [48, 57, 82, 85].

Among the collection of 103 articles analysed, manufacturing is one of the most researched industry. Literature not only discusses knowledge mobilisation and its support for business decisions in general manufacturing [16, 98], but also in international manufacturing MNCs [39, 81, 109] and manufacturing supply chains [65, 91]. In close association with manufacturing, there have been great amount of literature exploring the mobilisation of knowledge for design decisions [57, 107], for new product development decisions [25], for R&D decisions [38, 79, 90], and for innovation decisions [26].

5   Conclusions

This chapter provides a comprehensive analysis of over a hundred of publications on knowledge mobilisation over two decades, that is, from 1999 to 2019. A systematic literature review comprising five standardised stages is employed. Key contributions

of the chapter lie in three aspects. Firstly, this is the first systematic review on the topic of knowledge mobilisation, even though review on general knowledge management has been existent. Secondly, the descriptive analysis findings revealed a number of trends in terms of articles' publication year, publishing platforms (journals), geographic distribution of the publications and research methods used. Thirdly, the thematic analysis discovered four main themes: types of knowledge boundaries, boundary-spanning mechanisms, advanced ICT technologies facilitating knowledge mobilisation, and the main application areas. These findings provide insights into future research directions and potential management implications in terms of mobilising knowledge to achieve better business decisions.

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