The intellectual core and impact of the knowledge management academic discipline

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Abstract

Purpose – *The purpose of this paper is two-fold: to explore the intellectual core of the knowledge management (KM) academic discipline in order to test whether it exhibits signs of a reference discipline; and to analyze the theoretical and practical impact of the discipline.*

Design/methodology/approach – *The most influential articles published in the* Journal of Knowledge Management *were selected and their cited and citing works were scientometrically analysed.*

Findings – *The KM discipline: builds its knowledge primarily upon research reports published in the English language; successfully disseminates its knowledge in both English and non-English publications; does not exhibit a problematic self-citation behavior; uses books and practitioner journals in the development of KM theory; converts experiential knowledge into academic knowledge; is not yet a reference discipline, but is progressing well towards becoming one; exerts a somewhat limited direct impact on practice; and is not a scientific fad.*

Practical implications – *KM researchers need to become aware of and use knowledge published in non-English outlets. Given the status of KM as an applied discipline, it is critical that researchers continue utilizing non-peer reviewed sources in their scholarly work. KM researchers should promote the dissemination of KM knowledge beyond the disciplinary boundaries. The issue whether KM should strive towards becoming a reference discipline should be debated further.*

Originality/value – *This study analyzes the KM field from the reference discipline perspective.*

Keywords *Knowledge management, Research work, Languages, Books, Journals, Academic research, Citation analysis, Reference discipline, Relevance, Scientometrics*

Paper type *Research paper*

1. Introduction

Science is a systematic study of the natural world. It encompasses methods for knowledge creation, the body of knowledge accumulated from applying these methods, and the cultural values and norms that 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, 1982; Merton and Sztompka, 1996). 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 development of modern science dates back to Ancient Greece, Rome, Byzantium, Renaissance, and the Industrial Revolution during 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 of science appeared, also referred to as fields, disciplines or domains. Each scholarly discipline has two objectives. The first is to advance our understanding of the phenomena, accumulate the body of knowledge, and document it in the form of scientific publications 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 improve the state of practice, ensure practical application of academic findings, and increase quality of life.

Knowledge management (KM) is a young discipline, having emerged less than two decades ago. KM is multi-disciplinary in nature. It builds its theoretical core on knowledge from various fields, including information technology, organizational science, and cognitive science (Dalkir, 2005). On the one hand, it already has its own peer-reviewed journals (Bontis and Serenko, 2009), leading scholars (Gu, 2004; Serenko and Bontis, 2004), research cooperation networks (Dattero, 2006; Ma and Yu, 2010), academic courses (Ruth *et al.*, 1999, 2003; Al-Hawamdeh, 2005; Bontis *et al.*, 2006), conferences (Serenko *et al.*, 2009), and theories (Grant, 2002). These characteristics are considered the necessary attributes of an academic field. On the other hand, the trajectory of the KM field is not fully understood (Sagsan, 2009). Is it progressing towards becoming a reference discipline providing a theoretical, conceptual and methodological foundation for other scientific disciplines? Does it exhibit signs of academic maturity? What is its intellectual core? Is it a scientific fad? There have been calls to answer these critical questions (Grant, 2011; Lambe, 2011), but more research is needed.

The KM field grew from the work of business practitioners who developed and applied the first KM concepts in organizational settings. However, it is possible that academic KM research 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).

The purpose of the present study is two-fold. The first is to investigate the intellectual core of the KM discipline in order to understand whether it has become (or is moving towards becoming) a reference discipline. The second goal is to examine the practical impact of KM research. To answer these critical questions, a scientometric analysis of the most influential articles published in the top KM journal, the *Journal of Knowledge Management*, was done.

2. Literature review

The purpose of this section is to examine the evolution of scientific disciplines, define a reference discipline, explore the historical trajectory of the KM field, and describe this study's objective.

2.1 What is a scientific discipline?

While humans have produced and preserved knowledge for thousands of years, formal scientific disciplines appeared only two centuries ago. Scientific disciplines serve as a primary unit of the differentiation of science for the purpose of knowledge creation and dissemination. They allow classifying scholarly units in relation to one another, and, if necessary, disqualifying and invalidating them (Foucault, 1977). Scientific disciplines may be differentiated based on the 5W questions (Szostak, 2004): who (i.e. who do scientists study?); what (i.e. what phenomena do they investigate?); where (i.e. where do scientists conduct their investigation?); when (i.e. when do scientists conduct their investigation?); and why (i.e. why do scientists conduct their investigation?) Disciplines may be classified into four general domains: hard-pure (i.e. pure sciences such as biology); soft-pure (i.e. humanities such as history, and pure social sciences such as anthropology); hard-applied (i.e. technologies such as mechanical engineering); and soft-applied (i.e. applied social and administrative sciences, such as education and management) (Becher, 1994). This classification is reflected in and strengthened by the departmental structure of educational and research institutions (Abbott, 2001).

