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Guest editorial

Knowledge intensive organisations: on the frontiers of knowledge management

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Abstract

Purpose – *This paper aims to further research on leadership and knowledge management through formal knowledge strategies in knowledge-intensive organizations (KIOs), and analyse knowledge management challenges and approaches within KIOs, especially tacit knowledge.*

Design/methodology/approach – *This paper is based on conceptual and literature research.*

Findings – *Managing knowledge as an organizational asset involves how knowledge is obtained, stored and organized, and accessed and shared when needed. This is crucial for KIOs. Knowledge that is not captured, understood and transferred, throughout the organization, is useless. This requires the integration of systems and processes with people and leadership. Tacit knowledge generation and transfer is especially important in KIOs. In particular, the success of KIOs depends crucially on management's ability to give leadership in a way that supports knowledge-intensive teamwork. The global nature of internal and external knowledge networks adds to the leadership challenge. This can be made more complex by cultural differences, intellectual property protection (formal and informal) and talent scarcity.*

Research limitations/implications – *Further research is needed to identify the types of KIO and to better understand sound common knowledge management and related leadership principles across all types of KIO and those that are more context-dependent on the type of KIO and/or its business and cultural context. More research is needed on policy making organizations, in-company policy-making research and development and creative industries.*

Originality/value – *The paper takes forward research on leading knowledge management in KIOs and introduces 14 challenging new papers in this specific field of research.*

Keywords *Knowledge creation, Tacit knowledge, Knowledge hiding, KIO performance, Knowledge intensive organizations, KIOs, Leading knowledge management*

Paper type *Research paper*

The ability to share valuable knowledge in business in efficient and effective ways is a crucial means of innovation, problem solving and continual improvement. In business, this is a fundamental strategic resource and can create a sustainable competitive advantage in new, challenging markets as well as in existing markets facing turbulent changes or stagnation. Knowledge is, therefore, a crucial organizational asset. The three main aspects of knowledge management for any organization are:

1. how the knowledge is obtained;
2. how it is stored and organized; and most importantly; and
3. how that knowledge is accessed and shared when needed.

This is especially true of what we term as knowledge-intensive organizations (KIOs).

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“The ability to share valuable knowledge in business in efficient and effective ways is a crucial means of innovation, problem solving and continual improvement.”

Organizations require relevant, timely information and knowledge to make sound decisions. In a business environment, decisions relating to strategy, allocation of resources or competitive responses depend on accurate knowledge of internal and external information such as capacity, operations, finances, customer trends and competitive actions. Knowledge that is not captured, understood and transferred throughout the organization is useless.

Knowledge-intensive organizations

KIOs are of growing importance worldwide, particularly, but by no means exclusively in developed economies. KIOs have been defined by Bettencourt *et al.* (2002) as organizations whose primary value-added activities consist of the accumulation, creation or dissemination of knowledge for the purpose of developing a customized service. Other definitions by Caniëls and Romijn (2005); Simmie and Strambach (2006) and Strambach (2008) echo this theme of organizations whose primary activities are dependent on knowledge management. KIOs are often equated with firms that offer knowledge-intensive professional services such as accounting and consultancy. For example, Den Hertog (2000) sees KIOs as companies/organizations which rely heavily on professional knowledge, i.e. knowledge or expertise related to a specific (technical) discipline or functional domain, to supply products and services that are knowledge based as well as public administration/the Civil Service.

While professional services can be seen as a prototypical KIO, it is important to identify different types of KIOs. For example, Ejler *et al.* (2011, p. 13) identify the classic professional services, firm the internal service organization and other knowledge-intensive organizations where the ratio of highly skilled specialists to support/admin personnel is high. This last category spans research and development (R&D), health care, financial services, education and government policy departments. While giving some insight, this categorization is insufficiently developed as:

- their second category is in reality an internal organizational unit rather than a firm; and
- their third category covers such a wide range of organizations that it is unclear they will have characteristics that are sufficiently common to give substantial insights.

