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### Recommended Citation

Serenko, Alexander and Bontis, Nick, "Exploring the Intellectual Core and Impact of the Knowledge Management and Intellectual Capital Academic Discipline" (2012). *AMCIS 2012 Proceedings*. 3.  
<http://aisel.aisnet.org/amcis2012/proceedings/PerspectivesIS/3>

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# Exploring the Intellectual Core and Impact of the Knowledge Management and Intellectual Capital Academic Discipline

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## ABSTRACT

The purpose of this study is to explore the intellectual core of the knowledge management and intellectual capital (KM/IC) academic discipline by analyzing cited and citing sources of the exemplary articles published in *Journal of Knowledge Management* and *Journal of Intellectual Capital*. Based on the findings, it is concluded that the KM/IC discipline: 1) builds its knowledge only upon works published in English language; 2) successfully disseminates its knowledge in both English and non-English language works; 3) does not exhibit a problematic self-citation behavior; 4) uses books and practitioner journals in the development of KM/IC theory; 5) converts experiential knowledge into academic knowledge; 6) is not yet a reference discipline, but is progressing well towards becoming one; and 6) exerts a somewhat limited direct impact on practice. Recommendations for various discipline stakeholders are offered.

## Keywords

Knowledge management, intellectual capital, academic research, relevance, reference discipline, citation analysis.

## INTRODUCTION

Science, which originated from the Latin word “scientia,” is a systematic study of the natural world. It includes methods for knowledge creation, the body of knowledge accumulated as a result of the application of these methods, and cultural values and norms that are used to guide scientific inquiries. Scientific studies generate and present knowledge in the form of testable or falsifiable theories, hypotheses and predictions about the phenomenon of interest (Merton and Sztompka, 1996, Merton, 1982). The key motivation of researchers is the pursuit of true knowledge for the sake of knowledge (Mohr, 1977) and the engagement in science for the sake of science (Fuller, 1997). The chronological development of modern science dates back to Ancient Greece, Rome, Byzantium, Renaissance, and the Industrial Revolution centered in the seventeenth century. Several isolated civilizations also followed a scientific path. Examples include the development of science in China, Babylonian mathematics and Egyptian astronomy (Price, 1961).

As modern science advanced, different branches, also referred to as fields, disciplines or domains, of science appeared. The two general groups include natural sciences, which focus on natural-world phenomena, for instance, astronomy, physics, biology and chemistry, and social sciences, which investigate the behavior of people, organizations and societies. In addition, there are several interdisciplinary fields, for example, women studies and criminology. Each scholarly discipline has two objectives. The first is to accumulate the body of knowledge and document it in the form of scientific publications appearing in peer-reviewed journals, conference proceedings, books, etc. The ultimate goal of most scholarly fields is to become a reference discipline, which provides a theoretical, conceptual and methodological foundation for other scientific disciplines. The second purpose is to make an impact on the state of practice, not only to advance our understanding of the phenomena but also to ensure the practical application of the findings, and to improve people’s quality of life.

Knowledge management and intellectual capital (KM/IC) is perhaps one of the youngest scientific disciplines that emerged less than two decades ago. On the one hand, it already has its own peer-reviewed journals, leading scholars (Gu, 2004), research cooperation networks (Ma and Yu, 2010), academic courses (Ruth et al., 2003), conferences (Serenko et al., 2009), and theories (Grant, 2002), which are considered the necessary attributes of an academic field. On the other hand, the overall direction in which the discipline has been developing is not fully understood (Sagsan, 2009). Has the KM/IC field been

progressing towards becoming a reference discipline? Does it exhibit signs of academic maturity? What is its intellectual core? More research is needed to answer these critical questions (Grant, 2011, Lambe, 2011).

In addition, the KM/IC field was initially founded on the works of business practitioners who developed and applied first KM/IC concepts in organizational settings. However, there are arguments that the practical impact of the KM/IC field has not met the expectations of industry professionals, and the entire domain has shifted its focus from solving practical problems to pure theory with limited applications (Booker et al., 2008).

Therefore, the purpose of the present study is two-fold. The first is to investigate the intellectual core of the KM/IC discipline to understand whether it may be considered (or moving towards becoming) a reference discipline. The second goal is to explore the practical impact of KM/IC. In order to answer these critical questions, citation analysis of the exemplary articles published in two top-tier KM/IC journals, *Journal of Knowledge Management* and *Journal of Intellectual Capital*, was done.

## LITERATURE REVIEW

### What is a Reference Discipline?

*“Pathbreaking ideas within any specialty usually come from cross-referencing ideas from other specialties or disciplines rather than from research that is narrowly focused within the specialty”* (Turner, 1990, p. 672).

There are several signs of academic maturity of a scientific discipline: an established set of journals, settled academic meetings, distinct subject matter, major scholars, growing body of knowledge, recognized learned societies or active special interest groups (SIGs) within societies, well-developed networking channels, place in academic curricula, recognition of scholarly output value and impact on other disciplines (Baskerville and Myers, 2002, Jennex and Croasdell, 2005). Particularly, many mature disciplines eventually become a reference discipline because they provide theoretical and methodological foundation for other disciplines and are heavily cited by other disciplines (Wade et al., 2006). In fact, becoming a reference discipline is an ultimate goal of most scientific domains.