Scientific disciplines serve several critical functions (Messer-Davidow *et al.*, 1993). First, disciplines allow scholars to define the objects, artifacts, and phenomena to be studied and to establish the scientific approaches, methods, and techniques. Second, disciplines produce dedicated academic and practitioner experts in narrow domains of science. Academics are scholars who are committed to advancing the field through theory

development (Jenkins, 1996; Becher and Trowler, 2001), whereas practitioners are experts who apply scientific knowledge in practical settings.

Third, disciplines generate knowledge which is primarily organized, exercised and preserved in written form (Hoskin, 1992). Fourth, they invent new economic worlds. For example, they create markets for books, encyclopedias, articles and proceedings, develop need for scholarly events, such as conferences, symposia and workshops, secure funding for research and graduate student support, and provide jobs for faculty and staff. Disciplines develop and regulate markets between producers and consumers of knowledge. The world of academia is often referred to as a prestige economy because scholars are rarely motivated by extrinsic rewards. Instead, they are looking for recognition of their scientific merit within their own domain of expertise (Blackmore and Kandiko, 2011). Each discipline develops and enforces its own classification of a research amateur, expert or star. Fifth, disciplines define the infrastructure required for their existence, such as material resources, facilities, and administrative support (Fuller, 1993). Sixth, disciplines impact the national and global economic well-being. Empirical evidence suggests that the overall research output (e.g. number of articles published) and research impact (e.g. citation count) positively correlate with the economic wealth of a nation (Rousseau and Rousseau, 1998; King, 2004). As such, ''rich countries are richer in knowledge and manage it more efficiently than poor countries'' (Ruiz *et al.*, 2011, p. 260).

There are two opposing views regarding how scientific disciplines are formed. Internalist accounts argue that disciplines are not purposely created, but that they form naturally from certain types of research activities due to the theory-dominated view of science, discovery and truth. In contrast, the externalist perspective posits that disciplinary dynamics are political, and individuals, organizations or public bodies who provide financial resources establish, control and direct scientific fields (Lenoir, 1993).

Disciplines are subject to change (Klein, 1993; Abbott, 2001). First, they transform internally when new schools of thought or methods appear (Kuhn, 1962). For instance, up to 80 percent of all conclusions published in the medical field are later refuted in subsequent investigations (Ioannidis, 2005). Second, disciplines shift and change their boundaries when knowledge from one discipline overlaps with another discipline (Turner, 1990).

When a new discipline is in the process of initial formation, it is usually composed of experts from a variety of well-recognized disciplines. For example, when biochemistry was being established as a distinct field of science about one hundred years ago, it attracted specialists from pharmacology, physiological, organic and pathological chemistry, experimental zoology, immunology, and hygiene who focused their attention on a theory of enzyme (Kohler, 1982). The core of a discipline is not a commitment to a rigid theoretical perspective or research agenda; instead, the discipline represents a cluster of inter-connected propositions, methods and solutions that take their roots in different contexts and which were cultivated earlier.

The desire to understand the development of science dates back for over 2,000 years starting with the early Greeks. The interest in science classification strengthened during the nineteenth century and is well-documented in the works of Charles S. Peirce who argued that the ''primary purpose in developing a classification of the sciences was to display a given science in relation to other sciences in order to exhibit its conceivable effects'' (Kent, 1987, p. 54). Scientific domains may form three types of mutually non-exclusive relationships (Szostak, 2004). First, they may overlap with regards to specific topics or inquiry methods. Second, one discipline may suggest problems that others may solve. Third, one discipline may build on the body of knowledge from another discipline, which is referred to as a ''reference discipline.'' Given the unique nature of the ''prestige economy'' (Blackmore and Kandiko, 2011), both individual scholars and entire disciplines compete with one another for resources, journal space, and recognition. At the same time, competitors consume one another's products since academic publications are usually targeted at other scholars who read, use, improve, cite, and build on one another's works (Lenoir, 1993). In the management

field, however, researchers also consider the practical implications of their research agendas.

2.2 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).

Signs of the academic maturity of a scientific discipline include: an established set of journals, regular academic meetings, distinct subject matter, major scholars, growing body of knowledge, recognized learned societies or special interest groups (SIGs) within societies, well-developed networking channels, placement in academic curricula, recognition of scholarly output, and an impact on other disciplines (Baskerville and Myers, 2002; Jennex and Croasdell, 2005; Katerattanakul *et al.*, 2006). Many mature disciplines eventually become reference disciplines. A reference discipline is a well-established scholarly domain that provides theoretical and methodological foundation for other disciplines (Nambisan, 2003). As a result, its works are frequently cited by other disciplines, referred to as receiving disciplines (Wade *et al.*, 2006). In fact, becoming a reference discipline is the ultimate goal of most scientific domains.

