

## How is “knowledge management” similar to or different from “information management”? An informetrics perspective

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### Abstract

This paper compares “information management” (IM) and “knowledge management” (KM) through the use of informetric techniques by examining the subject terms, author-supplied keywords and title words that are used to describe IM and KM literature as well as the journals that disseminate IM and KM research. Data was extracted from the Library, Information Science and Technology Abstracts (LISTA) database and analysed using different computer-aided software programs. The strength of association and coverage ratio between IM and KM and the subject terms, author-supplied keywords, title words and journals that are common in IM and KM literature were assessed, with a view to discovering the relationship between the two concepts. It was observed that IM and KM are related terms in that they share a number of subject terms, title words, journals and author-supplied keywords. However, the strength of association and coverage ratio were found to be too small, implying a weak relationship between IM and KM. Recommendations for further research are offered.

### Introduction

Is “knowledge management” (KM) the same as “information management” (IM)? We can reverse this question and ask: is “information management” (IM) the same as “knowledge management” (KM)? The answer to the second question would be in the affirmative to some people, such as information professionals/workers who believe that KM is actually what they have always done, that is IM (Kim, 2000; Read-Smith, Ginn, Kallaus, Fosegan, Logan & Schneider, 2002:317). However many authors admit that there is no consensus about what constitutes knowledge management (KM), on the one hand, and information management (IM) on the other. The two concepts are often treated as synonymous. This synonymous usage of KM and IM is well captured in Chen, Snyman and Sewdass (2005:2), who observe that:

Document management, information management and knowledge management have been three phrases in the vocabulary of management for some time now. Although these three phrases have been used and discussed exhaustively, there is still some ambiguity about what they really mean (there are numerous definitions for each phrase), confusion between them and little consensus on how to execute them (there are thousands of tools on the market). For example, in many cases, KM is being used simply as a synonym for IM; some organizations have been under the impression that they were implementing KM, whereas they were actually implementing DM or IM.

However, other authors such as Al-Hawamdeh (2002:21) argue that IM is just a part of KM. Kim (2000), too, alludes to the fact that KM includes but is not limited to IM, and observes that managing books, journals and other similar resources and conducting searches in such resources for clients or arranging for the circulation of materials is but a small part of KM. In their discussion of the differences between document management, information management and knowledge management, Chen et al (2005:14) observe that the three concepts fulfill different functions; focus on different areas; and involve different disciplines and organisational levels. They are similar in that the three approaches contribute to business efficiency and effectiveness; consider the processing of information in some ways; use information technologies as enablers; and require skilled and knowledgeable workers.

Graphical representation of the relationship between IM and KM as offered by Chen et al (2005:16) implies that IM is not entirely KM and vice versa. However, the authors illustrate that IM and KM are in a way related concepts. Previous studies such as the following also indicate that IM and KM are interrelated:

- From *information management to knowledge management: some perspectives on development* (Middleton 1999)
- *Jumping from information management towards knowledge management* (Mendez 2000)
- From *information management to knowledge management: beyond the “hi-tech hidebound” systems* (Malhotra, Srikantaiah & Koenig 2000)
- *Understanding knowledge management and information management: the need for an empirical perspective* (Bouthillier & Shearer 2002)
- *Knowledge management: re-thinking information management and facing the challenge of managing tacit knowledge* (Al-Hawamdeh 2002)
- *The Impact of Knowledge Management on Information Management Practice* (Clarke 2006)
- *Information management as an enabler of knowledge management maturity: A South African perspective* (Kruger & Johnson 2010).

Onyancha and Ocholla (2009a) found that the term “Information Resources Management” (IRM) featured prominently in the KM literature as a subject term, from which the authors concluded that IRM is a related term (RT) of KM. We have noted that the EBSCO databases’ thesaurus uses IRM as an alternative subject term in the place of IM to index all documents on information management; this implies that Onyancha and Ocholla’s findings meant that KM is a related term of IM. Table 1 provides EBSCO’s classification of IM and KM. In its description of which documents are classified under each subject heading, namely IM and KM, the EBSCOhost thesaurus (EBSCOHost Industries, 2011) explains thus:

- Information resources management (used for information management): Here are entered works on the coordination of information gathering and dissemination responsibilities within an organisation. The concept combines under one management such traditional organisational functions as: ADP management, communication technology management, procurement, formulation of regulations standards, paperwork management, security, information systems development, data base management, and library and information services.