The idea of relying on works of previous scientists as a starting point of one’s own research dates back to the seventeenth century when Isaac Newton described himself as “standing on the shoulders of the giants who have gone before” (Merton, 1993, p. 8). There are several pros of relying on the knowledge in reference disciplines (Avison and Elliot, 2006, Baskerville and Myers, 2002, Truex et al., 2006). First, by borrowing established theories, researchers may form a sound understanding of relevant literature and successfully adapt it in a new domain instead of re-inventing the wheel. Second, it is wise to apply previously validated scientific methods from well-established scientific domains to demonstrate the new field’s rigor and ensure its scholarly recognition. Third, a receiving discipline may improve the theories and methods that were initially invented in other domains and return this enhanced knowledge back. In fact, every new discipline has a moral obligation to eventually contribute something back to the fields which knowledge it built upon. Fourth, by borrowing knowledge from other areas, a receiving discipline may potentially attract scholars from other fields to a new domain and create opportunities for inter-disciplinary collaboration.

The best approach to explore the intellectual core and impact of a reference discipline is to analyze citation patterns by using a set of major journal articles in the field under investigation (Katerattanakul et al., 2006, Taneja et al., 2009). Figure 1 outlines relationships among academic disciplines as defined by journal citations. It illustrates that Discipline B is a reference discipline for Discipline C. At the same time, it is a receiving discipline from the Discipline A’s perspective (i.e., Discipline A is a reference discipline for Discipline B). Therefore, a domain may be a reference discipline (A), both a reference and receiving discipline (B), or a receiving discipline (C).

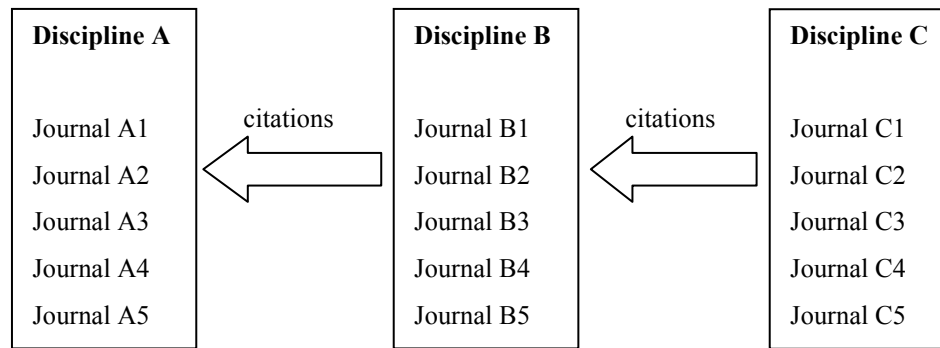


Figure 1. Relationships among Academic Disciplines as Defined by Journal Citations (adapted from Wade et al. (2006))

### Current State of the KM/IC Discipline

As a distinct scientific discipline, KM/IC emerged in response to the increasing pressure on private and public organizations to improve their efficiency. It had long historical roots because people have been preserving and managing knowledge for thousands of years. It was initially considered an applied field, which had no academic presence. However, a discipline cannot solely rest on its practical foundations, and Stewart (1991) published a seminal article in the *Fortune Magazine* on the importance of intellectual capital management. After Senge (1990) published a book on organizational learning, the *Learning Organization* journal was launched in 1994. *Journal of Knowledge Management*, which is considered a top KM/IC journal (Bontis and Serenko, 2009), was launched in 1997. Same year, *Knowledge and Process Management* journal changed its name from *Business Change and Re-engineering*. Practitioners who pioneered the KM/IC field started publishing not only books targeted at other practitioners but also articles in peer-reviewed journals, and the field has started attracting the attention of new and well-established academics. Overall, the field has been steadily progressing towards academic recognition. In order to ensure the future success of the field, it is critical to study upon which disciplines it draws knowledge (i.e., whether KM/IC is a receiving discipline), and which disciplines it influences (i.e., whether KM/IC is a reference discipline).

At the same time, it is critical to remember that KM/IC is an applied discipline which is supposed to have a practical impact. It should produce knowledge that is relevant to the needs of managers and that may influence the state of practice (Jennex and Olfman, 2005). When the KM/IC discipline was in its embryonic stage in 1994, non-academics produced 30% of all peer-reviewed KM/IC articles, but by 2009 their output declined to only 10% (Serenko *et al.*, 2010). There are claims that KM/IC practitioners rarely use scientific terminology (Eijkman, 2011) and empirical methods (Andrikopoulos, 2010). Overall, the impact of academic KM/IC research on practice has been questioned (Booker *et al.*, 2008). Therefore, it is vital to study whether the KM/IC body of knowledge is applied in practical settings. This may be also achieved by means of citation analysis. If the KM/IC field has made a practical impact, its exemplary publications should be cited in not only academic but also practitioner sources.

The following two research questions are proposed:

- 1) What is the intellectual core of the KM/IC discipline? Does it exhibit signs of a reference discipline?
- 2) What is the theoretical and practical impact of the KM/IC academic discipline?

In fact, it is critical for researchers to occasionally pause and take a critical look on the development of their discipline (Hassan, 2011).