As argued below in our conclusion, there is still much to be done to develop a rigorous and meaningful categorization which will provide deeper insight into knowledge management in such KIOs.

Alongside the concept of a KIO is that of a knowledge-intensive service (KIS). Knowledge-intensive services organizations (KISO) are defined by the European Commission (2012) as services where knowledge is the main production factor and the good they offer. While recognizing the significance of KIOs, the European Commission has a very wide range of organizations that it defines as KISs (Eurostat, 2014). The types of knowledge as well as the types of organizational forms are varied. In addition to technical knowledge and factual/data knowledge, attention needs to be given to particularly intangible knowledge assets such as tacit knowledge (Polanyi, 1966).

Research in this area has not progressed strongly, and major gaps are observable. While the concept of KIS recognizes the embedding of knowledge in services much wider than professional services, it can be taken well beyond the boundary where an organization is knowledge intensive at its core. For example, EU statistics include water and air transport as KISs (Eurostat, 2014). Others included in their definition raise interesting questions, such as betting and gambling, which in many ways are heavily knowledge intensive, though often not seen in same category as professional services. The importance of KIOs and KISs has been increasing in many economies worldwide, particularly in developed economies. It is estimated that in the UK, Finland and Sweden, KISs account for more than 39 per cent of employment (European Commission, 2012), though as argued above, there are significant question marks around the definitions used in such calculations. Our perspective is that leadership and management are critical challenges in such organizations as people are their major asset. Structures, processes and practices have evolved to meet the distinctive needs of the various areas of activity. There are both similarities and differences between KIOs which include not only knowledge-intensive business services such as IT services, financial services, R&D, legal services and creative businesses but also knowledge-intensive non-business services such as education, cultural organizations and the civil service. Some such as health services can fall into either category depending on the specific services and the national context of how medicine is organized in that country.

Why this issue is *timely* and special

The topic of this Special Issue has been overdue for more attention. To date, research on leadership and knowledge management through formal knowledge strategies in such organizations has not kept pace with research on management of knowledge in manufacturing organizations and others where knowledge is embedded in tangible products. KIOs face a number of new developments in their competitive environment including a global shortage of talent (Schuler *et al.*, 2011), information technologies that are reshaping the competitive landscape (Fedoroff, 2012), the development of new business models such as offshoring of KISs (Lewin *et al.*, 2009) and global open innovation models (Chesbrough, 2010). All of these strongly affect knowledge management, offering opportunity and barriers to innovation. It is important not to assume that knowledge workers work together productively even when mutual interdependence is necessary for high performance. The paper in this Special Issue by Huo *et al.* demonstrates, for example, that there may be organizational and personal incentives to hide knowledge rather than share. Commitment to organizational goals by knowledge workers is often problematic, especially when such workers do not see their long-term career in the organization and/or they feel attached to a profession. For example, Osterloh and Frey (2000) state that, as knowledge generation and transfer are essential for a firm's sustainable competitive advantage, it is important to ask specifically what kinds of motivation are needed to generate and transfer tacit knowledge, as opposed to explicit knowledge. Cushen and Thompson (2012) found that skilled technical workers in knowledge-intensive firms can be uncommitted, angry and high performing at the same time, while Grandori (2016) argues that more democratic governance has positive business outcomes in KIOs.

Increasingly, people's knowledge, experience and creativity form the backbone of the organization's success, and leading them and managing knowledge to achieve the organization's aims and objectives is of key importance, as is the retention of developed knowledge employees over time.

"Organizations require relevant, timely information and knowledge to make sound decisions."

"**Knowledge that is not captured, understood and transferred throughout the organization is useless.**"

The growth of KIOs also depends crucially on management's ability to give leadership in a way that supports knowledge-intensive teamwork across time and distance. The global nature of much knowledge and of knowledge networks and the ambitions of KIOs to expand globally add to the leadership challenge, bringing into focus both cultural differences and other international business issues such as the protection of intellectual property rights and retaining your best talent. As stated earlier, such leadership and knowledge management challenges are also mirrored in Civil Service bodies, creative industries and R&D organizations.