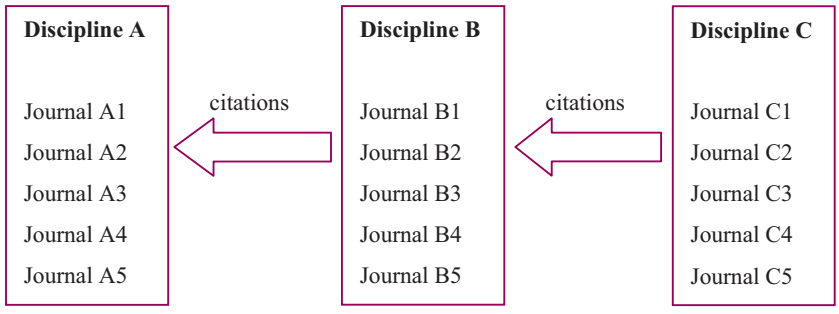
The idea of building on prior research dates back to the seventeenth century when Isaac Newton described himself as ''standing on the shoulders of the giants who have gone before'' (Merton, 1993, p. 8). There are several advantages of using knowledge from reference disciplines (Goul *et al.*, 1992; Baskerville and Myers, 2002; Avison and Elliot, 2006; Truex *et al.*, 2006). First, by reusing established theories, philosophical bases, and assumptions, scholars can accelerate their research in other disciplines. Second, disciplines employing validated scientific methods can improve their own scholarly recognition. Third, a receiving discipline can enrich its theoretical core by simultaneously capitalizing on the knowledge from several reference disciplines. Fourth, a receiving discipline may improve the theories and methods invented in other domains and further disseminate this enhanced knowledge. Fifth, by borrowing knowledge from other areas, a receiving discipline may potentially attract scholars from other fields 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 perspective of Discipline A (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).

There are many advantages of classifying a scientific field from the reference discipline perspective (Szostak, 2003, 2004). First, it allows scholars to establish links between the phenomenon they study and other related fields. It outlines the evolution of their research and offers a useful historical perspective. Second, it encourages a balanced approach to research, teaching, public policy advice, and knowledge transfer. Particularly, it reduces intra-disciplinary biases, encourages inter-disciplinary collaboration, and emphasizes the significance of other domains. Third, the reference discipline approach helps students connect the material within and across courses, and enables new researchers to familiarize themselves with new disciplines. It simplifies the complexity of science, promotes diversity, and shows links between scientific depth and breadth. Most importantly, the reference discipline approach helps scholars understand whether their field is progressing towards academic maturity or it is just a scientific fad that is doomed to vanish.

A scientific fad (Abrahamson, 2009), also referred to as management fad or management fashion (Abrahamson, 1991, 1996; Abrahamson and Fairchild, 1999), appears when a new idea, concept, theory, or school of thought is discovered, gains enthusiastic support among academics, grows exponentially, and eventually becomes dominant. However, scientific

Figure 1 Relationships among academic disciplines as defined by journal citations



Source: Adapted from Wade *et al*. (2006)

fads have short lifespans for a number of reasons (Starbuck, 2009). First, they are based on a mass production view of science according to which most researchers consistently produce high quality output. Scientometric evidence, however, suggests the opposite. A minority of researchers publish most works and attract most citations. For example, in the Management Information Systems discipline in Canada, top ten scholars generate 30 percent of all research output and attract over 50 percent of all citations (Serenko and Jiao, 2012). When a few major scholars leave the problematic domain, its scientific productivity and impact experience a sudden dip. Second, the proponents of a scientific fad tend to view people and social groups as mechanical systems which neglect internal developmental changes. Third, the body of research associated with scientific fads favors generalizations; researchers often exclude relevant data, ignore important variables, and rely on over-simplification. Because of this, their research rarely produces insights applicable in practical settings. Last, over-reliance on and misuse of statistical methods including the violation of fundamental statistical assumptions and the exclusion of outliers can negatively impact the health of a scientific domain. As a result, many researchers become too disappointed with the direction and impact of their chosen area, and the line of research quickly fades away. Business process re-engineering and quality circles are the classic examples of a domain that followed the path of a scientific fad (Dale *et al*., 2001).

There are several signs of a scientific fad. First, fads exhibit a short period of rapid growth in the volume of publications followed by a precipitous decline. Second, scientific fads make limited impact on science in general. They borrow heavily from reference disciplines but fail to contribute back. The reason for this is that their lifespan is too short whereas scholars from established disciplines must take the time and thought to integrate new ideas into their work. Third, given the faulty premises driving research within scientific fads, their long-term practical impact is diminished.

Most active researchers wish to know about the long-term sustainability of their chosen domain. KM scholars are no exception.

