Public sector knowledge management: a structured literature review

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Abstract

Purpose – *This paper aims to review and critique the public sector knowledge management (KM) literature, offers an overview of the state of public sector KM research and outlines a future research agenda.*

Design/methodology/approach – *Articles published in KM journals are analyzed using a structured literature review methodology. The paper analyzes 180 papers published within ten journals specializing in the field of KM.*

Findings – *Public sector KM is a research area of growing importance. Findings show that few authors specialize in the field and there are several obstacles to developing a cohesive body of literature. Low levels of international cooperation among authors and international comparisons mean that the literature is fragmented. Some research topics and some geographical areas within the public sector theme are over-analyzed, while others are under-investigated. Additionally, academic researchers should re-think their methodological approach if they wish to make significant contributions to the literature and work toward developing research which impacts practice in conjunction with practitioners.*

Originality/value – *The paper presents a comprehensive structured literature review of the articles published in KM journals. The paper's findings can offer insights into future research needs.*

Keywords *Public sector, Knowledge management, Structured literature review*

Paper type *Literature review*

1. Knowledge management in the public sector

Within knowledge management (KM), the public sector is an important and specific research context. According to Edge (2005, p. 45), KM "has the potential to influence greatly and improve the public sector renewal processes". Indeed, within the public sector, KM "is a powerful enabler in the current drive for increased efficiency in all areas" (Mcadam and Reid, 2000, p. 328). However, Edge (2005, p. 45) argues that developing a KM culture within the public sector is more challenging than in the private sector. Amayah (2013, p. 456) supports this argument outlining "organizational goals in public organizations are typically more difficult to measure and more conflicting than in private organizations, and they are affected differently by political influences". Additionally, the public sector has specific labor divisions that are a disincentive for knowledge sharing and "this situation makes knowledge delivery in the public sector more difficult than that in the private sector" (Gau, 2011, p. 2). Therefore, studying public sector KM requires a separate research agenda.

A separate research agenda is further justified because the public sector is organizationally specific, has different effectiveness concerns and has different levels of representativeness, accountability, and responsiveness. First, KM is organizationally specific. As Jones and Mahon (2012, p. 774) exemplify "in a military environment knowledge is sometimes needed in more mission-critical situations like a battlefield, where real-time decisions can have life or death consequences and where knowledge delivered late is useless". Similarly, in the law enforcement context KM "is not a linear sequence of

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actions but a more complex process, which involves mental and physical aspects of the investigator" (Nordin *et al.*, 2009, p. 9). Therefore, public sector KM presents specific challenges due to specific organizational characteristics.

Second, the effectiveness of some private organizations inextricably links with the public sector. For example, universities and research centers are mainly public bodies in many countries. However, "the degree of impact of university activities on industrial innovation and the nature of the linkage used depend on the industry concerned, as well as the provision of appropriate policy for knowledge transfer" (Gertner *et al.*, 2011, p. 626). Therefore, it is important to understand how public sector KM impacts on the private sector. Third, as Jain and Jeppesen (2013, p. 347) outline, "it is often argued that public sector organizations face greater pressures for representativeness, accountability and responsiveness than private sector firms". Additionally, as De Angelis (2013, p. 1) state, the public sector is influenced by a growing need for: "competition, performance standards, monitoring, measurement, flexibility, emphasis on results, customer focus and social control".

Accordingly, public sector organizations should not import KM tools and models from private companies that have been developed without consideration of the public sector context (UNPAN, 2003, p. 1). Public sector practitioners must recognize that their organizations work in a unique context in which their stakeholders and accountability differ significantly from those of the private sector – blindly applying private sector KM tools and models may be counterproductive.

However, there are fewer studies focusing on public sector KM than those focusing on KM in the private sector (Oluikpe, 2012, p. 875; Ringel-Bickelmaier and Ringel, 2010, p. 524), even though "KM initiatives have always been integrated in government tasks, inseparable from strategy, planning, consultation, and implementation" (Riege and Lindsay, 2006, p. 24). Therefore, there is a need to understand how KM is evolving within the context of public organizations. Accordingly, this paper reviews and critiques public sector KM literature, offers an overview of the state of public sector KM research and outlines a future research agenda.

This paper is novel because it uses a structured literature review methodology as developed by Guthrie *et al.* (2012, p. 70), Dumay (2014) and Dumay and Cai (2014). The main advantage of structured literature reviews is their empirical grounding, avoiding criticism that seminal articles may be missed and eliminating most researcher bias (Dixon-Woods, 2011, p. 332; Tranfield *et al.*, 2003, p. 209). The results and implications should inform practitioners and academics about the main evolution of public sector KM and future research needs. In keeping with the structured literature review methodology, the research answers three core research questions:

RQ1. How is the KM literature within the public sector developing?

RQ2. What is the focus of the KM literature within the public sector?

RQ3. What is the future of KM research within the public sector?

The results of the study show the increasing importance of public sector KM as identified by the growing number of papers published and identify several key issues. First, there is low specialization because few authors write extensively about the public sector and there are a limited number of practitioner authors. This makes for a lack of a cohesive literature, as evidenced by low citation rates. Second, some journals publish more public sector KM articles and have more citations compared to other journals and therefore could be interesting publication outlets. Third, low levels of international cooperation among authors and international comparisons contribute to the fragmentation of the literature. Fourth, some research topics and some geographical areas within the public sector theme are over-analyzed and others are under-investigated. Fifth, researchers should re-think methodological approaches for making significant contributions to the literature to develop more critical approaches.

To present the structured literature review, this paper has four further sections. First, Section 2 presents the structured literature review methodology. Next, Section 3 presents the results and Section 4 critiques the results by offering implications of the findings. Finally, Section 5 presents a conclusion offering a future research agenda and the research limitations.

2. The structured literature review methodology

According to Petticrew and Roberts (2008, Kindle Edition: Location 98-106) "literature reviews have many purposes". Some of them are to examine old theories, to provide a basis for interventions, provide guidance to researchers planning future studies and to provide summaries on a particular issue. The different purposes and growing complexity of literature reviews due to the increasing number of publication and research methods means that there are several approaches to developing literature reviews. According to Arksey and O'Malley (2005, p. 20), the "rapid growth in undertaking reviews of the literature has resulted in a plethora of terminology to describe approaches that, despite their different names, share certain essential characteristics, namely, collecting, evaluating and presenting the available research evidence". Some labels in current usage are systematic review, meta-analysis, rapid review, (traditional) literature review, narrative review, research synthesis and structured review. As Arksey and O'Malley (2005, p. 20) state, "greater clarity regarding the terminology and methods that surround literature reviews will assist researchers in identifying when and how such reviews might be undertaken". Therefore, this section aims to depict the method used to develop the literature review.

Primarily, the structured literature review methodology in this research derives from previous studies (Dumay and Cai, 2014; Dumay, 2014; Guthrie *et al.*, 2012). Following these studies, the research follows six steps.