### METHODOLOGY

In this study, a scientometric analysis of exemplary articles published in *Journal of Knowledge Management* (JKM) and *Journal of Intellectual Capital* (JIC) was done. These journals were chosen for the following reasons. First, they are leading scholarly outlets in the domain, enjoying the A+ ranking (Bontis and Serenko, 2009, Serenko and Bontis, 2009). Second, they have a wide subscription base. For example, in 2011 JKM and JIC articles were downloaded over 344,000 and 126,000 times per year, respectively.<sup>1</sup> Third, they provide a very comprehensive coverage of the scientific domain of interest. Whereas JIC

<sup>1</sup> Personal communication with Rory Chase, *Journal of Knowledge Management* and *Journal of Intellectual Capital* Editor.

focuses on creating, identifying and measuring intellectual capital in organizations, JKM concentrates on the various aspects of intellectual capital management. In other words, both journals complement each other.

The use of exemplar articles is a recognized technique in citation analysis (van Zeebroeck et al., 2008). In each journal, all articles included in its h-index on May 1, 2011 were selected based on Google Scholar by means of the Harzing's Publish or Perish tool. Google Scholar was chosen because it includes journal articles, books, book chapters, conference proceedings, professional magazines, patents and industry reports, and covers publications in multiple languages. The h-index, introduced by Hirsch (2005), is a measure of scientific impact of individuals, journals and institutions. With respect to journals, h-index states that a journal has index  $h$  if  $h$  of its  $Np$  articles have at least  $h$  citations each and the other  $(Np - h)$  articles have fewer than  $h$  citations each. The key benefit of the h-index is that it can differentiate between journals generating most of their citations from only a few articles, and those producing well-cited works relatively consistently. It is also a very useful tool in journal ranking development (Moussa and Touzani, 2010). Articles included in the journal's h-index are usually considered the most significant works appearing in this outlet.

The following steps were followed to obtain and analyze the data:

- 1) All articles included in the h-index of JKM and JIC were selected.
- 2) A manual analysis of the h-index articles was done and appropriate adjustments were made.
- 3) A list of citing (i.e., publications that cited the examined JKM and JIC articles) and cited (i.e., references in the examined JKM and JIC articles) works was created for JKM and JIC separately (see Table 1).
- 4) Language (e.g., English, German, French, etc.) of each citing and cited work was identified.
- 5) For citing and cited works, three categories of self-citations were identified: author self-citations; journal self-citations; and joint author and journal self-citations.
- 6) For JKM and JIC separately, categories of citing and cited works (e.g., peer-reviewed journal, thesis, peer-reviewed conference proceedings, book chapter, practitioner journal/magazine, etc.) were identified.
- 7) For citing and cited peer-reviewed journals, the journal's field of research (e.g., accounting, marketing, etc.) was recorded by adapting the classification of the Excellence in Research for Australia Initiative<sup>2</sup>.
- 8) From the list of citing and cited peer-reviewed journals, all KM/IC journals appearing in the list of Bontis and Serenko (2009) were excluded. From each of the remaining sets, 200 entries were randomly selected. Each selected paper was analyzed to determine whether the topic of the study pertained to KM/IC.

	<b>h-index</b>	<b>Total # of Citing Works</b>	<b>Total # of Cited Works</b>
Journal of Knowledge Management	63	5,939	2,057
Journal of Intellectual Capital	40	3,328	1,442

**Table 1. Summary of Citing and Cited Works – JKM and JIC**

## RESULTS

Table 2 outlines the language of citing and cited works. It reveals that citing works were published not only in English but also in other languages, with Chinese being the leader. In contrast, very few JKM and JIC articles cited non-English sources. JIC's articles were cited more often in languages other than English.

<sup>2</sup> <http://www.arc.gov.au/era/default.htm>.

Citing Works					
JKM			JIC		
Language	Number	%	Language	Number	%
English	5,206	87.66	English	2,672	80.29
Chinese	208	3.50	Chinese	247	7.42
Portuguese	149	2.51	Portuguese	145	4.36
German	131	2.21	Spanish	108	3.25
Spanish	92	1.55	German	54	1.62
French	47	0.79	French	20	0.60
Korean	22	0.37	Italian	14	0.42
Italian	18	0.30	Russian	14	0.42
Other (Swedish, Turkish, Dutch, Finnish, Polish, etc.)	66	1.11	Other (Korean, Slovenian, Polish, Swedish, etc.)	54	1.62
Total	5,939	100.00	Total	3,328	100.00
Cited Works					
JKM			JIC		
Language	Number	%	Language	Number	%
English	1,996	97.03	English	1,424	98.75
Other (German, Dutch, Swedish, French, etc.)	61	2.97	Other (German, Dutch, Swedish, etc.)	18	1.25
Total	2,057	100.00	Total	1,442	100.00

Table 2. Language of Citing and Cited Works

Table 3 presents self-citation patterns. It shows that JIC has a higher self-citation rate than JKM. This is because more journals concentrate on KM than IC issues; therefore, JIC authors have to cite their own works and works appearing in JIC more often. However, the observed self-citation rates are low which demonstrates that the discipline does not exhibit a problematic self-citation behavior.