2.3 The KM discipline

Professions are organized bodies of experts who solve problems using specialized knowledge. Professions include elaborate systems of training, examination, formal prerequisites, and enforced codes of behavior (Abbott, 1988). While the origins of early professions date to medieval times, most professions have been formally developed since the nineteenth century. Professions function and interact continuously within a larger system. New professions develop when groups of people respond to unmet needs in a particular sector of the economy and form a body of practice that gains societal recognition.

As a distinct scientific discipline, KM emerged in response to the increasing pressure on private and public organizations to make more efficient and effective use of their knowledge.

It has long historical roots because people have been preserving and managing knowledge for thousands of years. KM was initially considered an applied field with little academic presence. However, a discipline cannot solely rely on its practical foundations. Stewart (1991) published a seminal article in the *Fortune Magazine* on the importance of intellectual capital management, and Senge (1990) wrote a book on organizational learning. Shortly afterwards, in 1994, the *Learning Organization* journal was launched. More academic journals came soon afterward. In 1997, the *Journal of Knowledge Management* was launched, and the *Business Change and Re-engineering* journal changed its name to *Knowledge and Process Management*. Practitioners who pioneered the KM field started publishing not only books targeted at other practitioners but also articles in peer-reviewed journals. The field started attracting the attention of both new and well-established academics.

The extant literature presents contradictory evidence as to whether KM has been steadily progressing towards academic maturity to become a reference discipline or whether it is just a scientific fad. On the one hand, Wilson (2002) claims that KM is a management fad that is doomed to fail. Scarbrough *et al.* (2005) argue that KM is not only a scientific fad but also a sub-discipline of MIS. Scarbrough *et al.* (1999) and Scarbrough (2003) also state that KM is merely a management fad.

On the other hand, Scarbrough and Swan (2001) conclude that the management fashion model offers a useful but incomplete explanation of the KM field discourse. Moreover, Holsapple and Wu (2008) are convinced that the KM discipline is a substantial field of study based on diverse reference disciplines. It has much to offer to the scientific community and is relevant to modern business practices. By observing steadily growing interest in KM research, Hislop (2010) suggests that KM cannot be regarded as a management fad. Ponzi and Koenig (2002) and Koenig and Neveroski (2008) agree. Grant (2011) observes that KM discourse has gradually settled with no apparent decline in the interest of researchers. Serenko, Cox, Bontis and Booker (2011) empirically demonstrate that KM exhibits signs of a healthy academic domain. Through a bibliometric analysis of the KM literature, Wallace *et al.* (2011) conclude that the distribution of KM publications is within the scientometric norms. Given this divergence of opinions, more research is needed to better understand the state and future development of the KM discipline. Particularly, it is critical to study on which disciplines it draws knowledge (i.e. whether KM is a receiving discipline), and which disciplines it influences (i.e. whether KM is a reference discipline).

At the same time, it is important to remember that KM 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 (Andriessen, 2004; Ferguson, 2005; Jennex and Olfman, 2005; Jennex and Olfman, 2006). When the KM discipline was in its embryonic stage in 1994, non-academics produced 30 percent of all peer-reviewed KM articles, but by 2009 their output declined to only 10 percent (Serenko *et al.*, 2010). There are claims that KM practitioners rarely use scientific terminology (Eijkman, 2011) and empirical methods (Andrikopoulos, 2010). Therefore, it is vital to study whether the KM body of knowledge is being applied in practical settings. This may be achieved by means of citation analysis. If the KM field has made a practical impact, its most influential publications should be cited in not only academic but also practitioner publications.

The following two research questions are proposed:

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

3. Methodology

In this study, a scientometric analysis of the most influential articles published in the *Journal of Knowledge Management* (*JKM*) was done. This journal was chosen for the following

reasons. First, it is a leading scholarly outlet in the domain with an A + ranking (Bontis and Serenko, 2009; Serenko and Bontis, 2009). Second, JKM has a wide subscription base. For example, in 2011 JKM articles were downloaded over 344,000 times[1]. Third, it provides a very comprehensive coverage of the scientific domain of interest by concentrating on the various aspects of knowledge management.

The use of the most influential articles is a recognized technique in citation analysis (van Zeebroeck *et al.*, 2008). All articles included in JKM h-index as of May 1, 2011 were selected based on Google Scholar by means of the Harzing's Publish or Perish tool (see www.harzing.com/pop.htm for further information). The h-index, introduced by Hirsch (2005), is a measure of scientific impact of individuals, journals and institutions. With respect to journals, the 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 (Saad, 2006; Moussa and Touzani, 2010). Articles included in the journal's h-index are usually considered the most significant works that ever appeared in this outlet.