- Knowledge management: Here are entered works on the process of capturing, storing, organizing and accessing information within an organisation and using the information to meet organisational goals and objectives.

From the foregoing discussion and the illustration in Table 1, it appears that IM and KM are interrelated but not synonymous concepts. This observation is also alluded to by Al-Hawamdeh (2002). Al-Hawamdeh’s article implies that KM goes beyond IM (management of explicit knowledge) and includes the management of tacit knowledge. Notable in Table 1 is the use of one concept as a related term for the other, in that IM is treated as a related term of KM and vice versa. However, whereas both concepts share common broad terms and a few RTs in Table 1, they nevertheless differ in the composition of their RTs and narrower terms. This leads us to ask: how exactly are the two concepts related? How different is KM from IM? What are the similarities between KM and IM? How closely related are the two concepts?

**Table 1: EBSCOhost Thesaurus: Information management and knowledge management**

	<b>INFORMATION RESOURCES MANAGEMENT</b>	<b>KNOWLEDGE MANAGEMENT</b>
<b>Broader Term</b>	Information services – Management Management	Information services – Management Management
<b>Narrower Term</b>	Cataloguing – Management Educational evaluation – Utilisation Evaluation – Utilisation Gatekeepers Indexes – Management Information audits Information sharing Personal information management Records – Management Research use Strategic information system Vocational guidance information systems	Sense-making theory (Communication)
<b>Related term</b>	Chief information officers Information needs Information overload Information professionals Information resources Information retrieval Information technology <b>Knowledge management</b> Library science Management information systems Mass media use Resources management	Chief information officers Communities of practice Corporate culture Data mining Information architecture <b>Information resources management</b> Information science Information technology Innovation management Intellectual capital Knowledge workers Management information systems Organisational learning

		Website development industry
<b>Used for</b>	Information control	KM (Business)
	<b>Information management</b>	Management of knowledge assets
	Information resource management	
	Information systems management	
	IRM	
	IRM (Information resources management)	

This paper does not seek to compare KM and IM by examining the definitions of the concepts, since by so doing we would reproduce what is already published and, to some extent, contestable. Instead, the paper introduces another perspective on describing the two concepts in an attempt to provide a deeper understanding of the similarities and differences between KM and IM. The whole idea is to gauge how useful informetrics approaches are in offering alternative means of defining or describing concepts that have otherwise eluded a universal consensus. In order to answer the above-mentioned questions, the paper seeks to:

1. Compare subject terms and title terms that are commonly used to describe IM and KM literature, as well as the common journals that publish IM and KM literature.
2. Determine the coverage overlap of IM and KM literature in the library, information science and technology abstracts (LISTA) database and in journals.
3. Determine the strength of association between IM and KM.

### Methodology

LISTA is one of the most comprehensive databases that index library and information science publications. Besides, the use of controlled vocabulary to index publications in the LISTA database ensures that subject terms are uniformly applied across most (if not all) publications, thereby improving reliability and validity of the database and its bibliographic data. Relevant data was extracted from the LISTA database between 13 and 18 August 2010. The search was conducted within the “subject terms” field using the keywords *information resources management* and *knowledge management*. The search limiters were set as follows:

- Publications/documents published between 2001 and 2009 were included in the analysis.
- The search was limited to “articles” only as this type of document is the most commonly used to report on research findings. Other document types indexed in LISTA are bibliographies, books, book chapters, book reviews, case studies, conference papers, dissertations, editorials, entertainment reviews, interviews, patents, proceedings, product reviews and reports.
- Only articles that were published in scholarly peer-reviewed journals were downloaded for analysis.

The main sources of data for analysis were titles of the articles, subject terms, author-supplied keywords and journals that published IM and/or KM literature between 2001 and 2009. Titles were used as sources of data to compare IM and KM because they are important components of any scientific article, as they form part of the access points in search and retrieval systems (Yitzhaki 2001:759). In addition to their role as access points, subject terms and author-

supplied keywords also reveal the contents of a publication, thereby acting as descriptive terms of a concept covered in the research article(s). Journals, too, may be used to examine the scope and breadth of a researched concept. Various studies (Ocholla, Onyancha & Britz 2010; Onyancha & Ocholla 2009a; Onyancha & Ocholla 2009b; Whittaker 1989) have used title, subject and/or full-text words to describe and map word (or concept) relationships by examining the co-occurrence of words within the titles, subjects and full texts.