In this Special Issue, we address the challenges of leading and managing KIOs, departments and administrations through formal knowledge strategies. We seek to enrich knowledge management studies by broadening the focus from only the knowledge itself and the facilities for processing it, to an exploration of the differences arising from organizational, personal and leadership factors. We have framed this in the context of the strategic importance of knowledge, of people and of leadership in KIOs, both traditional and innovative, both locally and internationally, and to lay the groundwork for the development of theory, as well as offering well-founded practical approaches. In line with the focus of the *Journal of Knowledge Management* on implementing formal knowledge strategies and approaches, our approach has been to emphasize the strategic approach to leading knowledge management in KIOs, rather than simply examining organizations which are acknowledged as knowledge-based. But first, let us explore briefly the difference between explicit and tacit knowledge.

Explicit and tacit knowledge

There are two generally accepted and acknowledged types of knowledge: explicit and tacit knowledge. Both are important, and neither is complete without the other. Explicit knowledge is the easiest to describe and understand. It is the knowledge that can be spoken, communicated, transmitted, processed and stored relatively easily. It embodies information that is interpreted, put in context and anchored in beliefs and commitments of individuals (Nonaka *et al.*, 2000) and, as such, subject to easy codification, storage and retrieval. This is the type of "knowledge" with which most firms and organizations are familiar and can be found, for example, in the codification of plans, operating manuals, scientific formulas and patents (Seidler-de Alwis and Hartmann, 2008). Generally speaking, explicit knowledge is the process and product by which knowledge can be systematically communicated throughout an organization. As such, it is a reflection of what the organization has learned in the past and has codified – typically, it is not the "newest" knowledge.

Although explicit knowledge is important to the operation of any organization, it is tacit knowledge that is crucial to survival and long-term success. Tacit knowledge is far more difficult to describe and explain – it is reflected in the procedures, rooted in action and is acquired by the sharing of experiences, by observation and by imitation. Tacit knowledge yields insights necessary for the understanding of explicit knowledge and for the placement of that knowledge in context. According to Kikoski and Kikoski (2004), it is tacit knowledge that creates the learning curve for others to follow and ultimately provides the competitive advantage for long-term success. Transforming tacit knowledge into explicit knowledge is a major challenge, addressed, for example, by the "after action reviews" done in the military or identifying "lessons learned" in commercial projects.

Within KIOs, knowledge represents a crucial asset. It serves as the source of continual innovation via new ideas, process improvement and arguably the true source of sustainable competitive advantage. Thus, the ability to effectively harness knowledge as well as create new knowledge and share it within an organization essentially constitutes the field of knowledge management.

While there is no "silver bullet" in this field, knowledge management has been studied for many years in the areas of knowledge creation, knowledge transfer and knowledge storage and access (Chen *et al.*, 2011; Zheng *et al.*, 2010). It is well documented that explicit knowledge, which is codified into reports or processes like software programs represents the easy part of explicit knowledge management. This codified knowledge can be easily stored in databases, easily queried and transferred across the building or across the globe via the internet or intranets. Knowledge bases that are well managed, filtered for relevancy and currency and monitored by subject matter experts have been found effective for knowledge transfer across organizations. Knowledge maps showing where crucial expertise is located within an organization are similarly useful and relatively easy to administer (Wang and Belardo, 2005).