As a tool for citation analysis, the use of Google Scholar offers various advantages. In contrast to Thomson Scientific (formerly known as the Institute for Scientific Information, or ISI), Google Scholar covers a wide variety of publications including open-access journals, books, book chapters, conference proceedings, professional magazines, patents and industry reports (Harzing and van der Wal, 2008). Even though some of these publications are not peer-reviewed (e.g. reports, working papers, government publications, etc.), they are legitimate sources of citations which benefited from ideas expressed in the cited work. In addition, Google Scholar contains non-English publications (Nisonger, 2004; Kousha and Thelwall, 2007), whereas Thomson is mostly limited to English language articles. Therefore, Google Scholar is the most acceptable tool to achieve the purpose of this study.

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

1. All 63 articles included in the h-index of JKM were selected.
2. Since Google Scholar, as all other article databases, may contain errors, omissions and duplicate entries, a manual analysis of the h-index articles was done and appropriate adjustments were made.
3. A list of 5,939 citing (i.e. publications that cited the examined JKM articles) and 2,057 cited (i.e. references in the examined JKM articles) works was created (for a detailed definition of citing and cited publications, refer to Taneja *et al.* (2009)).
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. Categories of citing and cited works (e.g., peer-reviewed journal, thesis, peer-reviewed conference proceedings, book chapter, practitioner journal/magazine, technical & business report, etc.) were identified.
7. For citing and cited peer-reviewed journals, the journal's field of research (e.g. marketing, management information systems, economics, etc.) was recorded by adapting the classification scheme of the Excellence in Research for Australia (ERA) Initiative (see www.arc.gov.au/era/default.htm – the list as of March 2010).
8. From the list of citing and cited peer-reviewed journals, all KM journals appearing in the list of Bontis and Serenko (2009) were excluded (i.e. these are KM-centric outlets). From the remaining sets, 200 entries were randomly selected. The abstract and full text of each selected paper was analyzed to determine whether the topic of the study pertained to KM.

4. Results

Table I outlines the language of citing and cited works. It reveals that citing works were written not only in English but also in other languages. The fact that Chinese is the most common non-English language is not surprising since Chinese institutions are frequent JKM subscribers. In contrast, very few JKM articles cited non-English sources.

Table II presents self-citation patterns. It shows that the observed self-citation rates are low which demonstrates that the discipline does not exhibit a problematic self-citation behavior.

Tables III and IV show categories of citing and cited works, respectively. First, theses, dissertations, and graduate or undergraduate projects, which represent indicators of scientific growth (Andersen and Hammarfelt, 2011), constitute 17 percent of all citing sources. Therefore, the KM discipline is in the phase of academic expansion. Second,

Table I Language of citing and cited works

Language	*Number*	*Percentage*
Citing works		
English	5,206	87.66
Chinese	208	3.50
Portuguese	149	2.51
German	131	2.21
Spanish	92	1.55
French	47	0.79
Korean	22	0.37
Italian	18	0.30
Other (Swedish, Turkish, Dutch, Finnish, Polish, etc.)	66	1.11
Total	5,939	100.00
Cited works		
English	1,996	97.03
Other (German, Dutch, Swedish, French, etc.)	61	2.97
Total	2,057	100.00

Table II Self-citation behavior

	Citing works		*Cited works*	
	n	*%*	*n*	*%*
Author self-citations	85	1.43	115	5.59
Journal self-citations	309	5.20	65	3.16
Joint author and journal self-citations	6	0.10	8	0.39

Table III Categories of citing works

Categories of citing works	*Number*	*%*
Peer-reviewed journals	2,588	43.58
Theses, dissertations, graduate 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
Web sites	5	0.08
Case studies	3	0.05
Newspapers	1	0.02
Total	5,939	100.00

Table IV Categories of cited works

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
Web sites	40	1.94
Technical and business reports	16	0.78
Working papers	11	0.53
Theses, dissertations, graduate 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
Total	2,057	100.00

practitioner journals/magazines constitute 5 percent and 16 percent of citing and cited works, respectively. The most influential JKM articles frequently use non-refereed sources (see Table V), and contribute to the state of practice, but to a lesser degree. In other words, the KM academic literature borrows ideas, examples, cases, concepts, etc. from the professional literature, uses them to extend the theoretical body of knowledge, and disseminates this knowledge within peer-reviewed literature and, to a lesser extent, practitioner publications.

Tables VI and VII show journal fields for citing and cited works. Table VIII outlines topics of citing and cited peer-reviewed journal articles published in non-KM centric journals.

The following framework summarizes the findings above and describes the intellectual core and impact of the KM discipline (see Figure 2).

5. Conclusions

The goal of this study is to explore the intellectual core and impact of the KM discipline on the state of theory and practice. For this, 63 articles included in the h-index of JKM were subjected to scientometric analysis. Based on the findings, a number of important implications and conclusions emerged that warrant discussion.