1. Define the research questions.
2. Write a research protocol for the review.
3. Determine the articles to include and carry out a comprehensive literature search.
4. Develop a coding framework.

"The public sector KM literature is fragmented, dominated by unrelated research mainly in the education and research sectors, with a distinctly Malaysian and Indian focus, supported by ostensive research methodologies."

> **"The domination of education and research highlights that many KM researchers are more comfortable researching what they know, rather than exploring the boundaries of other public sector organizations."**

5. Code the articles and ensure reliability.
6. Critically analyze and discuss the results.

Having already outlined the research questions; the following sub-sections describe each step.

2.1 Research protocol

According to Petticrew and Roberts (2008, Kindle Edition: Location 3,335-3341), "it is essential to write a protocol stating the review question, the methods to be used the study types and designs which the reviewer intends to locate, and by what means, and how these studies will be appraised and synthesized". Following these suggestions, a written protocol was developed that describes the source of information, supporting tools and the primary information sought from the papers.

First a manual coding procedure indicating information to retrieve from each paper was developed. Manual coding has advantages compared to computer-aided coding because when "words with similar meaning such as 'human capital' and 'employees' are encountered, they can be understood in their true sense and coded accordingly" (Guthrie *et al.*, 2012, p. 71). Additionally, as suggested by Bazeley and Jackson (2013, p. 2), using "a computer is not intended to supplant time-honored ways of learning from data, but to increase the effectiveness and efficiency of such learning". Therefore, authors manually code papers using software capable of analyzing unstructured data because computers can support the coding process, improve research pace and reduce subjectivity. For this reason, "NVivo 10" (QSR International Pty Ltd, 2014) software is used to develop the analysis.

Essentially a structured literature review is a form of content analysis whereby the unit of analysis is the article, as opposed to words, sentences or paragraphs, as is commonly found in content analysis research (Krippendorff, 2013, p. 9). Additionally, to reduce subjectivity and the risk of coding bias, Krippendorff's alpha inter-coder reliability test (Hayes and Krippendorff, 2007, p. 82) using the software "R" (R Core Team, 2014) and the library "irr" (Gamer *et al.*, 2012) is conducted.

2.2 Literature search

To identify articles relevant to the literature review, the ten most important KM journals according to Serenko and Bontis (2013, p. 310) are used. As Serenko and Bontis (2013, p. 309) outline, "a key assumption is that there exist a strong positive relationship between the number of citations attracted by a journal and its overall quality". Accordingly, two research assistants identified the relevant articles. They read 3,900 abstracts, titles and keywords of papers published in the selected journals. Additionally, keyword queries using the Scopus database[1] as a control procedure checked for articles missed during the manual search. From this research, an initial group of 255 relevant articles were selected. From these articles, final group of 180 papers is used (see Appendix). Some relevant articles may have been involuntarily ignored, but considering the number of papers selected, the selection is a comprehensive and representative sample of the public sector KM literature.

2.3 Develop a coding framework

The coding framework is based on similar research frameworks developed by Broadbent and Guthrie (2008), Guthrie *et al.* (2012) and Dumay and Garanina (2013). The aim was to "adopt a formal, systematic approach to extracting relevant information from primary studies" (Petticrew and Roberts, 2008, Kindle Edition: Location 3,346-3352). As a result, seven categories for coding the articles were developed (Table I).

The first category classifies articles for their journal attributes and citation counts. The primary aim was to analyze the literature's evolution and its impact. The metrics citation index (CI)[2] and the citations per year (CPY)[3] are used to measure article, author and journal impact, based on the approach developed by Dumay (2014). In that research, Google Scholar data are used based on queries developed using Harzing's (2007) *Publish or Perish* software.

The second category is government jurisdiction. In general terms, government jurisdictions are nation-specific, while public organizations (e.g. universities and hospitals) are comparable among countries. Additionally, as Broadbent and Guthrie (2008, p. 143) stated, "given that the research is mainly contextual, organizations provide the bulk of research sites because of their availability and ease of access". Therefore, by analyzing government jurisdictions, the aim is to understand patterns of publication and if there are under-investigated jurisdictions due to differences in national contexts and data accessibility. To develop the list of attributes, the original list developed by Broadbent and Guthrie (2008, p. 140) is adapted.

The third category is the public service provided. Differences in access to specific organizations could lead to the development of more papers on some public services. Therefore, to identify possible under-investigated areas, main public services are grouped into eight attributes being "health", "education and research centres", "defense", "police and safety services", "welfare", "infrastructure, energy, water and related", "finance and related services" and "other".

The fourth category is location. As Serenko *et al.* (2010, p. 18) state, KM "may potentially offer a competitive advantage and help develop knowledge-intensive economies". Therefore, by analyzing countries, the aim is to understand how literature supports the development of a scientific dialogue within specific national contexts that supports the development of knowledge-intensive economies. Therefore, articles are first grouped by continent and as proposed by Guthrie *et al.* (2012, p. 71), the UK is separated from Continental Europe, while the American continent is divided into "North", "Central" and "South".

The fifth category is the research method used. Management research is still struggling to reach an epistemological consensus among authors (Tranfield *et al.*, 2003, p. 212). Different approaches lead to the development of multiple research methods. Based on previous studies (Broadbent and Guthrie, 2008; Dumay, 2014; Guthrie *et al.*, 2012), a list of 11 different research methods was made: "quantitative cross-sectional", "case study", "literature review – normative", "action research", "other qualitative", "viewpoint", "mixed methods", "interviews", "modeling tools", "quantitative longitudinal" and "other." As recognized previously (Broadbent and Guthrie, 2008, p. 141; Dumay, 2014, p. 4), classifying research methods is problematic due to articles using multiple methods because different methods are combined to develop methodological reliability (e.g. interviews in case studies). To address the classification problem, the search looks for the classification proposed by the publisher and the method(ology) declared by the authors.