	Citing Works		Cited Works	
	JKM	JIC	JKM	JIC
Author self-citations	85 (1.43%)	185 (5.56%)	115 (5.59%)	124 (8.60%)
Journal self-citations	309 (5.20%)	350 (10.52%)	65 (3.16%)	67 (4.65%)
Joint author & journal self-citations	6 (0.10%)	37 (1.11%)	8 (0.39%)	4 (0.28%)

Table 3. Self-Citation Behavior

Table 4 and Table 5 show categories of citing works for JKM and JIC, respectively, and Table 6 and Table 7 present the same numbers for cited works. First, theses, dissertations, and master's or undergraduate projects, which represent indicators of scientific growth (Andersen and Hammarfelt, 2011), constitute over 15% of all citing sources. Therefore, the KM/IC discipline is in the phase of academic expansion. Second, despite some minor differences, JKM and JIC exhibited a similar pattern with respect to citing and cited sources. Third, JKM and JIC articles use non-refereed sources to a great extent (see Table 8). At the same time, they also contribute to the state of practice, even though to a lesser extent. In other words, the KM/IC academic literature borrows ideas, examples, cases, concepts, etc. from the professional literature, uses them to extend the theoretical body of knowledge, and feeds this knowledge into both into peer-reviewed literature and, to a lesser degree, into practice. Particularly, practitioner journals/magazines constitute 15% and 5% of cited and citing works, respectively.

Categories of Citing Works	Number	%
Peer-reviewed journals	2,588	43.58
Theses, dissertations, master's or undergraduate research projects	1,008	16.97
Peer-reviewed conference proceedings	921	15.51
Book chapters	484	8.15
Practitioner journals/magazines	298	5.02
Working papers	288	4.85
Books	258	4.34
Technical & business reports	51	0.86
Online multimedia (e.g., news broadcast, presentation, speech)	23	0.39
Government documents	11	0.19
Websites	5	0.08
Case studies	3	0.05
Newspapers	1	0.02
<b>Total</b>	<b>5,939</b>	<b>100.00</b>

Table 4. Categories of Citing Works – JKM

Categories of Citing Works	Number	%
Peer-reviewed journals	1,656	49.76
Theses, dissertations, master's or undergraduate research projects	515	15.47
Peer-reviewed conference proceedings	383	11.51
Working papers	255	7.66
Practitioner journals/magazines	176	5.29
Book chapters	162	4.87
Books	139	4.18
Technical & business reports	29	0.87
Online multimedia (e.g., news broadcast, presentation, speech)	4	0.12
Case studies	3	0.09
Government documents	3	0.09
Dictionaries	1	0.03
Unpublished manuscripts	1	0.03
Websites	1	0.03
<b>Total</b>	<b>3,328</b>	<b>100.00</b>

Table 5. Categories of Citing Works – JIC

Categories of Cited Works	Number	%
Peer-reviewed journals	777	37.77
Books	645	31.36
Practitioner journals/magazines	327	15.90
Book chapters	162	7.88
Peer-reviewed conference proceedings	61	2.97
Websites	40	1.94
Technical & business reports	16	0.78
Working papers	11	0.53
Theses, dissertations, master's or undergraduate research projects	9	0.44
Newspapers	4	0.19
Personal communication	2	0.10
Unpublished manuscripts	2	0.10
Government documents	1	0.05
<b>Total</b>	<b>2,057</b>	<b>100.00</b>

Table 6. Categories of Cited Works – JKM

Categories of Cited Works	Number	%
Peer-reviewed journals	537	37.24
Books	461	31.97
Practitioner journals/magazines	133	9.22
Peer-reviewed conference proceedings	90	6.24
Websites	73	5.06
Book chapters	49	3.40
Technical & business reports	44	3.05
Working papers	20	1.39
Government documents	15	1.04
Newspapers	13	0.90
Theses, dissertations, master's or undergraduate research projects	4	0.28
Interviews	2	0.14
Personal communication	1	0.07
<b>Total</b>	<b>1,442</b>	<b>100.00</b>

Table 7. Categories of Cited Works – JIC

		JKM	JIC
Citing works	Peer-reviewed	67.24%	66.14%
	Non-peer-reviewed	32.76%	33.86%
Cited works	Peer-reviewed	48.62%	46.88%
	Non-peer-reviewed	51.38%	53.13%

Table 8. Summary of Citing and Cited Works – JKM and JIC

Table 9 through Table 12 show journal fields for citing and cited works for JKM and JIC. Table 13 outlines topics of citing and cited peer-reviewed journal articles published in non-KM/IC journals.



<b>Journal's Research Field</b>	<b>Number of Citations</b>	<b>% of Citations</b>
Knowledge Management and Intellectual Capital	803	31.03%
Management Information Systems	340	13.14%
General Management	298	11.51%
Technology and Innovation Management	172	6.65%
Human Resources, Organizational Behavior, Workspace Learning and Workspace Training	157	6.07%
Library and Information Science	145	5.60%
Engineering	80	3.09%
Education	67	2.59%
Operations Management and Management Science	60	2.32%
Multidisciplinary	54	2.09%
Economics	53	2.05%
Health Care	51	1.97%
Tourism, Hospitality and Services Industry Management	48	1.85%
International Business	37	1.43%
Artificial Intelligence	31	1.20%
Public Policy and Administration	29	1.12%
Marketing	28	1.08%
Communication and Media Studies	18	0.70%
Computer Science, Computer Software and Computer Hardware	18	0.70%
Sociology, Philosophy and History	18	0.70%
Psychology	13	0.50%
Entrepreneurship	12	0.46%
Accounting	11	0.43%
Social Work	10	0.39%
Linguistics, Literary Studies and Journalism	8	0.31%
Architecture	6	0.23%
Biology	4	0.15%
Agriculture	3	0.12%
Criminology and Law	3	0.12%
Technology	3	0.12%
Business Ethics	2	0.08%
Business Strategy	2	0.08%
Political Science	2	0.08%
Finance	1	0.04%
Geography	1	0.04%