5.1 Implications and recommendations

Implication #1: the KM discipline builds its knowledge largely on English-language research. As demonstrated in Table I, the most influential JKM articles cite only English-language sources. This observation is disappointing since a major part of KM research is conducted in non-English speaking countries (Serenko *et al.*, 2010; Curado *et al.*, 2011; Dwivedi *et al.*, 2011), which publish scholarly journals in their own languages. Knowledge in these publications is applied only domestically, but it may be a lost opportunity for the international scientific community.

Implication #2: The KM discipline successfully disseminates its knowledge through both English and non-English language works. Of all citations to the most influential JKM articles,

Table V Summary of citing and cited works

Citing works	Peer-reviewed	67.24%
	Non-peer-reviewed	32.76%
Cited works	Peer-reviewed	48.62%
	Non-peer-reviewed	51.38%

Table VI Journal fields for citing peer-reviewed journals

Journal's research field	*Percentage of citations*
Knowledge management	31.03
Management information systems	13.14
General management	11.51
Technology and innovation management	6.65
Human resources, organizational behavior, workspace learning and workspace training	6.07
Library and information science	5.60
Engineering	3.09
Education	2.59
Operations management and management science	2.32
Multidisciplinary	2.09
Economics	2.05
Health care	1.97
Tourism, hospitality and services industry management	1.85
International business	1.43
Artificial intelligence	1.20
Public policy and administration	1.12
Marketing	1.08
Communication and media studies	0.70
Computer science, computer software and computer hardware	0.70
Sociology, philosophy and history	0.70
Psychology	0.50
Entrepreneurship	0.46
Accounting	0.43
Social work	0.39
Linguistics, literary studies and journalism	0.31
Architecture	0.23
Biology	0.15
Agriculture	0.12
Criminology and law	0.12
Technology	0.12
Business ethics	0.08
Business strategy	0.08
Political science	0.08
Finance	0.04
Geography	0.04
Total	100.00

12 percent came from non-English language sources (see Table I). This observation is very encouraging since it shows that:

- KM research has an impact beyond the English-speaking academic world; and
- many non-English language nations are interested in KM research and make use of it.

Even though the KM discipline has been relatively successful in disseminating its knowledge into non-English works, 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-term. The amount of scientific expertise and knowledge in non-English language countries is substantial. For example, in 2011 China has passed the USA in research publications in the field of nanotechnology and nanoscience (Kostoff, 2012).

Implication #3: the KM discipline does not exhibit a problematic self-citation behavior. Author self-citations, when researchers cite their own works, are an acceptable and often necessary academic practice. Journal self-citations, when the paper published in a journal cites works 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 scientific discipline. In some extreme, unethical cases, journal editors force authors to cite their journal as a condition for final paper acceptance

Table VII Journal fields for cited peer-reviewed journals

Journal's research field	*Percentage of citations*
General management	36.82
Knowledge management	12.48
Management information systems	6.68
Operations management and management science	6.56
Business strategy	6.43
Human resources, organizational behavior, workspace learning and workspace training	6.31
Marketing	4.67
Technology and innovation management	3.15
Library and information science	2.65
Sociology, philosophy and history	2.40
Artificial intelligence	1.39
Economics	1.39
Communication and media studies	1.26
Education	1.13
International business	1.01
Physics	1.01
Psychology	1.01
Multidisciplinary	0.76
Entrepreneurship	0.63
Accounting	0.50
Engineering	0.50
Computer science, computer software and computer hardware	0.38
Public policy and administration	0.38
Health care	0.25
Linguistics, literary studies and journalism	0.13
Tourism, hospitality and services industry management	0.13
Total	100.00

Table VIII Topics of citing and cited peer-reviewed journal articles (excluding KM-centric journals)