The sixth category is the framework-model because using "existing or proposing new frameworks and models helps to understand whether a discipline is maturing" (Dumay and Serenko, 2015). The literature suggests that public organizations should not adopt frameworks and methods developed in the private sector (UNPAN, 2003, p. 3). Therefore, analyzing the framework-model used, it is possible to understand if literature is developing

Table I Research framework and main results

Category	*Variables*	*Results*		*Krippendorff's alpha*
Journals, authors, year	Journals	10		1.000
	Authors	399		1.000
	Institution	330		1.000
	Years	2002-2014		1.000
Government jurisdiction	Super-national (e.g. E.U.)	2	2%	
	National government	28	15%	
	State-regional	3	2%	
	Local government	12	7%	
	Public business enterprise	6	3%	
	Public service entity	119	66%	
	Other	10	6%	
	Total	*180*	*100%*	*0.903*
Public service	Health	27	15%	
	Education and research centers	96	53%	
	Defense	5	3%	
	Police and safety services	9	5%	
	Welfare	1	1%	
	Infrastructure	5	3%	
	Energy, water and correlated	2	1%	
	Finance and related services	5	3%	
	Other	30	17%	
	Total	*180*	*100%*	*0.875*
Location	Europe	29	16%	
	UK	18	10%	
	Australia	12	7%	
	Asia	49	27%	
	North America	28	16%	
	South America	3	2%	
	Central America	0	0%	
	Caribbean	2	1%	
	Africa	4	2%	
	International	15	8%	
	Other	20	11%	
	Total	*180*	*100%*	*0.980*
Research method	Quantitative cross-sectional	50	28%	
	Case study	41	23%	
	Literature review–normative	21	12%	
	Action research	19	11%	
	Other qualitative	15	8%	
	Viewpoint	14	8%	
	Mixed methods	12	7%	
	Interviews	7	4%	
	Modeling tools	1	1%	
	Other	0	0%	
	Total	*180*	*100%*	*0.900*
Framework	No framework-model used	26	14%	
	Applies or considers previous framework-model	112	62%	
	Proposes a new framework-model	42	23%	
	Total	*180*	*100%*	*0.873*
Theme	Communities of practice	8	4%	
	Information technology	23	13%	
	KM strategy	27	15%%	
	Knowledge innovation	19	11%	
	Management elements and process	65	36%	
	Personal and organizational learning	18	10%	
	Organizational culture	13	7%	
	Scientometrics	0	0%	
	Other	7	4%	
	Total	*180*	*100%*	*0.911*

specific models for the public sector or is copying existing models developed in the private sector. The classification for this category is derived from Dumay and Serenko (2015).

The seventh category is research theme. By analyzing article themes, it is possible to point out specific areas that may be of interest to other scholars, finding new research opportunities and better understanding the scientific dialogue. The classification for this category is also derived from Dumay and Serenko (2015).

2.4 Code articles and ensure reliability

Because structured literature reviews are a form of content analysis, they use subjective coding to analyze the selected articles because the "research is based on data generated by human beings asked to make some kind of judgment" (Hayes and Krippendorff, 2007, p. 77). Therefore, it is "important to ask if the categories for the analysis of content are described or defined in such a way that different people, working independently, will make the same judgments when using the same material" (Lakshman, 2012, p. 482). Thus, the authors use content analysis reliability tests.

In content analysis, using multiple coders "can improve the quality of codings through identifying mistakes and personal biases" (Larsson, 1993, p. 1,521). Additionally, using software to establish reliability measures can help to assess the quality of findings and this "appears to be an underutilized and underdeveloped research technique" (Dumay and Cai, 2014, p. 281). Reliability measures can additionally help researchers in demonstrating that their data: "(a) have been generated with all conceivable precautions in place against known pollutants, distortions and biases, intentional or accidental, and (b) mean the same thing for everyone who uses them" (Krippendorff, 2013, p. 267). Therefore, the software "NVivo 10" (QSR International Pty Ltd, 2014) is used for coding papers, and the statistical package "R" (R Core Team, 2014) with the library "irr" (Gamer *et al.*, 2012) is used to assess Krippendorff's alpha (Krippendorff, 2013, p. 277).

Within reliability measures, Krippendorff's alpha is useful, as "it can be used regardless of the number of observers, levels of measurement, sample sizes, and presence or absence of missing data" (Hayes and Krippendorff, 2007, p. 77). According to this approach, researchers can "rely only on variables with reliabilities above a = 0.800; consider variables with reliabilities between 0.667 and a = 0.800 only for drawing tentative conclusions" (Krippendorff, 2013, p. 325). Therefore, two of the authors separately coded the selected articles and performed Krippendorff's alpha to test the reliability. To solve any discrepancy in coding, the third author was used as an expert rater (Larsson, 1993, p. 1,521). Table I presents the results of reliability testing alongside the content analysis results, which is discussed next. In all instances, the reliability measure for the coding exceeded 0.800. Thus, the authors argue that the results presented are reliable.

3. Results

The following sub-sections present results to answer *RQ1* "How is the KM literature within the public sector developing?" and *RQ2* "What is the focus of the KM literature within the public sector?"

3.1 Evolution of the literature of KM within the public sector

This section presents the results related to *RQ1* by providing insights on how the KM literature within the public sector is evolving. The number of papers, leading journals and most cited authors will answer this research question (Taticchi *et al.*, 2010, p. 5). According to Li *et al.* (2013, p. 1,515), "greater research impact brings citations to and establishes the reputation of a scholar". Therefore, citations represent the impact of a paper on the scientific community and can help in understanding the evolution of the literature. According to Aguinis *et al.* (2011, p. 16), one problem in using CI is "older articles have a greater opportunity to be cited". Dumay (2014, p. 260) suggests that CPY can

counterbalance this tendency. Therefore, the following sections analyze the scholarly impact of the selected articles using CPY.

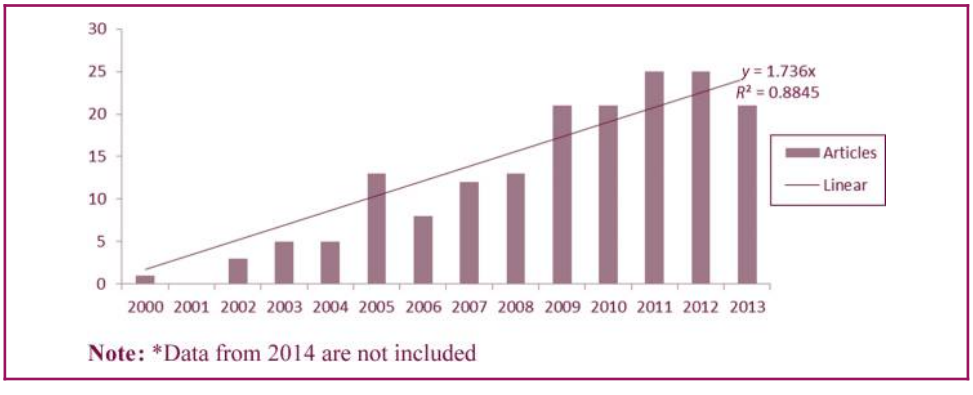
3.1.1 Articles, years and CPY analysis. Analyzing the evolution of articles about KM within the public sector, results show an increase. The literature research identified 180 relevant articles, 55 per cent of which are published after 2010, suggesting a growing trend. Some of the most recent articles are Massingham and Massingham (2014), Hosseini *et al.* (2014), Fullwood *et al.* (2013). Some of the oldest are Martin (2000), Chen *et al.* (2002) and Wiig (2002) (Figure 1).