**Table 9. Journal Fields for Citing Peer-Reviewed Journals – JKM**

<b>Journal's Research Field</b>	<b>Number of Citations</b>	<b>% of Citations</b>
Knowledge Management and Intellectual Capital	716	43.29%
Accounting	223	13.48%
General Management	202	12.21%
Technology and Innovation Management	77	4.66%
Human Resources, Organizational Behavior, Workspace Learning and Workspace Training	55	3.33%
Operations Management and Management Science	50	3.02%
Management Information Systems	42	2.54%
Economics	36	2.18%
Multidisciplinary	34	2.06%
Tourism, Hospitality and Services Industry Management	32	1.93%
Public Policy and Administration	29	1.75%
Education	17	1.03%
Engineering	16	0.97%
Entrepreneurship	16	0.97%
Library and Information Science	15	0.91%
Artificial Intelligence	13	0.79%
Sociology, Philosophy and History	13	0.79%
Technology	10	0.60%
Marketing	9	0.54%
Finance	8	0.48%
Business Ethics	7	0.42%
International Business	7	0.42%
Psychology	6	0.36%
Communication and Media Studies	5	0.30%
Computer Science, Computer Software and Computer Hardware	5	0.30%
Agriculture	4	0.24%
Health Care	4	0.24%
Architecture	2	0.12%
Business Strategy	1	0.06%

**Table 10. Journal Fields for Citing Peer-Reviewed Journals – JIC**

<b>Journal's Research Field</b>	<b>Number of Citations</b>	<b>% of Citations</b>
General Management	292	36.82%
Knowledge Management and Intellectual Capital	99	12.48%
Management Information Systems	53	6.68%
Operations Management and Management Science	52	6.56%
Business Strategy	51	6.43%
Human Resources, Organizational Behavior, Workspace Learning and Workspace Training	50	6.31%
Marketing	37	4.67%
Technology and Innovation Management	25	3.15%
Library and Information Science	21	2.65%
Sociology, Philosophy and History	19	2.40%
Artificial Intelligence	11	1.39%
Economics	11	1.39%
Communication and Media Studies	10	1.26%
Education	9	1.13%
International Business	8	1.01%
Physics	8	1.01%
Psychology	8	1.01%
Multidisciplinary	6	0.76%
Entrepreneurship	5	0.63%
Accounting	4	0.50%
Engineering	4	0.50%
Computer Science, Computer Software and Computer Hardware	3	0.38%
Public Policy and Administration	3	0.38%
Health Care	2	0.25%
Linguistics, Literary Studies and Journalism	1	0.13%
Tourism, Hospitality and Services Industry Management	1	0.13%

**Table 11. Journal Fields for Cited Peer-Reviewed Journals – JKM**

Journal's Research Field	Number of Citations	% of Citations
Accounting	135	25.05%
General Management	122	22.63%
Knowledge Management and Intellectual Capital	80	14.84%
Business Strategy	50	9.28%
Technology and Innovation Management	35	6.49%
Operations Management and Management Science	31	5.75%
Marketing	27	5.01%
Economics	15	2.78%
Finance	12	2.23%
Human Resources, Organizational Behavior, Workspace Learning and Workspace Training	7	1.30%
Management Information Systems	7	1.30%
Sociology, Philosophy and History	4	0.74%
Engineering	3	0.56%
Multidisciplinary	3	0.56%
Business Ethics	2	0.37%
International Business	2	0.37%
Artificial Intelligence	1	0.19%
Health Care	1	0.19%
Psychology	1	0.19%
Public Policy and Administration	1	0.19%

**Table 12. Journal Fields for Cited Peer-Reviewed Journals – JIC**

		JKM	JIC
Citing works	KM/IC	70%	80%
	Non-KM/IC	30%	20%
Cited works	KM/IC	57%	48%
	Non-KM/IC	43%	52%

**Table 13. Topics of Citing and Cited Peer-Reviewed Journal Articles (excluding KM/IC journals) – JKM and JIC**

The findings above are summarized in a framework describing the intellectual core and impact of the KM/IC discipline (see Figure 2 – JKM and Figure 3 – JIC).