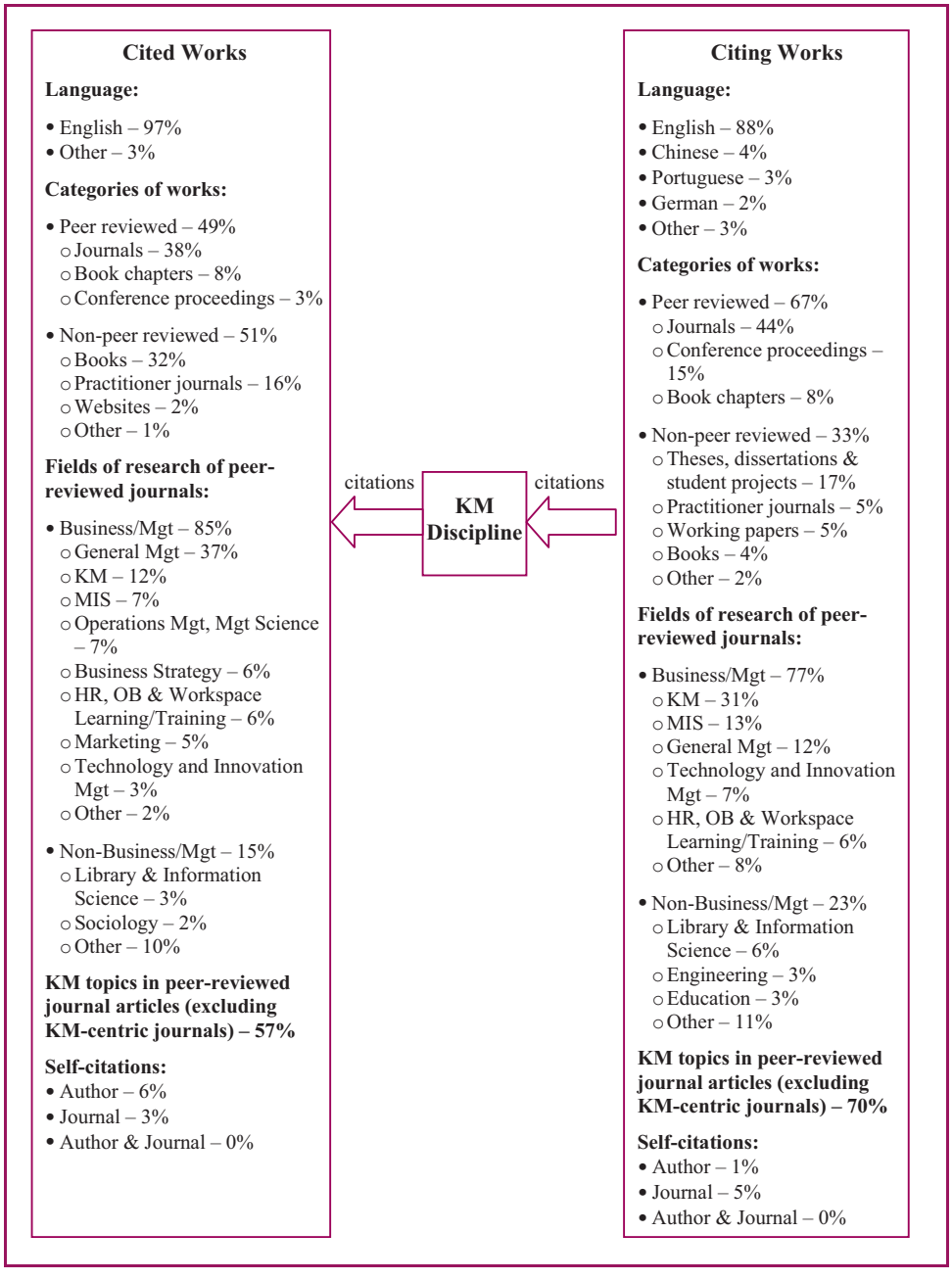
Topics of citing articles	KM	70%
	Non-KM	30%
Topics of cited articles	KM	57%
	Non-KM	43%

after the formal review process (Bjørn-Andersen and Sarker, 2009), and self-citations may constitute up to 85 percent of all journal's citations (Monastersky, 2005). Fortunately, the rate of self-citations in JKM is within an acceptable range. To the best knowledge of the authors, no incidents of forced citations have been reported by KM researchers. Nevertheless, KM stakeholders should be aware of potential danger of extreme self-citations or forced citations.

Implication #4: books and practitioner journals play an important role in the development of KM theory. Books and practitioner journals are an important source of ideas, examples, and content for the development of KM theory. This finding is consistent with Serenko *et al.* (2012) who report that references to books constitute 45 percent and 30 percent of all references in authored and edited KM books, respectively. They also demonstrate that references from practitioner magazines represent almost 20 percent of all KM book citations. In the present study, books and practitioner journals constituted 32 percent and 16 percent of all cited sources, respectively, which highlights their importance in the establishment of the KM field.

Implication #5: the KM discipline converts experiential knowledge into academic knowledge. Approximately one-half of the knowledge in the most influential *JKM* articles is built on non-peer reviewed sources. This is experiential knowledge. Experiential knowledge,

Figure 2 Intellectual core and impact of the KM discipline



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. A key achievement of the KM 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 practitioners.

Given the status of KM 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 offer practical examples and cases that may be included in academic work. Most importantly, professional publications identify emerging issues, topics

in need of investigation, and research ideas, which may inspire academics to embark on studies of theoretical and practical value.

Implication #6: KM 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. The findings indicate that KM topics in peer-reviewed journal articles (excluding KM-centric journals) constitute 57 percent and 70 percent of cited and citing works. Therefore, KM researchers borrow more knowledge from other (i.e. non-KM) disciplines than they infuse in other domains. The KM discipline borrows ideas from other business fields, mostly from general management, management information systems, operations management, management science, business strategy, human resources and marketing, and uses them to advance KM theory and methodology.