However, a growing number of articles published in the field also means a decrease in the value of the average CPY. Studies on citation lag and diffusion of scientific ideas are rare (Adams and Clemmons, 2013, p. 194). Therefore, it is impossible to measure precisely the delay between publishing a paper, and when citations appear in other papers. However, similar research does not consider studies published in the past two years "because there was not sufficient time for the articles to be cited" (Dumay, 2014, p. 22). For example, within this sample, the authors observe that the number of papers with zero citations is 37 per cent in 2012, 57 per cent in 2013 and 100 per cent in 2014. The same analysis in the period 2000-2011 never shows more than 10 per cent of the total number of papers with zero citations. Therefore, for the purpose of this study, the CPY analysis excludes the period 2012-2014, as the evidence shows that these articles have not had sufficient time to garner citations.

Interestingly, even without considering the period 2012-2014, the maximum CPY is 27.1, while the minimum CPY is 0 with an average of 2.11 and a median of 1. The data set shows high levels of skewness (3.80) and kurtosis (21.10). Dividing the citation frequency into deciles, the maximum concentration (68 per cent of the papers) is between 0 and 2.71 CPY. Therefore, CPY shows an asymmetrical and picked distribution with a long tail to the right. In other words, most of the papers show a relatively low CPY, while a limited number of papers show higher CPY.

The 15 papers with the highest CPY (Cong and Pandya, 2003; Cranfield and Taylor, 2008; Syed-Ikhsan and Rowland, 2004) show values of CPY that are four times the average. Additionally, within the 15 most cited articles, two out of three are both in the list of the papers with the highest CPY and CI. According to Garfield (1989, p. 5), these highly cited papers can be considered "citation classics". Interestingly, three of these papers (20 per cent of the sample) are studies of the Malaysian context (Mohayidin *et al.*, 2007; Salleh *et al.*, 2012; Syed-Ikhsan and Rowland, 2004), three (20 per cent of the sample) of the UK (Cranfield and Taylor, 2008; Fullwood *et al.*, 2013; Gertner *et al.*, 2011) and two (13 per cent of the sample) of the USA (Firestone and McElroy, 2005; White and Weathersby, 2005). Other papers focus on Greece, Japan, Singapore, Taiwan, the United Emirates and other contexts.

Figure 1 Number of publication and trend



Additionally, analyzing the specific topic of "citation classics", results show that three papers focus on ministry and national government issues (Chong *et al.*, 2011; Riege and Lindsay, 2006; Syed-Ikhsan and Rowland, 2004) and eight focus on KM issues within education and research centers (Cranfield and Taylor, 2008; Fullwood *et al.*, 2013; Gertner *et al.*, 2011). Therefore, results show a high concentration in terms of the geographical area analyzed and in terms of the topic developed. The authors further analyze these results in the following sections.

3.1.2 Journals and authors. Data show that there is a high relationship between the journal rank as proposed by Serenko and Bontis (2013) and the average CPY obtained by articles in the field of KM within the public sector as shown in Table II. The *Electronic Journal of Knowledge Management* (EJKM) is an interesting exception. EJKM is ranked as the ninth journal in the list of Serenko and Bontis (2013). However, the EJKM has a higher rank in terms of citation and CPY for articles about the public sector. Of the articles published in the journal, 55 per cent are over the average and three (Cong and Pandya, 2003; Cranfield and Taylor, 2008; Mohayidin *et al.*, 2007) are in the group of the 15 most cited. Therefore, EJKM has a higher specialization in terms of KM within the public sector, being the third journal in the list in terms of citations and publishes papers that capture greater attention within the literature.

Analyzing the whole group of articles selected, 399 authors wrote 180 papers, with an average of 2.2 authors per article. Interestingly, only 36 authors have written more than one paper. Of these authors, only nine (e.g. Metaxiotis, Ahmad, Syed-Ikhsan) are in the group of 22 authors who wrote the 15 papers with the highest CPY. Therefore, 25 per cent of the authors with more than one paper are within the group of the 15 most cited. Interestingly, 41 per cent of the most cited authors have written more than one paper.

Results shows that only 22 papers (12 per cent of the total) have collaborations between authors of different countries (Behrend and Erwee, 2009; Omona *et al.*, 2014; Tresman *et al.*, 2007). Therefore, international collaborations are rare within the sample analyzed.

3.2 Focus of the literature of KM within the public sector.

The development of a structured and systematic approach to the literature review aims to answer precise questions or test specific hypotheses rather than summarizing the whole set of knowledge of a research topic (Petticrew and Roberts, 2008, Kindle Edition: Location 245). This section aims to answer *RQ2* by identifying the focus of the literature on the topic of KM within the public sector. Further comment on the findings of Table I is presented in the following sub-sections.

3.2.1 Government jurisdiction and public service. The results show that only two papers (Ringel-Bickelmaier and Ringel, 2010; Sartori and Pacheco, 2006) focus on "super-national institutions". A possible explanation of the limited number of studies on the topic is "KM in the United Nations system is in its initial stages" (Larrabure, 2007, p. 3). Therefore, the

Table II Journals, articles and CPY of KM in the public sector

Journal title	*No. of articles*	*Total citation*	*CPY*	*Articles over average*	*(%) articles over average*
Journal of Knowledge Management	35	978	166.58	20.00	57
Journal of Intellectual Capital	0	0	0.00	0.00	0
The Learning Organization	24	353	56.01	10.00	42
Knowledge Management Research and Practice	19	195	42.30	10.00	53
Knowledge and Process Management	7	26	7.33	1.00	14
International Journal of Knowledge Management	10	25	8.83	0.00	0
Journal of Information and Knowledge Management	30	216	26.73	2.00	7
Journal of Knowledge Management Practice	32	106	25.94	4.00	13
Electronic Journal of Knowledge Management	11	290	40.47	6.00	55
International Journal of Learning and Intellectual Capital	12	27	6.93	1.00	8

delay in developing KM practices within some super-national organizations might explain the limited number of publications in the field. Additionally, most public sector entities have national or local bases. Therefore, unlike multinational corporations, there are fewer truly multinational public sector organizations.

Interestingly, a lack of contribution is seen within "state-regional institutions" and "local governments". Most of the papers (112 of a total of 180) are focused on "public service entity", that is publicly funded organizations that perform a specific public service, separate from direct government control, such as a university (Filstad and Gottschalk, 2011; Gertner *et al.*, 2011; Hautala, 2012). Interestingly, articles focusing on public service entity show the highest increasing trend in the last period.