However, leveraging tacit knowledge beyond the individual specialist knowledge worker remains more elusive. This type of knowledge resides within the individual in "the little grey cells" (Agatha Christie's Poirot) and results from cumulative experiences, learning and reflection. It is difficult to codify and transfer for many reasons (Nonaka *et al.*, 2000; Seidler-de Alwis and Hartmann, 2008; Kikoski and Kikoski, 2004). Many people have vast knowledge in different areas, but do not know how to articulate and communicate it. They may not know that their knowledge is important or relevant in different situations, or may not even be aware of the depth of their knowledge. Others may also not know with whom to connect inside an organization even when the knowledge exists. People may also not want to share their knowledge if it represents a source of power or job security. Hence, it is no surprise that even Zhenhua (2003, p. 15) explains how Polanyi (1966) differentiates two forms of tacit knowledge, "Connoisseurship and skill together are the indispensable elements of the art of knowing which is at the root of great scientific discoveries", while Gulick (2016) sketches out what some of the aspects of a full account of the tacit knowledge might look like. This follows Millar (2008) who expands the "knowing what" of explicit knowledge and the "knowing how" of tacit knowledge with the "knowing for", a second aspect of tacit knowledge as where the expert becomes able to have (what seems like) a "direct" strategic or creative perception – taking account of knowing-what and knowing-how for that situation, or set of people. It is tacit, it is not just knowing-how and it is mainly acquired through experience and judgement. Good researchers have this "knowing-for" about what to try next – that is perhaps the definition of a good researcher. Following Polanyi, then, tacit knowledge can be seen as having a recognition facet as well as a skill aspect. Separating the "knowing-for" (a here-and-now perception of appropriateness) from the simple recognition of the situation enables us to make a better analysis. It also allows a clearer insight into the dual aspects of innovating – the intertwining of specific knowledge and an insight that usually comes from experience.

How organizations develop, store and transfer knowledge is becoming increasingly important. Yet, organizations seem to struggle with capturing knowledge, maintaining that knowledge over time and transferring it throughout the organization for customer and internal benefit.

Summarizing

We believe that this unique set of organizations with regards to knowledge management that we have termed "knowledge intensive service organizations" (KISO) was long overdue for more attention; to date, research on leadership and knowledge management through formal knowledge strategies in such organizations has not kept pace with research on management of knowledge in manufacturing organizations. KISOs face a number of new developments in their competitive environment including a global shortage of talent (Schuler *et al.*, 2011), information technologies that are reshaping the competitive landscape in KISs (Fedoroff, 2012), the development of new business models such as offshoring of KISs (Lewin *et al.*, 2009) and global open innovation models (Chesbrough, 2010). All strongly affect knowledge management, offering opportunity and barriers to innovation.

For these organizations, knowledge is not a luxury or simply an add-on to whatever else that they do – it is a critical on-going, daily component of the organization's life where people are their only asset. Therefore, the study of such KIOs can yield rich insights into knowledge management that can aid any organization, and the astute reader will be able to "see" how these organizations manage the process of knowledge development from explicit to tacit knowledge. Increasingly, people's knowledge, experience and creativity form the backbone of the organization's success and leading them and managing knowledge to achieve the organization's aims and objectives is of key importance, as is the retention of developed knowledge employees over time.

The growth of KIOs also depends crucially on management's ability to give leadership in a way that supports knowledge-intensive teamwork (Kikoski and Kikoski, 2004; Weick *et al.*, 1999). The global nature of much knowledge and of knowledge networks and the ambitions of KIS firms to expand globally add to the leadership challenge, bringing into focus both cultural differences and other international business issues such as the protection of intellectual property rights and retaining your best talent. As said, such leadership and knowledge management challenges are also mirrored in Civil Service bodies, creative industries and R&D organizations.

Contents of this special issue

For this Special Issue, we have selected 14 outstanding papers that make us think over and over again about how to lead the managing of knowledge in knowledge intensive firms and organizations and which offer insights to any organization where knowledge is a critical asset. The rich collection assembles worldwide contributions from Australia, China, France, Hong Kong, Indonesia, the Republic of Korea, The Netherlands, the Russian Federation, the United Kingdom and the USA.

We have split the papers into three clusters which seamlessly move from "How knowledge spreads" to "Strategies and tactics for knowledge management" and finally "Exploration and refinement – the diversity of KIOs".