Data was extracted using a search query “SU ‘*Concept*” where *concept* stands for either “Information resources management” (in place of IM) or “Knowledge management”. Once the relevant data was extracted from the database, Microsoft Excel and Notepad software were used to store and clean the data, respectively. Titles that were not written in English were excluded from the analysis of title words. Also excluded were titles that were not descriptive or informative enough, e.g. “in this issue”, “what is on”, “keynote speakers”, etc. Each type of data (i.e. titles, subjects, journals and author-supplied keywords) was analysed separately in order to compare the similarities and differences between IM and KM.

In order to find out how closely related the two concepts are, the strength of association and coverage overlap ratios were computed as follows:

1. Strength of association

The strength of association between IM and KM in terms of the number of journals, subject terms (words), author-supplied keywords and title terms was calculated using Krsul’s (2002) formula. The same technique has been used by various authors (Coulter, Monarch & Konda 1998; Onyancha & Ocholla 2007). The formula is expressed as follows:

$$S_{ij} = \frac{C_{ij}^2}{C_i C_j}, 0 \leq S \leq 1$$

where,  $C_i$  is the number of records in which term  $D_i$  appears; and  $C_j$  is the number of records in which term  $D_j$  appears.

2. Coverage overlap ratio

Although commonly applied to the coverage of journals in indexing databases (Diodato 1994:52), coverage overlap ratio can be used to measure the extent of intersection ( $\cap$ ) and union ( $\cup$ ) of two documents or words in a database or document, respectively. The overlap ratio is expressed as follows:

$$\frac{\text{number of items in } (A \cap B)}{\text{number of items in } (A \cup B)}$$

where items can be journals in a database, words in different documents, or titles on a given concept and indexed in a particular database.

The two approaches are based on the assumption that the more frequently two or more words appear together in a document or several documents, the more closely related they are. Co-word analysis and co-citation analysis are two informetric techniques that are commonly

employed to assess relationships between words or documents (including authors and journals) in terms of co-occurrence of words and the frequency with which two documents or authors or journals are cited together in future documents or journals or by given authors (Ikpaahindi 1985; Kostoff 2001; Schneider & Borlund 2004).

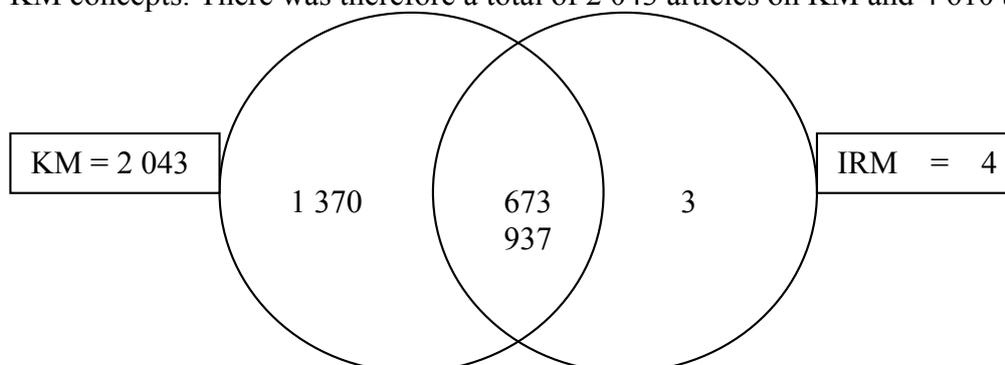
### Results and discussion

This section presents and discusses comparisons between IM and KM under the following sub-headings:

- Coverage of IM and KM literature in LISTA;
- Subject terms describing IM and KM;
- Author-supplied IM and KM keywords;
- Journals covering IM and KM; and
- Titles of IM and KM articles.

#### *Coverage of IM and KM literature in LISTA*

A combined total of 5 980 articles on IM and KM were published between 2001 and 2009, as indexed in LISTA. Of these, 3 937 records, accounting for 65.8%, focused specifically on IM and 1 370 (22.9%) discussed KM. A total of 673 (11.3%) articles discussed both the IM and KM concepts. There was therefore a total of 2 043 articles on KM and 4 610 articles on IM.