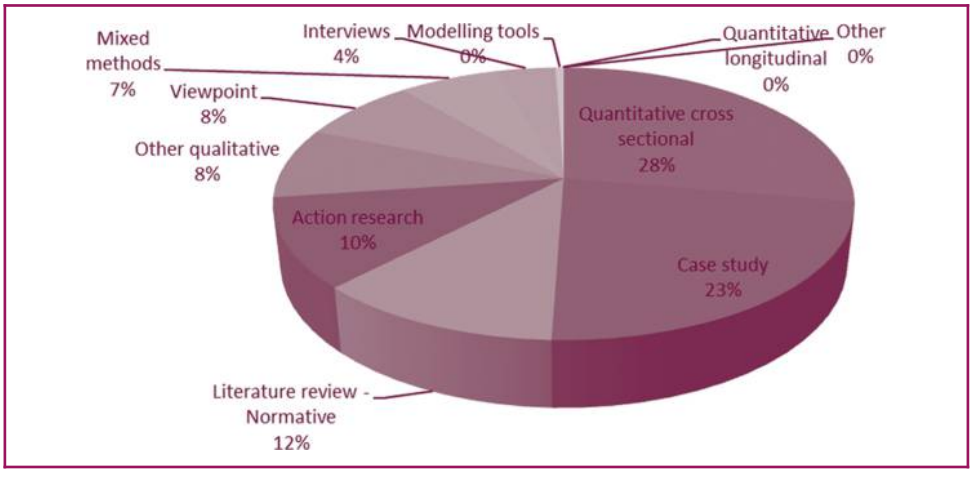
Additionally, the results show that most of the papers (53 per cent of the sample) that analyze "public service entity" focus on "education and research centers" (Amayah, 2013; Batra, 2009; Haslett *et al.*, 2010). Interestingly, while the number of papers on the topic is growing year after year, the scholarly impact according to average CPY is decreasing.

3.2.2 Location. Analyzing location, the results show that Asia is the most studied region with 49 papers representing 27 per cent of the papers (Kuang and Marshall, 2010; Tian *et al.*, 2009). While this result could be because of the growing importance of Asia in terms of the global economy, the analysis of each country shows interesting insights. Within Asia, India is the most analyzed country with 11 articles (Chawla and Joshi, 2011; Patnaik *et al.*, 2013). Malaysia is the second most analyzed country with nine articles (Chong *et al.*, 2011; Salleh *et al.*, 2012). China and Japan have only four articles each (Hasan *et al.*, 2006; Ng and Bryce, 2009). Additionally, 67 per cent of the papers focused on Malaysia and 64 per cent of the papers focused on India are about universities and research centers. Therefore, some countries like Japan and China are under-investigated considering their importance in terms of gross domestic product. India and Malaysia are probably over-investigated, with the research focusing mainly on universities and research centers in these countries.

Moving the analysis from Asia to other areas, the results show that Central America has no articles, while South America and Africa have only three and four papers, respectively (Bas and Kunc, 2012; Oluikpe, 2012). Interestingly, only 15 papers offer an international comparison (Behrend and Erwee, 2009; Grippa, 2009).

3.2.3 Research method. Figure 2 depicts the main research methods used. Quantitative approaches represent 28 per cent of the sample with 50 articles and are the most used approach in the sample (Cegarra-Navarro *et al.*, 2012; Dahanayake and Gamlath, 2013; Kim *et al.*, 2012). Case study is the second most used approach with 41 papers

Figure 2 Articles per research method



representing 23 per cent of the sample (Blackman and Kennedy, 2009; Chen and Cheng, 2012).

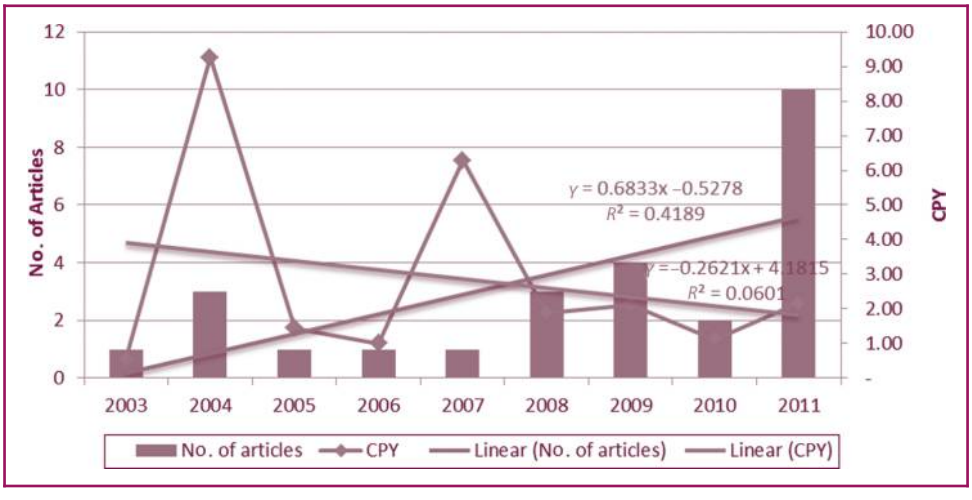
The results show that "quantitative cross-sectional[4]" is the research method that shows the highest growth rate in recent years. In the period 2011-2013, "quantitative cross-sectional" represents, respectively, 40 per cent of the total papers in 2011, 36 per cent in 2012, 57 per cent in 2013 and 43 per cent in 2014. Interestingly, while the number of papers is growing, the average CPY is again decreasing. Even though the average CPY of articles that use this approach is equal to the average of the sample, the distribution among years shows a higher decreasing slope. In the period 2008-2011, the average CPY of articles that use basic statistical approaches is lower by 15 per cent of the average CPY of the sample.

To confirm these results, and considering the high importance of papers focused on education and research, an endogeneity test is performed. Endogeneity is a major concern that affects all empirical research (Peel, 2014, p. 548). More precisely, authors test whether, if omitted, a variable not included in the model could be associated with both the explanatory variable and the explained variable (Chenhall and Moers, 2007, p. 181). In other words, authors need to check that the explained variable (reduction of CPY) is influenced by the explanatory variable (use of quantitative cross-sectional methods) rather than an unobserved variable (focus on education and research) that could be the real cause of the phenomenon. Therefore, the sample is split into two groups. The first group is based on papers focused on education and research and the second group is based on papers not focused on education and research. The results do not show endogeneity for omitted variable problems. Figure 3 depicts the main findings for the whole sample and shows linear trends both for CPY and number of papers.

Interestingly, the basic statistical approaches like descriptive statistics, Student *t*-tests and ANOVA tests are the most used technique. Results show that 23 papers (46 per cent of "Quantitative cross-sectional" papers) use very basic statistical techniques to analyze data (Handzic and Ozlen, 2013; Lindsay *et al.*, 2009). Regression and multiple regression analyses are used in nine studies (Capece and Campisi, 2011; Radaelli *et al.*, 2011), while structural equation models are used in only four studies (Cegarra-Navarro *et al.*, 2012; Roman *et al.*, 2004).

3.2.4 Research framework. Analyzing the research framework results shows that 112 papers (62 per cent of the sample) use or consider a previous framework (Blackman and Kennedy, 2009; Hautala, 2011). At the same time, 42 papers (23 per cent of the sample)

Figure 3 Research method. Quantitative cross-sectional. Papers for the period 2003-2011



propose new frameworks (Chong *et al.*, 2011; Swart and Henneberg, 2007) and only 26 (14 per cent of the sample) do not use any framework having a more explorative approach (Mitleton-Kelly, 2011; White and Weathersby, 2005). Figure 4 presents the main results of the analysis.