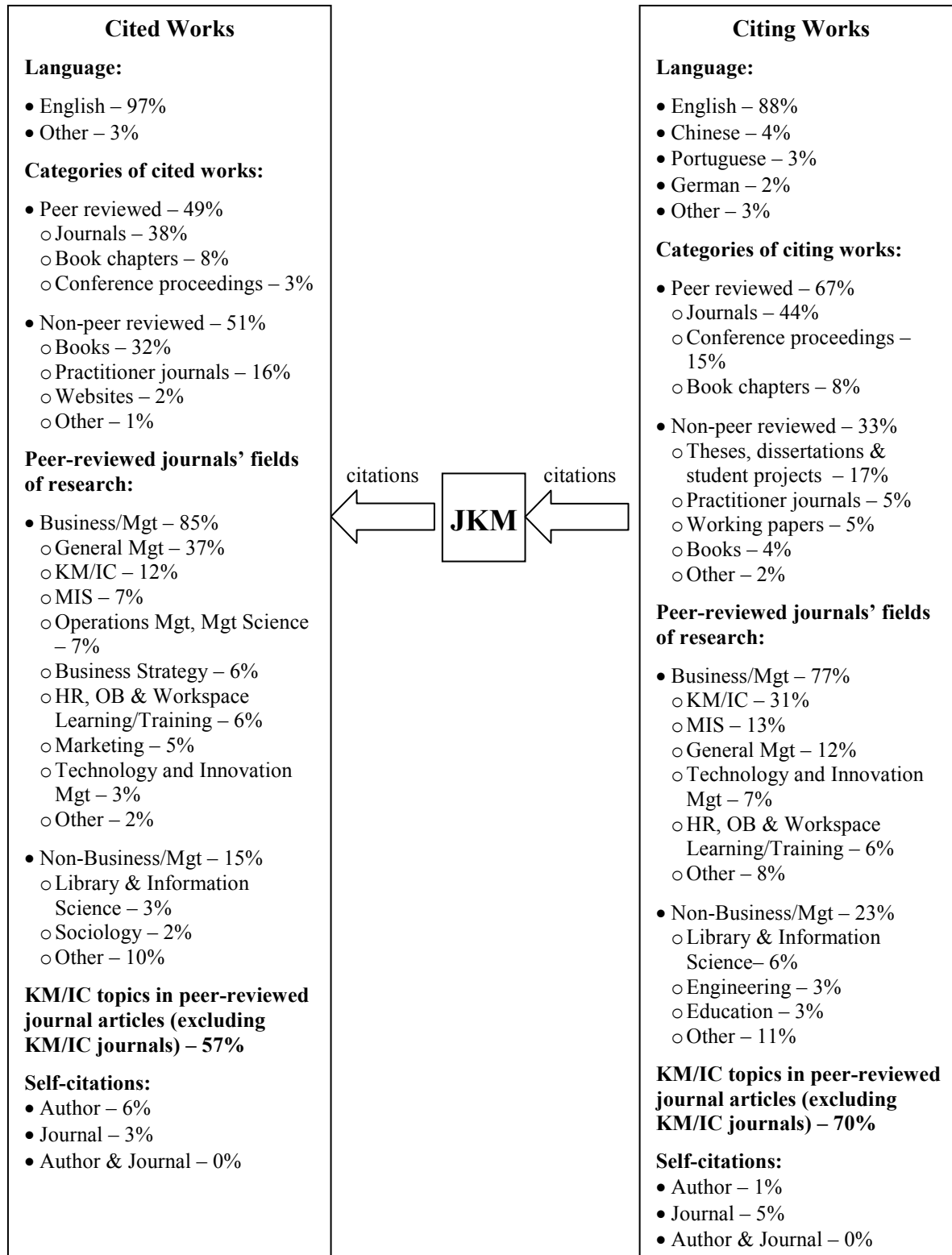


Figure 2. Intellectual Core and Impact of the KM/IC Discipline - JKM

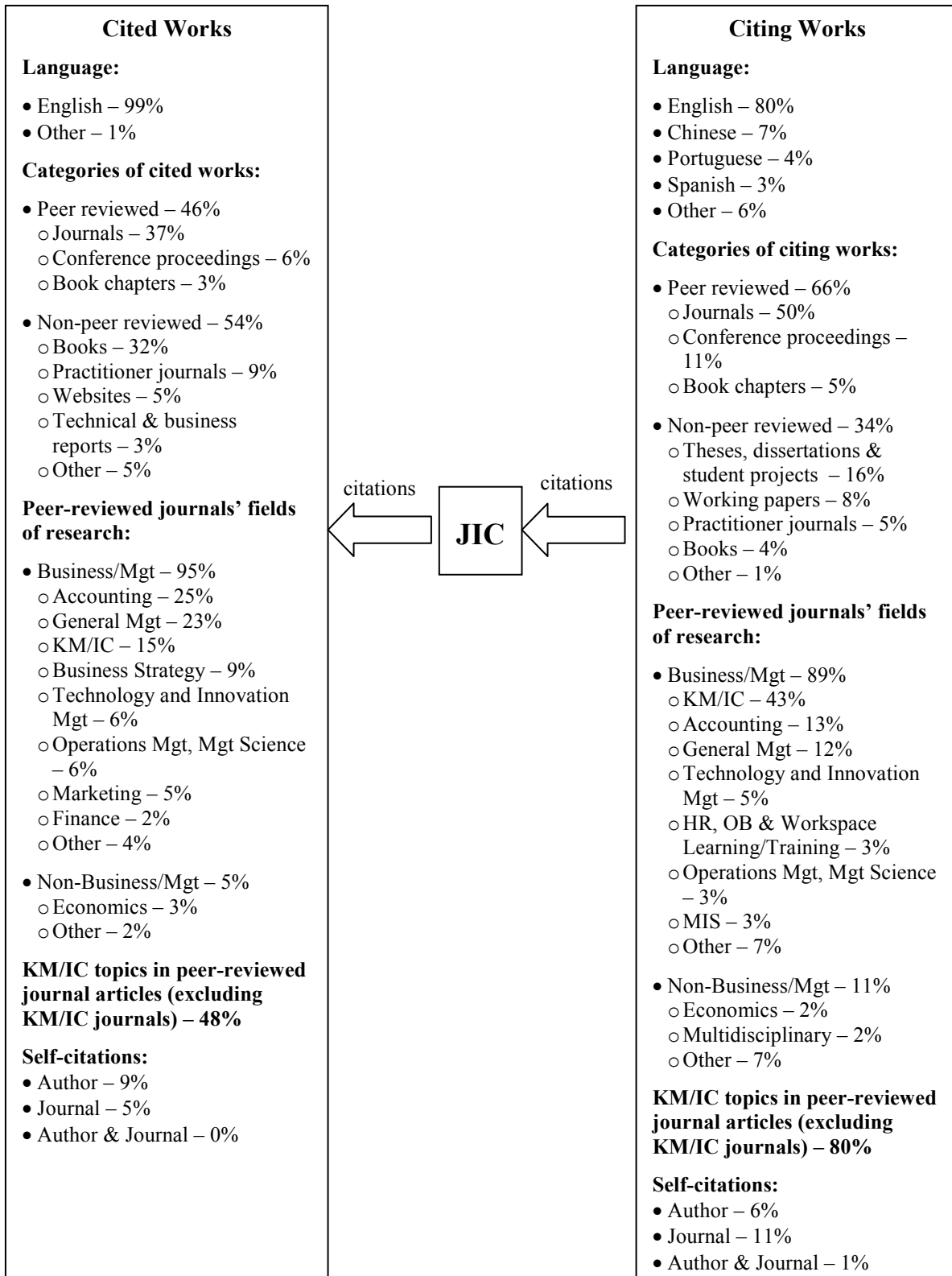


Figure 3. Intellectual Core and Impact of the KM/IC Discipline - JIC

## IMPLICATIONS

The purpose of this study was to empirically investigate the intellectual core and impact of the KM/IC discipline. For this, 63 and 40 articles included in the h-index of JKM and JIC were subjected to scientometric analysis by analyzing their cited and citing works. Based on the findings, seven important implications emerged that warrant discussion:

*Implication #1: The KM/IC discipline builds its knowledge only upon works published in English language.*

As demonstrated in Table 2, exemplar JKM and JIC articles cite only English-language sources. This observation is somewhat disappointing since a major part of KM/IC research is conducted in non-English speaking countries (Serenko *et al.*, 2010), which have national publications that may serve well the scientific community.

*Implication #2: The KM/IC discipline successfully disseminates its knowledge in both English and non-English language works.*

12% of JKM and 20% JIC major articles were cited in non-English language sources (see Table 2). This observation is very encouraging since it shows that: 1) KM/IC research has an impact beyond the English-speaking academic world; and 2) many non-English language nations are interested in KM/IC research and make use of it.

*Implication #3: The KM/IC discipline does not exhibit a problematic self-citation behavior.*

Author self-citations, when the researcher cites his or her own previous works, are an acceptable and often necessary academic practice. Journal self-citations, when the paper published in a journal cites works earlier published in the same outlet, are also considered a norm. However, excessive self-citations are dangerous because they may bias bibliometric indices, inflate author or journal rankings, and misdirect the development of the entire scientific domain. In some extreme cases, journal editors force authors to cite their journal