In terms of the concepts' associatedness, the strength of association between IM and KM was 0.07 while the coverage overlap of the two concepts between 2001 and 2009 was 0.11. These values are far below the absolute figure of 1 (one) which would have indicated a perfect relationship. The closer the strength of association or overlap ratio is to 1, the stronger the relationship between two variables under investigation, which in this study are the concepts of IM and KM. The values of 0.07 and 0.11 therefore imply that although there is some kind of relationship between IM and KM, that relationship is weak.

#### *Subject terms describing IM and KM*

A comparison of the most commonly used subject terms to index IM and KM, respectively, is given in columns 1 and 4 of Table 2. The most commonly used terms to describe KM as shown in Table 2 include *Information Resources Management* (used for Information Management) which yielded a total of 650 articles, accounting for 31.8% of KM's total publications (i.e. 2 043). *Information Technology* was in the second position with 456 (22.3%) articles, followed by *Information Science* (455 or 22.3%), *Information Retrieval* (182 or 8.9%), *Information Services* (170 or 8.3%) and *Management Information Systems* (167 or

8.2%). On the side of IM, the most common subject term was *Information Technology* which yielded 791 articles, accounting for 17.2% of IM's total articles (i.e. 4 610), followed by *Information Science* (777 or 16.9%), *Information Retrieval* (662 or 14.4%), *Knowledge Management* (653 or 14.2%) and *Information Services* (634 or 13.8%). Table 2 illustrates that although *IM* topped the list of KM subject headings, *KM* was ranked fourth as the most commonly used subject heading to describe IM. Regarding their associatedness, a total of 1 744 subject headings were common to IM and KM literature, accounting for 71.4% and 37.3% of KM's and IM's total subject headings, respectively. There were 2 443 and 4 677 subject headings that were used to index IM and KM, respectively. The strength of association between IM and KM in terms of the subject headings was 0.27, while the concepts' coverage overlap of subject headings was 0.32.

**Table 2: Subject terms used to describe IM and KM, 2001–2009**

SUBJECT TERMS (IM) (N=4610)	No.	%	SUBJECT TERMS (KM) (N=2043)	No.	%
Information technology	791	17.2	Info resources management	650	31.8
Information science	777	16.9	Information technology	456	22.3
Information retrieval	662	14.4	Information science	455	22.3
Knowledge management	653	14.2	Information retrieval	182	8.9
Information services	634	13.8	Information services	170	8.3
Information resources	548	11.9	Management information systems	167	8.2
Info storage & retrieval systems	518	11.2	Library science	164	8.0
Libraries	453	9.8	Management	152	7.4
Digital libraries	415	9.0	Intellectual capital	147	7.2
Records – Management	391	8.5	Data mining	140	6.9
Electronic information resources	375	8.1	Research	130	6.4
Library science	325	7.0	Organizational learning	129	6.3
Research	281	6.1	Information resources	125	6.1
Management information systems	230	5.0	Information services – Management	116	5.7
Information professionals	224	4.9	Libraries	109	5.3
Management	223	4.8	Corporate culture	108	5.3
United states	223	4.8	Knowledge workers	94	4.6
Librarians	203	4.4	Industrial management	88	4.3
Documentation	188	4.1	Info storage & retrieval systems	83	4.1
Internet	163	3.5	Business enterprises	79	3.9

*Title words describing IM and KM*

An examination of the descriptive words used in the IM and KM titles showed that the words *Information* and *Knowledge* were the most common, followed by the word *Management* in each case. Table 3 reveals that the other words that were commonly used to describe the two concepts include *analysis, case, data, development, libraries, library, research, study* and *systems*. An examination of the entire list of terms generated from the titles of IM and KM literature revealed that all 20 words in Table 3 were common to IM and KM literature, a situation that implies a close association between the two concepts as perceived by LIS scholars. However, it was noted that out of the 3 296 words in KM titles, 2 434 (73.8%) appeared in the IM titles, thereby accounting for 39.3% of IM's total number of title words (i.e. 6 198). The strength of association and coverage overlap ratio were 0.29 and 0.34 respectively.