Analyzing the evolution over time, the results show an increasing trend for using previous research frameworks or models. Indeed, in the period 2003-2007, only 46 per cent of the papers use a previous research framework, while in the period 2008-2014, 70 per cent of the studies use a previous research framework. Therefore, there is a growing trend in applying previous research methods rather than proposing new ones (Figure 5).

3.2.5 Research theme. Analyzing research themes results shows that 65 papers (36 per cent of the sample) focus on KM as a process (Dixon *et al.*, 2009; Firestone and McElroy, 2005). The second most analyzed theme is KM and strategy with 26 articles that represent 15 per cent of the sample (Boateng *et al.*, 2008; Seba and Rowley, 2010). Information technology, knowledge innovation, personal and organizational learning are the only other themes analyzed by more than 10 per cent of the papers (Bak, 2012; Petruzzelli, 2008; Schulte *et al.*, 2006). The distribution of themes shows that topics are spread, and there is not a high concentration within one single theme. Figure 6 shows the main results.

Analyzing the evolution over time, the results show an increasing trend for focusing on the KM process. In the period 2003-2007, the average CPI is 5.44, while in the period 2008-2011, the average CPI is 2.12. Additionally, in the period 2003-2007, there are 13

Figure 4 Research framework

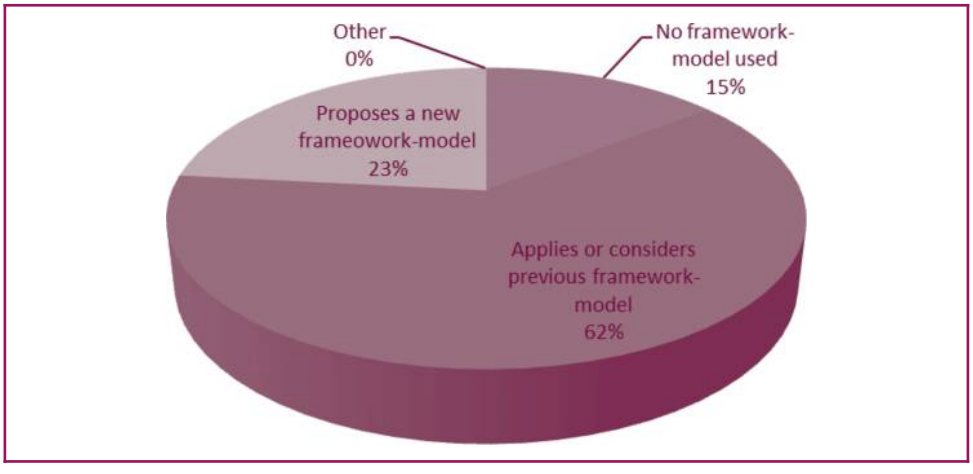


Figure 5 Research framework. Applies or considers previous framework or model

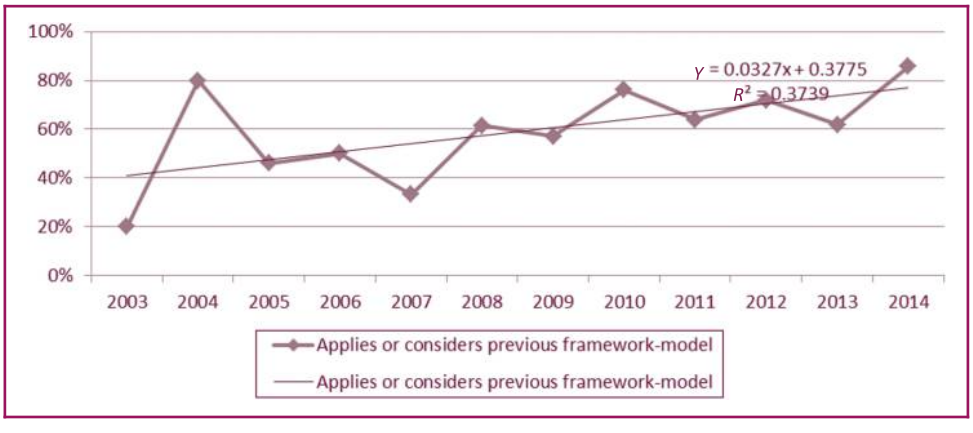
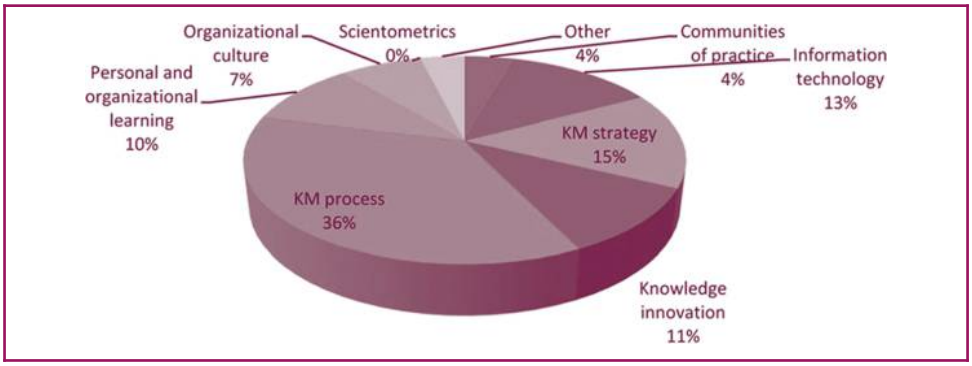


Figure 6 Article themes



papers focused on KM process, while in the period 2008-2011, there are 32 papers focused on the same topic. Therefore, while the number of papers shows a growing trend, the average CPY shows a decreasing trend. Figure 7 shows the main results.

4. Discussion

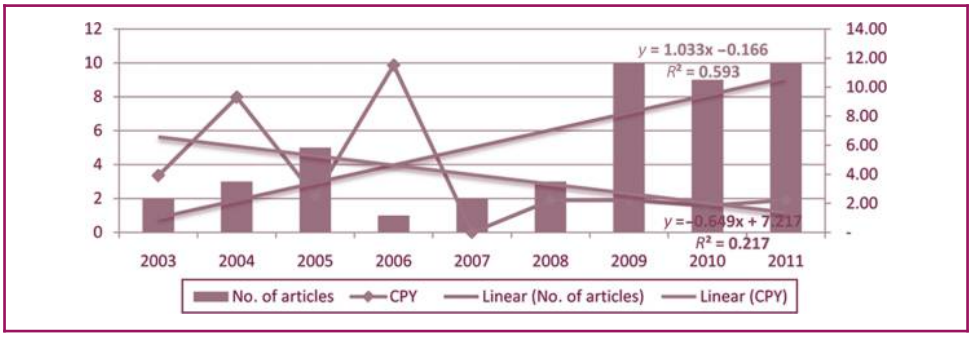
The aim of this section is to discuss the main findings to answer *RQ3*: "What is the future of KM research within the public sector?" In answering this question, the authors develop and address several implications as in the following sub-sections.