Cluster 1: how knowledge spreads

The first paper, "Understanding knowledge creation in the context of knowledge intensive business processes" by Todd Little, investigates knowledge creation in the context of knowledge-intensive business processes (KIBP). Through a grounded theory approach, he argues knowledge creation in the context of KIBP is negatively influenced by the lack of support for process-competency requirements within these knowledge-intensive processes. Hence, the opportunity exists to explore organizational influences on process-competencies to reduce the negative impact of any gaps identified within their KIBP.

Almost opposite to knowledge creation is knowledge hiding, the subject presented in "Antecedents and Intervention Mechanisms: A Multi-level Study of R&D Team's Knowledge Hiding Behavior", by Huo *et al.* They examine why in 417 R&D teams in Chinese universities, research institutes or companies, knowledge is hidden, and how organizations intervene and influence the negative effects of knowledge hiding. This mirrors other work that has explored knowledge corruption and knowledge hoarding (Mahon, 2015; Mahon and Jones, 2015). Huo *et al.* found that the relationship between individual psychological ownership and territoriality was weaker when the perceived knowledge value was lower and task interdependence was higher, and stronger with higher perceived knowledge value and lower task interdependence. Researching knowledge territoriality in the Chinese cultural context will help to distinguish territorial behaviours and to take preventive measures. In addition, it provides constructive strategies for reducing the negative effect of organizational intervention in knowledge territoriality.

The next paper is about knowledge sharing in which Susan Grant explores a case of early adoption in the use of social media tools for the purposes of knowledge and information sharing across a supply chain in the UK home insurance market, in "Classifying emerging knowledge sharing practices and some insights into antecedents to social networking: A case in Insurance". She explores a case of early adoption in the use of social media tools for the purposes of knowledge and information sharing across a supply chain in the UK home insurance market and uncovers a set of emerging practices which support both information and knowledge exchange, but which are in the main driven by organizational factors such as buyer power and supplier competitive influencing.

A paper with a totally new methodological approach is Tatiana Khvatova's "How to measure trust: the percolation model applied to intra-organisational knowledge sharing networks". Cooperation and tacit knowledge have become strategically important, especially for KIOs. However, it is difficult or even impossible to build any relationship and cooperation without trust. In this paper, the topic of "how to measure trust" is taken up, and a new methodology is applied to analyse the interconnections between trust, knowledge and people by referring to the percolation theory as the methodological basis for the research question: to what extent is successful knowledge sharing likely to take place within the network? And what are the critical values of average trust and average connectivity within the network? It has been shown that there is a minimum level of communicative behaviour that a finite size knowledge network must maintain if knowledge is to percolate within it, so that knowledge sharing can occur within the network, and that that knowledge sharing is strongly influenced by the connectivity features of the network and receptivity of the nodes expressed in particular in trust and perceived reliability of acquired knowledge. This paper opens the way for more research to follow.

Cluster 2: strategies and tactics for knowledge management

In the second section, we examine further a number of knowledge management strategies and tactics, starting with Mitch Casselman's "Optimizing decisions using knowledge risk strategy", which looks at a strategic approach for making trade-offs, represented as an efficient knowledge-risk frontier, between knowledge and risk for organizational performance. The postulated link between risk and knowledge gaps establishes a knowledge-based view of firm risk and recognizes trade-offs for decisions regarding knowledge accumulation.

In "Reconciling ambiguity with interaction: Implementing formal knowledge strategies in a knowledge intensive organization", Jason Cordier looks at the actions autonomous knowledge workers perform to implement formalized knowledge strategies as part of an accreditation – a qualitative study over 14 months. He found that though faculty members received similar information, the standard was implemented in different and conflicting ways. Three themes explain these differences:

1. different approaches to ambiguous KM practices;
2. enablers and inhibitors of knowledge sharing; and
3. different conceptions of continuous improvement.

This is a single case study and is promising exploratory research.