**Table 3: Title words describing IM and KM**

No.	Title Word (IM)	Frequency	No.	Title Word (KM)	Frequency
1	Information	1 202	1	Knowledge	973
2	Management	593	2	Management	610
3	Library	402	3	Information	375
4	Knowledge	390	4	Library	105

5	Digital	356	5	Study	104
6	Systems	303	6	Systems	94
7	Libraries	203	7	Learning	89
8	Study	181	8	Research	81
9	Electronic	172	9	Sharing	72
10	Retrieval	168	10	Case	71
11	System	167	11	Science	67
12	Research	163	12	Model	62
13	Web	152	13	Organizational	58
14	Data	143	14	Analysis	56
15	Development	143	15	Business	55
16	Records	143	16	Development	55
17	Case	121	17	Data	54
18	Resources	117	18	KM	54
19	Access	114	19	Libraries	54
20	Analysis	113	20	Framework	53

*Author-supplied keywords used to describe IM and KM*

The author-supplied keyword *knowledge management* topped the lists of author-supplied keywords of IM and KM literature. The other author-supplied keywords that occurred in both IM and KM literature include *knowledge sharing*, which was placed in the second position in KM literature and in position 15 in IM literature, while *information management* took positions 3 and 2 in KM and IM literature, respectively. Other common keywords in Table 4 include *information technology*, *communication technologies*, *information retrieval* and *information*. This pattern is in tandem with the pattern witnessed in the analysis of the subject terms and title keywords. It should however be emphasised that since there is no control of vocabulary in the allocation of author-supplied keywords (as these are supplied at the author’s discretion), the number of common keywords will be small. Nevertheless, it can be argued that since the authors are more conversant with the content of their research, the author-supplied keywords could provide a good measure for comparing two concepts using the terms used to describe them. In total, there were 1 463 common keywords, which accounted for 26% and 48.9% of IM and KM’s author-supplied keywords. The strength of association between IM and KM in terms of the author-supplied keywords was 0.13, while the coverage overlap ratio was 0.20.

**Table 4: Author-supplied keywords describing IM and KM**

Author-Supplied Keywords (KM)	Frequency	Author-supplied keywords (IM)	Frequency
Knowledge management	397	Knowledge management	128
Knowledge sharing	69	Information management	121
Information management	57	Information retrieval	109
Models	41	Information systems	78
Knowledge management systems	36	Digital libraries	72
Knowledge	32	Internet	56
Knowledge transfer	31	Libraries	46
Intellectual capital	31	Academic libraries	35
Innovation	26	Information technology	35
Information science	26	Data security	33
Data mining	24	Collaboration	30
Tacit knowledge	21	Project management	26
Information technology	20	Metadata	25
Communication technologies	19	Electronic resources	24
Learning	17	Knowledge sharing	24
Knowledge creation	17	Evaluation	23
Information retrieval	16	Records management	23
Information	16	Communication technologies	23

Communities of practice	16	Electronic journals	22
Knowledge economy	15	Digital storage	22

### Sources publishing IM and KM research

Tables 5 and 6 provide the 20 journals most commonly used to publish IM and KM literature, respectively. Leading the pack in Table 5 is the *Information Management Journal*, which published a total of 232 articles, accounting for 7.5% of 4610 articles published on IM. In the second position is the *Library & Information Research* journal with 258 (5.6%) articles, followed by *Information Processing & Management* (207 or 4.5%), the *Journal of the American Society for Information Science & Technology* (204 or 4.4%) and the *International Journal of Information Management*, which yielded 202 (4.4%) articles. On the side of KM, the leading journal was the *Electronic Journal of Knowledge Management*, which published a total of 114 articles between 2001 and 2009, accounting for 5.6% of the total number of articles published on KM during the same period. *VINE* was ranked number two with a total of 112 (5.5%) articles, followed by the *Journal of the American Medical Information Association* (99 or 4.8%) and the *Journal of Information & Knowledge Management* (84 or 4.1%). Some of the journals that publish both IM and KM, as illustrated in Tables 5 and 6, are *Communications of the ACM*, *El Profesional de la Información*, *Information Management Journal*, *Information Resources Management Journal*, *Information Systems Management*, *Journal of Information Science* and the *Journal of the American Medical Informatics Association*. In total, there were 213 (83.2%) out of 256 KM and 213 (55.1%) out of 387 IM sources that were common, thereby generating a strength of association value of 0.46 and coverage overlap ratio of 0.50.