4.1 Implication number 1: few authors have high specialization on the topic while most authors contribute just once to the body of knowledge

The findings previously presented do not show the superstar (Matthew) effect, which usually identifies a small number of authors who produce the majority of papers (Serenko *et al.*, 2011, p. 334). Additionally, many authors contribute just once to the body of knowledge. These results confirm previous findings within the KM literature (Dumay and Serenko, 2015, p. 20; Serenko *et al.*, 2010, p. 18, 2011, p. 340), even though some differences can be recognized. Serenko *et al.* (2010, p. 18) state that "this phenomenon took place because of the high number of practitioners who contributed only once". However, within the sample analyzed, practitioners represent a small part of the sample and therefore cannot be the cause of the sporadic contribution of authors to the topic. Additionally, findings show that authors who are more consistent in the topic are able to write articles with higher CPY and citations.

The analysis suggests several implications. First, barriers to entry to the academic discourse are low. Serenko *et al.* (2011, p. 339) state that KM is "a very young, attractive academic field that welcomes contributions from a variety of academics and practitioners".

Figure 7 Articles themes. KM process



Second, because of the low barriers to entry, authors not specialized in the field can move from the general topic of KM or even from other research fields when publishing. Third, authors who are more consistent can easily acquire a higher specialization and visibility. On the one hand, "these findings reflect the youth of the KM field" (Serenko *et al.*, 2011, p. 340). On the other hand, differences between private and public sector, greater pressures for representativeness, accountability and responsiveness and a different context for specific public organizations (e.g. army and law enforcement) are some of the reasons for a higher specialization in the field due to the specific challenges of KM within the public sector.

4.2 Implication number 2: limited international cooperation among authors

International collaborations among authors are low even though academics, rather than practitioners, are the main authors. According to Nomaler *et al.* (2013, p. 966), "internationally co-authored papers are known to have more citation impact than nationally co-authored paper, on average". International collaboration can stimulate dialogue between scholars of different background and therefore lead to unique outcomes and more creative solutions (Nomaler *et al.*, 2013, p. 967). Interestingly, the low level of international collaboration matches the reduced number of papers that develop international comparisons or focuses on international public organizations.

4.3 Implication number 3: specialization of some journals in the field and a need for a wider dissemination activity

The findings show some specialization can be identified among journals. These results build on the findings of Serenko and Bontis (2013). The EKJM has a greater specialization of articles on the public sector, perhaps because it is connected with several international conferences (e.g. European Conference on Knowledge Management, International Conference on Intellectual Capital and Knowledge Management, European Conference on Intellectual Capital). Most of these conferences have mini-tracks in the topic of KM within the public sector. Therefore, scholars and editors can take an active role in disseminating research in specific fields, contributing to building a scientific dialogue and increasing the number of citations.

4.4 Implication number 4: several areas in the world need to be studied more deeply while others are over-analyzed

Analyzing the focus of articles, a clear picture emerges of both under- and over-representation. Serenko *et al.* (2010, p. 17) find that within the general topic of KM, "a minority of countries generates the most research output". Within the field of public sector, the results show a wider distribution of papers. Even though the UK, Canada and the USA have a greater number of papers, several differences are found in emerging countries.

India and Malaysia are the most studied countries in Asia. This may be the result of active policies in these countries to promote KM. For example, the Malaysian Government is leading an intensive program to improve the quality of education. As Mohayidin *et al.* (2007, p. 301) identify, "one of the major steps that has been identified by the government to achieve this goal is to enhance the performance of local universities through the application and implementation of an excellent KM system". Additionally, in India, the Government plans to help India to become a "knowledge economy" (Batra, 2009, p. 351).

This public policy emphasis appears to drive the development of research through government grants. In Malaysia "under the aegis of the National Higher Education Strategic Plan beyond 2020 and National Higher Education Action Plan 2007-2010, the government has introduced extensive reforms in its funding mechanisms for higher educational institutions" (Ahmad *et al.*, 2012, p. 25). Interestingly, teaching and learning is one of the five pillars of the Malaysian critical agenda program (Ahmad *et al.*, 2012, p. 25). Therefore, the growing attention of national governments and research funding opportunities fuels the

development of studies focused on these countries. The side effect is a growing number of studies focused on the same area while other areas of the world are almost ignored (e.g. South America and Africa).

4.5 Implication number 5: develop a research synthesis for the more analyzed topics and a new focus for under-investigated themes

The findings show a high concentration of papers in a limited group of topics. Education and research are the most analyzed topic with 96 papers representing 53 per cent of the sample. This suggests the need for the development of a research synthesis (Denyer and Tranfield, 2006). Research-synthesis acts as an intelligent agent "searching through mountains of potentially contradictory research to uncover the nuggets of knowledge that lie buried underneath" (Stanley, 2001, p. 131). Several approaches can be used according to the epistemological approach adopted (e.g. meta-analysis, meta-ethnography, meta-synthesis). Despite fundamental differences between methods, they all "are concerned with putting together findings from a number of empirical studies in some coherent way" (Tranfield *et al.*, 2003, p. 214).

At the same time, research should focus on under-investigated themes. Analyzing jurisdiction, for example, regional-local government, is an under-investigated topic as well as super-national organizations (e.g. EU; UN). On the one hand, the development of studies within some super-national institutions, like the UN, can be particularly problematic. According to Larrabure (2007, p. 3), "the nature of the work, the knowledge requirements and the available resources for KM vary greatly across the organizations of the United Nations system". On the other hand, "there are many different and unconnected KM projects currently in place within the United Nations system" (Larrabure, 2007, p. 3). Therefore, an increased effort to investigate these specific entities could be particularly beneficial for the community of scholars and practitioners due to their importance for a wide number of people.

4.6 Implication number 6: develop more interesting research that questions established conclusions

Research on KM is facing an important epistemological debate. Indeed, "whereas medical research enjoys a considerable and extensive epistemological consensus this is untrue of management research in general" (Tranfield *et al.*, 2003, p. 212). A call for more performative studies versus an ostensive approach is growing among scholars. Dumay (2012, p. 12) states the "implication for researchers is that they must then abandon research methodologies that take a helicopter view". Interestingly, according to Mouritsen (2006, p. 835), this does not mean that statistical approaches are impossible, but there is a call "for more interesting research that questions established conclusions". As Dumay and Serenko (2015, p. 22) state, "the implications for future KM researchers is that they need to think seriously about how their future research will be interesting enough and make a significant contribution to KM (and maybe even become a citation classic)". As previously stated, KM research in the public sector has specific challenges. Differences between private and public organizations, great pressures for representativeness, accountability and responsiveness and different context for specific public organizations are some of the reasons that require researchers to get "their hands dirty" (Dumay and Serenko, 2015, p. 22) working in the public sector.