as a condition for final paper acceptance after the formal review process (Bjørn-Andersen and Sarker, 2009). Fortunately, the rate of self-citations in JKM and JIC is within an acceptable range. To the best knowledge of the authors, no reports of forced citations were ever reported by KM/IC researchers. JIC has a higher journal self-citation rate than JKM because there are more KM than IC journals, and KM journals appeared before IC journals, which gives the authors of KM papers more outlets to choose from.

*Implication #4: Books and practitioner journals play an important role in the development of KM/IC theory.*

Books and practitioner journals are a key source of ideas, examples, and content for the development of KM/IC theory. This finding is consistent with Serenko *et al.* (2012) who report that references from books constitute 45% and 30% of all references in authored and edited KM/IC books, respectively. They also demonstrate that references from practitioner magazines represent almost 20% of all KM/IC book citations. In this study, books and practitioner journals constituted 32% and 12% of all cited sources, respectively, which highlights their importance in the establishment of the KM/IC field.

*Implication #5: The KM/IC discipline converts experiential knowledge into academic knowledge.*

Approximately one-half of the knowledge in the JKM and JIC exemplar articles is built upon non-peer reviewed sources, which reflect experiential knowledge. Experiential knowledge, defined as knowledge based on practical experience in the field which is stored in the wisdom of practitioners and documented in non-peer reviewed sources, has a direct relevance to practice (March and Augier, 2007). Academic knowledge, which is derived from scholarship, created in the scholarly environment, and preserved in peer-reviewed publications, has a direct scholarly relevance. The key achievement of the KM/IC discipline is that it uses experiential knowledge as a key input, embeds it in theory, and converts it into academic knowledge that may be used by both academics and industry practitioners.