However, there is indication that KM is progressing well towards academic maturity and scholarly 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 has already exerted some influence on other fields since 30 percent of all citations came from non-KM papers published in non-KM peer-reviewed journals. Third, 23 percent of all citations to the most influential articles came from non-business journals, which demonstrates the dissemination of knowledge far beyond the management domain.

In the future, KM researchers should promote the dissemination of KM knowledge beyond their disciplinary boundaries. For example, they may engage in inter-disciplinary projects, publish their papers in non-KM journals, and inform their academic colleagues about their work. Journal editors should target their journals not only at KM readers, but also at researchers from other disciplines.

Implication #7: the direct impact on practice of the KM discipline is somewhat limited, but it is expected to increase in the future. A scientific discipline can impact the state of practice in many ways. One of them is the dissemination of scholarly knowledge in non-academic works, particularly in government documents, patents, practitioner magazines, technical and business reports, case studies, news broadcasts, speeches, and newspapers, which is revealed in the citation patterns of peer-reviewed articles. These major practitioner sources represent only 6.6 percent of all citing works. On the one hand, this number is relatively small; on the other hand, the KM discipline has made some practical impact. It is expected that as the overall number of KM citations grows, so will the overall number of citations from professional sources. This, in turn, will increase the cumulative impact of the KM discipline on practice. In fact, we cannot expect peer-reviewed publications to be cited predominantly in practitioner works, and the finding that KM articles are cited in practitioner sources is encouraging.

To facilitate further practical impact of KM research, 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 web sites with summaries of their work, send their publications to relevant professional associations, and participate in consulting projects.

Implication #8: KM is not a scientific fad. A scientific fad is a field of study that borrows knowledge from the other disciplines, but fails to make a significant impact on the other scholarly domains. It experiences an initial excitement period accompanied by an exponential growth in the volume of published works, followed by a sharp decline. Its academic ideas are rarely transformed into practical applications.

This study demonstrates that the KM discipline is not a scientific fad. Instead, it exhibits signs of an emerging domain that has been gradually progressing towards academic maturity. The field will continue expanding in the future. Recall that theses, dissertations, and graduate or undergraduate projects, which reflect future scientific growth, represent 17 percent of all citing sources. Most of these publications will eventually appear in

peer-reviewed journals and contribute to the knowledge base. In a similar vein, Grant (2011) recently observed that the volume of KM output shows no decline. The field exhibits no problematic self-citation behavior. It converts experiential knowledge into academic knowledge, which in turn is delivered to practitioners through several knowledge dissemination channels, including books and textbooks (Serenko, Bontis and Hull, 2011). KM papers appear in both KM-centric and non-KM journals, including non-business ones. Academic KM knowledge has spread to professional outlets, and this trend is expected to accelerate in the future. Overall, this evidence behooves us to believe that even though KM is not the strongest management discipline (yet), it is definitely not a scientific fad. It follows a regular path of disciplinary development towards academic maturity and may eventually become a reference discipline. Therefore, KM practitioners should not worry that KM research will soon fade away. Instead, they are encouraged to apply scholarly KM knowledge in practical settings, pursue formal and informal KM education, engage in KM research and collaborate with academics.

5.2 Limitations and future research

This study has had several limitations. First, only articles from a single KM journal were analyzed. Currently, there are over 20 KM-centric journals, and that number is expected to grow in the future. Second, only articles included in the JKM's h-index were analyzed. However, *JKM* is the discipline's premiere journal, and its well-cited papers represent the KM field in general. In addition, a large number of citations (almost 8,000) were analyzed. Third, there are issues with citation analysis. For example, there is no proof that the authors of citing papers actually read the original work or interpreted the ideas correctly. Negative citations, when the cited paper is critiqued, were not excluded in this study. Fourth, there are other approaches to investigate the intellectual core and impact of a discipline. For example, interviews with the discipline's founders and journal editors are a useful inquiry method. Nevertheless, none of the limitations above were fatal.

This study empirically explored the intellectual core and impact of the KM discipline from the reference discipline perspective. It presents a number of implications and recommendations for various stakeholders of the KM discipline. This investigation also calls for future scientometric research to better understand where the KM discipline was, where it is, and where it wants to be.

Stakeholders should also debate the KM's progress towards becoming a reference discipline. In contrast to traditional scholarly disciplines (e.g. pure sciences) based on the scientific model of knowledge discovery (Bennis and O'Toole, 2005), KM is a professional discipline that was created by practitioners. It is possible that to become a ''real'' and ''recognized'' scholarly discipline it does not need to be considered a reference discipline. Instead of disseminating its knowledge to other business and non-business fields, KM 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 journal editors, board members, reviewers and granting agencies need to consider to establish the desired direction of the KM discipline.

Note

1. Personal communication with Rory Chase, *Journal of Knowledge Management* Editor.

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