5. Conclusion

To conclude this paper, the authors reflect on the initial motivation to perform this study, based on the argument that the public sector presents a particular research context because of a different level of representativeness, accountability and responsiveness. As such, the authors expected to find a wide variety of research projects spanning many different nations, organizational contexts and, especially, research trying to understand KM practice inside public sector organizations. However, this was not the case. Instead, they

found that the public sector KM literature is fragmented, dominated by unrelated research mainly in the education and research sectors, with a distinctly Malaysian and Indian focus, supported by ostensive research methodologies. It appears government policy and research funding supports this particular research focus. However, while Malaysia and India are populous countries, they are hardly leaders in the field, as the majority of research published from this perspective has little scholarly impact. This has important ramifications for the future of KM research, because if the top KM journals continue to accept and publish research with this focus, public sector KM will gain a reputation for low-impact outcomes and be "uninteresting" at best.

Furthermore, the domination of education and research highlights that many KM researchers are more comfortable researching what they know, rather than exploring the boundaries of other public sector organizations. Surprisingly, there were few articles investigating key public services such as police, fire, ambulance and the armed forces (Jones and Mahon, 2012; Nordin *et al.*, 2009; Seba and Rowley, 2010), where knowledge is key to saving lives and protecting citizens. Many KM researchers are afraid to venture out into investigating how knowledge is essential and better enables delivering these key services. Hence, Jones and Mahon's (2012, p. 774) argument that KM is important in these contexts is not borne out in the academic literature. Why might this be the case?

This may be due to lack of access. However, it is more likely due to lack of research focus, because the related field of intellectual capital presents several prominent examples investigating these contexts (Collier, 2001; Massingham *et al.*, 2011). It appears that researchers have chosen the easier paths offered by education and research, rather than a path that would have the most impact on society. Therefore, the authors call for more research grounded on new and evolving issues such as the safety and security of people because the research agenda on education and knowledge seems not to be making significantly new contributions. This is not to say that researchers should stop investigating the education and research field but that they do need to ensure the research is relevant and contributes significantly to KM practice and theory.

Another reason why there is a dominant influence on the education and research sectors is a low involvement of practitioners in the articles reviewed. If academics want to make a significant contribution to public sector KM research, then they need to get out of their academic ivory towers and engage more with practice. Researchers have long been accused of doing research that contributes little if anything to practice and this is seen as a major challenge (Evans *et al.*, 2011), and research into public sector KM is no different. As Tucker and Lowe (2014) contend, practitioners are from Mars and academics are from Venus. As exemplified in the findings, there is a disconnection between researching KM from a quantitative versus a practice (case study) perspective, thus the vast majority of articles do not research practice, specific organizations or engage practitioners as fellow researchers and authors. Therefore, there is a need for more performative research (Mouritsen, 2006) and or interventionist research into public sector KM (Jönsson and Lukka, 2005; Dumay, 2010), whereby academics get their "hands dirty" to demonstrate how KM can live up to the challenges presented by the public sector.

Additionally, according to Daly *et al.* (2014, p. 581), "innovative practice constitutes new knowledge, that scholars need access to practitioners to guide research agendas so their ideas should captivate both practitioners and consumers". Therefore, there is a call for practitioners to contribute to the scientific dialogue being involved in research agendas with academics and for practitioners to publish innovations and results of their "in the field" activity. Interestingly, Serenko *et al.* (2010, p. 16) observe "the role of practitioners [. . .] to the body of knowledge has been declining". On one hand, as Daly *et al.* (2014, p. 581) observe "there is general consensus that scholarly journals are largely inaccessible to practitioners". Alternately, knowledge acquired and produced by practitioners represents their specific competitive advantage, and it is not easy for them to give it freely to scientific

publications. Therefore, there are significant barriers preventing both academics and researchers from collaborating from a KM perspective.

The main challenge is how to overcome these barriers to engaging academics with practitioners in public sector KM research. Arguably, there are far too few communities of practice within the public sector supporting KM practitioners so that "private sector knowledge management (KM) concepts and practices might contribute to the further development of public sector quality improvement" (Bate and Robert, 2002, p. 643). However, spanning academic boundaries to become involved in the public sector is challenging because "Academic research is typically orientated towards other academics, rather than practitioners" (Evans *et al.*, 2011, p. 10). However, despite the wide gap between academia and practice, it is possible to bridge the gap and there are several prominent examples of academics and practitioners collaborating in the related field of intellectual capital (Dumay and Guthrie, 2006; Dumay, 2010, 2011). Therefore, while this type of collaboration is arguably unsupported adequately by academia, collaborating is possible and welcomed by practitioners who want to learn from academics. Thus, academics are challenged to get out of their "ivory towers" and engage with public sector KM practice to break the cycle of repetitive research in education and research fields that continually lacks academic relevance, let alone relevance in practice.

One last important comment is where and how researchers publish their articles. As shown above, the most prominent KM journals publish the majority of the research and these journals gain the most citations and thus research impact. However, when conducting this research, there was considerable trouble accessing several of the less prominent journals locked behind academic pay walls. In one case, the second author had to get his University to subscribe to a particular journal because the cost of accessing the individual articles was higher than the journal's subscription price.

However, in the case of the EJKM, this journal is emerging as a good source of public sector KM articles that are starting to have above average citation impact. The main differentiating feature of the EJKM is that it is an open-source journal. Open source means anyone can access the articles it publishes. This is important because open-source publishing is becoming more prominent and offers a greater opportunity for researchers to disseminate their research to practice. Thus, there are signs that research into not only public sector KM, but other forms of KM research and how it connects and has meaning, is changing, and research investigating how KM works in important contexts is likely to have more impact in the future.

This study suffers from some limitations. First, only journal articles published in leading KM journals are used without considering other sources like books, book chapters or professional reports. Even though, in academic research, the peer-review process is accepted as a synonym for quality in published works (Hart, 1999), by including only journal articles, important contributions in other works may be excluded. Second, the validity of results can only be considered at the time of the analysis. Future contributions to the field not considered in this study could change the validity of some results. Readers should consider that structured literature reviews are not a panacea providing definitive answers, rather they aim to identify where research is currently lacking and offer pathways for future research.

Notes

1. Scopus is the one of the largest abstract and citation database of peer-reviewed literature and it is available at: www.scopus.com

2. CI is calculated by Harzing's *Publish or Perish* as the total number of citations of the paper as returned by Google Scholar at the time of the research.

3. CPY is calculated by Harzing's *Publish or Perish* as CI divided by the number of the years between the date of analysis and the date of publication.

4. According to Bajpai (2011, p. 34), "Cross – sectional research design involves the collection of information from a sample of a population at only one point of time. In this study, various segments of the population are sampled so that the relationship among the variables may be investigate by cross tabulation".

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