*Implication #6: KM/IC is not yet a reference discipline, but it is progressing well towards becoming one.*

A reference discipline is an academic field that has made a strong theoretical and/or methodological impact on other scientific fields. For JKM, the findings indicate that KM/IC topics in peer-reviewed journal articles (excluding KM/IC journals) constitute 57% and 70% of cited and citing works. The respective numbers for JIC are 48% and 80%. Therefore, both JKM and JIC borrow more knowledge from other (i.e., non-KM/IC) disciplines than they infuse in other domains. The KM/IC discipline takes ideas from other business fields, mostly from general management, accounting, MIS and business strategy, uses them to advance KM/IC theory and methodology, but keeps most of this knowledge within its own boundaries.

However, there are signs that KM/IC is progressing well towards academic impact and recognition. First, it is a positive sign for a young discipline to capitalize on the knowledge existing elsewhere, instead of 're-inventing the wheel,' repeating documented mistakes, wasting researchers' time, and misdirecting practitioners. Second, despite its youth, KM/IC has already exerted some influence on other fields since around 25% of all citations (i.e., 30% for JKM and 20% for JIC) came from non-KM/IC papers published in non-KM/IC peer-reviewed journals. Third, 23% and 11% of all citations to JKM and

JIC articles, respectively, came from non-business journals, which demonstrates the dissemination of knowledge far beyond the management domain.

*Implication #7: The direct impact on practice of the KM/IC discipline is somewhat limited, but it is expected to increase in the future.*

There are many ways in which a scientific discipline can impact the state of practice. One of them is the transition of scholarly knowledge published in peer-reviewed journals to non-academic works, particularly to government documents, patents, practitioner magazines, technical & business reports, case studies, news broadcasts, speeches, and newspapers, which is revealed in peer-reviewed articles' citation patterns. Citations from these major practitioner sources represented only 6.6% and 6.5% of all citations to the exemplar JKM and JIC peer-reviewed articles, respectively. On the one hand, this number is relatively small; on the other hand, the KM/IC discipline has made some practical impact. It is expected that as the overall number of KM/IC citations grows, so will the overall number of citations from professional sources, increasing the cumulative impact of the discipline on practice. In fact, one cannot expect peer-reviewed publications to be cited predominantly in practitioner works, and the finding that KM/IC articles are cited in practitioner sources is encouraging.

## RECOMMENDATIONS AND CONCLUSION

Based on the implications above, several recommendations are offered:

First, the KM/IC researchers need to become aware of and use knowledge published in non-English language. The KM/IC discipline has been relatively successful in disseminating its works into non-English sources. At the same time, ignoring the non-English body of knowledge impedes the discipline's progress. Traditionally, English has been an official language of science; this, approach, however, may not serve science well in the long-run.

Second, even though self-citations do not exhibit the signs of problematic behavior, KM/IC stakeholders should be aware of potential danger of extreme self-citations or forced citations. In many cases, self-citations are necessary and encouraged, especially when the researchers extend their previous lines of work. Forced citations, however, are misleading, unethical, and harmful to the overall process of scientific discovery and should be constantly monitored by the research community.

Third, given the status of KM/IC of an applied discipline, it is critical that researchers continue utilizing non-peer reviewed sources in their scholarly work. For example, professional magazines and technical reports may serve as a repository of examples and cases that may be included in academic work. Most importantly, professional outlets may identify emerging issues, topics in need of investigation, and research ideas, which may inspire academics to embark on studies of not only theoretical but also practical importance. In addition, academics should become active participants in the dissemination of scholarly knowledge they create and/or possess. For this, multiple avenues may be followed. For instance, they may publish in practitioner magazines, give talks at non-academic meetings, maintain personal websites with summaries of their work, send their publications to relevant professional associations, and engage in consulting.

Fourth, KM/IC researchers should promote the dissemination of KM/IC knowledge beyond the disciplinary boundaries. For example, they may engage in inter-disciplinary projects, publish their papers in non-KM/IC journals, and inform their departmental and institutional colleagues about their work. Journal editors should target their journals not only at KM/IC readers, but also at researchers from the reference and receiving disciplines, especially from general management, accounting, management information systems, human resources management, organizational behavior, business strategy, marketing, and library & information science.

Last, the issue whether KM/IC should strive towards becoming a reference discipline should be debated further. In contrast to the traditional scholarly domains (e.g., pure sciences) based on the scientific model of knowledge discovery, KM/IC is a professional discipline that was created in practical settings. It is possible that to become a 'real' and 'recognized' scholarly domain it does not need to be considered a reference discipline. Instead of disseminating its knowledge to other business and non-business fields, KM/IC may gain legitimacy by focusing on basic and applied research inspired by the needs of end knowledge users (Stokes, 1997). This is a critical issue that KM/IC journal editors, board members, reviewers and granting agencies need to consider to establish the desired direction of KM/IC discipline development.

To the best knowledge of the authors, this study is the first documented attempt to empirically explore the intellectual core of the KM/IC discipline from the reference discipline perspective. It presents a number of recommendations for discipline stakeholders and calls for future scientometric research in the KM/IC field.



## ACKNOWLEDGMENTS

This study is kindly supported by the research grant 864-07-0181 from the Social Sciences and Humanities Research Council of Canada (SSHRC).

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