Siti Rohajawati tackled the implementation of the knowledge management strategy for a Mental Health Organization, an area that has had to date limited attention in the literature, in "Mental Health Knowledge Management: Critical Success Factors and Strategy of

Implementation". The data were collected in five referral mental hospitals in Indonesia and was analysed using quantitative qualitative and triangulation methods. It was found that the organizational culture was a great barrier and forty-three influential factors were identified but also that knowledge management is a useful emerging discipline. This study is probably the first to analyse factors that are of influence in a MHKM initiative programme.

Rajneesh Narula examines the varying impact of firm-level factors in service sectors in "How do collaboration and investments in knowledge management affect process innovation in services?" and finds that collaboration with different types of users, and investments in KM practices affect radical versus incremental process innovation differently. Collaboration with existing users influences incremental process innovation directly, but not radical innovation; and prospective user collaboration matters for radical, but not incremental innovation. Hence, while collaboration with existing users for incremental process innovations does not appear to generate significant managerial challenges, to pursue radical innovations firms must engage in intensive collaboration with prospective users. Higher involvement with prospective users requires higher investment in knowledge management practices to promote efficient intra- and inter-firm knowledge flows.

In the next paper, Kibum Kwon and Daeyeen Cho too look at knowledge management and leadership innovation and explore the relationship between transactive memory systems and organizational innovation. Contrary to previous research results, transactive memory systems were found not to be significantly related to organizational innovation, i.e. knowledge of "who knows what" is not enough to ensure innovative performances. Another finding was that transactive memory systems comprise a statistically significant variable that influences developmental leadership, meaning that developmental leadership can be considered to be a valid construct in predicting organizational innovation.

The last paper in this section is a conceptual paper by Ksenia Krylova *et al.* on "Knowledge transfer in KIOs: the crucial role of improvisation in transferring and protecting knowledge", answering the question: How do knowledge workers' improvisation processes promote both knowledge transfer and protection in knowledge-intensive organizations (KIOs)? Improvisation is proposed as the moderating factor enhancing the positive impact of an experimental culture, minimal structures, storytelling practice and shared mental models on knowledge transfer and knowledge protection.

The paper argues against a "plug-and-play" approach to knowledge transfer that seeks to replicate knowledge without considering how people relate to the routines and the context and highlights to leaders of KIOs the importance of developing awareness, understanding and motivation to improvise to internalize new knowledge being transferred and to create imitation barriers.

Cluster 3: exploration and refinement – the diversity of knowledge-intensive organizations

The first in the final section of papers is by Stephen Chen and Nidthida Lin on "Global dispersion of off shore service providers: an information processing perspective" and proposes a new theoretical perspective on organizational design of offshoring service organizations by adopting an information processing perspective which incorporates the factors of collaborative information technologies, task commoditization and global customer service delivery that are characteristic of modern day KISO. The study sheds light on the effect of the key factors on different dimensions of global dispersion (i.e. spatial/temporal/configurational dispersion) in offshoring service provider organizations. It also shows how the traditional information processing perspective on organizations can be updated and applied to KIOs by incorporating the factors of global collaborative information technologies, task commoditization and global customer service.

In “The Team Absorptive Capacity Triad: A Configurational Study of Individual, Enabling, and Motivating Factors”, Sandor Lowik seeks to understand how knowledge-intensive teams can develop and enhance their team absorptive capacity (ACAP) level, by exploring whether individual and organizational factors are complements or substitutes for team ACAP. The study takes a holistic perspective on knowledge-intensive team ACAP by using a configurational approach. It also highlights the potential of team-level research in the knowledge management literature for both researchers and practitioners. The primary finding is that knowledge-intensive team ACAP depends on a triad of complementary factors:

- team members’ individual ACAP;
- factors that enable knowledge integration; and
- factors that motivate knowledge integration.

Underdevelopment of one or more factors leads to lower team ACAP.

In “Leading Knowledge Management in a Secondary School”, Kai Wing Chu hopes that the findings can encourage further studies to explore the impact of leadership affecting knowledge management implementation in schools. The paper also proposes a knowledge management leadership model comprising leadership in kicking-off knowledge management implementation and processes in the school. More research should be conducted in the near future on the impact of leadership on knowledge management implementation to provide more insights for knowledge management practitioners.