**Table 5: Sources publishing IM literature (N=4 610)**

	Articles	%
Information Management Journal	348	7.5
Library & Information Research	258	5.6
Information Processing & Management	207	4.5
Journal of the American Society for Information Science & Technology	204	4.4
International Journal of Information Management	202	4.4
Electronic Library	150	3.3
El Profesional de la Información	120	2.6
Journal of Information Systems Education	117	2.5
Information Systems Management	107	2.3
Communications of the ACM	96	2.1
Journal of Information Science	89	1.9
Information Management & Computer Security	83	1.8
Journal of the American Medical Informatics Association	80	1.7
Serials Librarian	80	1.7
Quarterly Bulletin of the International Association of Agricultural Information Specialists	75	1.6
Information Resources Management Journal	74	1.6
Information Research	71	1.5
Journal of Library Administration	69	1.5
Records Management Journal	69	1.5
VINE: The Journal of Information & Knowledge Management Systems	69	1.5

### Conclusions and recommendations

This article began by posing the following interrelated questions: How is knowledge management similar to or different from information management? Is “knowledge management” the same as “information management”? Is “information management” the

same as “knowledge management”? Based on the literature review presented in the introduction to this paper and the presentation of data, we concur with most scholars such as Al-Hawamdeh (2002), Kim (2000) and Onyanha & Ocholla (2009a) that IM is related to KM, at least as far as LIS scholars are concerned. The study has also shown that there are several similarities between IM and KM, just as there are several differences between the two concepts. In terms of their coverage in the LISTA database, this study has revealed not only that the number of papers published on each concept differs but also that the coverage overlap and strength of association values are small, a situation that implies that the two concepts are not as closely related as is generally believed. Except for the sources that publish IM and KM literature which generated higher values of the strength of association and coverage overlap ratio, the rest of the analyses generated very small values, thereby indicating a weak relationship between IM and KM. In terms of subjects, there were 1 744 subject headings that were common to IM and KM literature. These subject headings include *Information technology, Information science, Information retrieval, knowledge management, information resources management, information services, information resources, information storage & retrieval systems, libraries, library science, research, management information systems, and management*. It is worth mentioning that IM was among the subject terms that were used to describe KM, while the reverse was also noted. This pattern seems to follow the indexing policy outlined in EBSCO’s thesaurus concerning the scope of coverage for each subject term, whereby, as mentioned in the introduction, IM is treated as a related term to KM and vice versa.

**Table 6: Sources publishing KM literature (N=2 043)**

	Articles	%
Electronic Journal of Knowledge Management	114	5.6
VINE: The Journal of Information & Knowledge Management Systems	112	5.5
Journal of the American Medical Informatics Association	99	4.8
Journal of Information & Knowledge Management	84	4.1
International Journal of Information & Communication Technology Education	78	3.8
Journal of Information Science	71	3.5
International Journal of Knowledge Management	68	3.3
Library & Information Update	65	3.2
Journal of Knowledge Management	49	2.4
Knowledge Organisation	39	1.9
El Profesional de la Información	38	1.9
Information Systems Management	35	1.7
SAJIM: South African Journal of Information Management	35	1.7
Information Management Journal	31	1.5
Journal of Documentation	31	1.5
Communications of the ACM	28	1.4
SRELS Journal of Information Management	27	1.3
Legal Information Management	23	1.1
ASLIB Proceedings	21	1.0
Information Resources Management Journal	20	1.0

The relatedness of IM to KM was also shown in the analysis of the journals that publish IM and KM literature. Although the sharing of journals by IM and KM was expected, as the two concepts were examined in the context of the broader field of LIS, the analysis of the journals through which IM and KM research is disseminated can provide valuable information about the relatedness of concepts covered therein. In the current study, IM and KM literature was covered in a total of 430 journals, 213 of which covered both concepts. As aforementioned, among the variables investigated in this study, only journals recorded fairly high values of strengths of association and coverage overlap ratio, implying a strong relationship between

IM and KM in terms of the sources that disseminate IM and KM research. An analysis of the author-supplied keywords, too, indicated that the two concepts (i.e. IM and KM) are related, given that 1 463 of the keywords appeared in both IM and KM literature.

Finally, we believe that the following should form an agenda for further research in order to clearly identify how similar and/or different IM is to/from KM:

- An analysis of the full-text articles to generate the most common words within the text;
- A core/periphery model analysis of IM and KM literature (using title words, author-supplied keywords, subject terms and journal title words) to identify the core and peripheral words that are used to describe IM and KM.

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