Our final paper is on “Understanding researchers’ strategic behaviour in knowledge production: A case of social science and nanotechnology researchers”. Kasia Zalewska-Kurek *et al.* show that there are large behavioural differences between social science and nanotechnology researchers. While nanotechnology researchers’ behaviours are mostly in Mode 3 (sharing resources; highly autonomous), social science researchers’ behaviours tend to be in Mode 1 (highly autonomous; no need to share resources). The need for collaboration and the need for autonomy are analysed, and managerial interventions are proposed.

Conclusions and future research

Many of the papers above will give rise to further research of importance to further knowledge pushing the frontiers of knowledge management in KIOs. While this set of papers covers many KIOs, there are still many gaps. For example, knowledge management in policy making organizations such as central government as well as comparable functions in commercial organizations is an under-researched field, despite the large bodies of literature on policy making and business strategy, though some research has been done in this area – for example, Mauelshagen *et al.* (2014).

Specific examples of opportunities for further research derived from the papers in this Special Issue include:

- *Knowledge hiding:* The paper by Huo *et al.* on knowledge hiding in China highlights territorial behaviours such as knowledge hoarding and misleading within R&D teams. This behaviour is a major challenge for an organization’s positive intentions in R&D, including internal sharing and teamwork, which inhibit organizational goal accomplishment. Further research could be in two directions. The first is on knowledge territoriality and hiding generally in organizations. The second is on the Chinese cultural and organizational context in relation to knowledge sharing. Together, such research will help to refine our understanding of the nature of territorial behaviour and how to take preventive measures. We also believe that there is value in researching knowledge corruption and hoarding (Mahon, 2015; Mahon and Jones, 2015).

- *Social media*: The social media paper by Grant has contributed an overall conceptual understanding of reasons behind social media adoption, by identifying organizational attributes of buyer power and supplier influence as key antecedents to knowledge sharing within a supply chain in the insurance industry. The importance of social media to sharing information and knowledge has been increasingly dramatically, transforming some functions such as marketing as well as opening new avenues for internal communication and knowledge sharing. It would be interesting to expand research to other types of KIOs, to differing functions and to both internal and external communication in the context of knowledge management.
- *Trust*: In the percolation methodology paper by Khvatova, a learning curve is calculated with increasing trust closely related to the process of knowledge sharing. It would be interesting to develop this insight further and gather more information on how trust can be understood in relation to such topics as knowledge exchange, knowledge sharing, organizational structures, the time factor and cultural differences between knowledge partners.
- *Leadership development*: The developmental leadership paper by Kwon and Cho indicates theoretical and managerial implications of knowledge management in KIOs. As what they term transactive memory systems do not always precede organizational innovation, knowledge of "who knows what" is not enough to ensure success in innovation. To accelerate organizational innovation, further research into intentional managerial interventions such as developmental leadership is important as well as how such interventions work in relation to knowledge management.

More generally, as indicated above, there is a need for greater precision in defining different types of KIOs in relation to:

1. the services that KIOs offer and the extent to which these are essentially:
   - information/knowledge itself; or
   - products/services in which high levels of knowledge are always embedded.
2. the extent to which the knowledge KIOs use is essentially:
   - the sum of knowledge of individual knowledge workers;
   - organizational knowledge independent of individuals; or
   - a combination in which organizational knowhow is leveraged and extended through individual knowledge workers.
3. how dispersed the KIO is, ranging from:
   - organizations with significant concentrations of knowledge workers in one place, through;
   - organizations with dispersed centres of activity, to
   - organizations that are highly dispersed and potentially virtual in organizational form; and
4. the impact of globalization on knowledge-intensive industries and the influence of national and organizational cultures on global knowledge management in KIOs.

From this it will be possible to develop a better understanding of leadership in KIOs that can both identify sound common knowledge management principles across all types of KIO and those that are more context-dependent, both in relation to the type of KIO and its business and cultural context.

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