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Knowledge management and business performance: global experts' views on future research needs

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Abstract

Purpose – This paper aims to examine the views of the global knowledge management (KM) community on the research area of KM and business performance and identify key future research themes.

Design/methodology/approach – An interview study spanning 222 informants in 38 countries was launched to collect data on KM expert views concerning the future research needs of the KM field.

Findings – The value contribution of KM requires more research despite experts agreeing on the complexities involved in solving this challenge. Further research areas identified were related to the influence of KM to support business strategy, intellectual capital, decision-making, knowledge sharing, organizational learning, innovation performance, productivity and competitive advantage.

Research limitations/implications – The sample is dominated by European-based KM experts and the self-selecting sampling approach that was used by relying on the networks of each partner could have biased the structure of this sample.

Practical implications – The recognition of the complexity to demonstrate the value contribution of KM could prevent practitioners from using over-simplified approaches and encourage them to use more advanced measurement approaches.

Originality/value – The paper is unique, in that it reports on the views of 222 KM experts from 38 countries representing both academia and practice, on the issue of future research needs in terms of KM and business outcomes. As such it provides valuable guidance for future studies in the KM field and related subjects.

Keywords Performance, Business strategy, Learning organization, Knowledge management, Intellectual capital, Competitive advantage

Paper type Research paper

1. Introduction

During the past few years, knowledge management (KM) has truly permeated the world of managing and organizing. Accordingly, the academic community is increasingly interested in the relevance of knowledge and its management in producing relevant research on value creation in the twenty-first-century organizations. However, what still seems to be missing from the current understanding is how exactly engaging in KM contributes to business value creation. KM is understood by this research as the “planned and ongoing management of activities and processes for leveraging knowledge to enhance competitiveness through better use and creation of individual and collective knowledge resources” (CEN, 2004b).

While the academic literature at large boasts a great many contributions, claiming an impact of KM on value creation (Gold *et al.*, 2001; Chuang, 2004; Darroch, 2005; Liu *et al.*,

“During the past few years, knowledge management (KM) has truly permeated the world of managing and organizing.”

2005; Gosh and Scott, 2007; Zack *et al.*, 2009; Andreeva and Kianto, 2012), there have also been dissenting voices, reporting either the lack of impact of KM on performance issues (Lucier and Torsiliera, 1997; Garud and Kumaraswamy, 2005) or a general doubt concerning its practical benefits (Booker *et al.*, 2008; Grant, 2011; Serenko and Bontis, 2013). While the business value is in doubt, analyst estimates suggest that US *Fortune 500* companies lose a total of \$31.5bn every year from the lack of proper knowledge sharing among employees (Myers, 2015). As a result, the topic of the relationship between KM and business performance remains somewhat shady, and indeed, according to a recent global expert survey, interviewing more than 200 KM experts worldwide (Heisig, 2014, 2015), this issue is considered as the prime gap in the existing knowledge on KM.

Lack of a clear understanding of the performance implications of KM can potentially pose a threat to the legitimacy and continuity of the field as a whole. In fact, providing further evidence of the impact of KM activities on organizational performance is widely seen as a necessity for the survival of the KM profession – after all, the only reason for managers to invest in KM is the expectation of some return on these investments. Also, educating future managers to deal with knowledge only makes sense in case there are reasonable justifications for expecting that this will make them somehow able to better navigate organizations. So fundamentally, the lack of evidence on the impact of KM on business outcomes can be seen as a threat for the KM field, calling into question the *raison d'être* of the entire KM field.

Therefore, the current paper addresses the views of KM professionals to examine what the key future research needs are in terms of this topic. Specifically, we analyze the interviews conducted among 222 KM experts from academia, business and the public sector, spanning 38 countries around the world. We proceed by first explaining the sampling, data collection and analysis procedures. Then we present the findings, organized along eight key themes that represent the global expert panel's understanding of the more specific research issues. We finally discuss the implications of our finding for the future of KM research at large and point out more specific research questions for future studies to address.

2. Research method

This research is part of a large, global research project aimed to establish a global research agenda for different research areas within the KM discipline (Heisig, 2015). This paper focuses on the aspects related to the business outcome or value contribution by KM which was identified as the most important challenge in future research by the panelists. As the overall approach and method has been reported elsewhere (Heisig, 2014), in the following, we briefly outline the background approach and mainly focus on the description of the methodology and analysis steps used for this paper.

2.1 Research approach and instrument

In total, 27 research partners from 26 countries used an explorative approach to gather input from an international panel of KM experts regarding advances, challenges and future research needs in KM. A semi-structured interview guide was conceptualized based on a previous Delphi study (Scholl and Heisig, 2003; Scholl *et al.*, 2004) and the core dimensions of KM frameworks (Heisig, 2009), as well as KM guides for practitioners from Europe (CEN, 2004a; BSI, 2001, 2003a, 2003b, 2003c; DIN, 2012) and Asia (AS, 2001,

2003, 2005; APO, 2009). The interview themes selected are also supported by domain analysis of the KM field (Nie *et al.*, 2009).

Interviewees were asked about their views regarding the advancements, current challenges and promising approaches in KM theory and KM practice (Scholl *et al.*, 2004; Scholl and Heisig, 2003) followed by their definition of the core concepts' "knowledge" and "knowledge management". The third part focused on the following eight dimensions "business outcome", "human and social enablers", "technological enablers", "KM processes", "organizational capabilities", "strategy", "organizational environment" and "knowledge economy" and "knowledge society". Reflection was triggered by thematic prompts, and experts were asked to explain the reasoning and provide for suggestions about potential research questions and methods (Appendix 1). A pre-test of the interview guide was carried out in Denmark and Germany with no further changes required.

The initial partners agreed on a purposeful sampling which aimed to include ten KM experts with a minimum of five years of professional experiences in KM per country, equally representing academia and practice. As the contribution from practitioners to KM research declined from nearly 50 percent in 1997 to 10 per cent in 2008 (Serenko *et al.*, 2010), we aimed to increase the relevance of the KM field (Booker *et al.*, 2008) by also including them as informants. In line with the interdisciplinary character of the KM field (Ponzi, 2002; Maier, 2004; Jasimuddin, 2006; Dwivedi *et al.*, 2011; Qiu and Lv, 2014), practitioners represented a wide set of different industries. The suggested and preferred format for data gathering was face-to-face or phone interviews. Some partners had to ask their KM experts for written input, as funding for data gathering was not available for all partners. Interviews were recorded, transcribed and translated into English if held in national languages by each partner. All transcripts and written input data were collected and integrated into Nvivo9. Input for the final data set was accepted until January 2014. Joining research partners were briefed by the coordinator about the study aims and introduced to the research instrument.

2.2 Sample

Our sample comprises valid answers from 222 KM experts. While interviews were conducted with 127 experts resulting in 6,900 min of recording time, 95 experts contributed in writing. The average KM experiences of the KM experts was 12.3 years. The sample comprises 77 per cent male and 23 per cent female experts. Tables I-VI provide the distribution of the main demographic variables of this global panel representing 38 nationalities.

2.3 Analysis

Data analysis was conducted over several steps (Figure 1). First, the interview data (transcripts from interviews and written statements provided by experts) were coded (Nvivo9) by the first author according to the sections of the interview guide and the interview questions (e.g. for business outcome D1 = D1a, D1b, D1c [. . .] to E). The data were extracted per section and forwarded to two research partners per section (B1 to E). In the second step, these two partners independently read the text and extracted major

Table I KM experiences in years					
<5 years	5-9 years	10-14 years	15-19 years	20-24 years	>25 years
10.4%	23.5%	29.4%	20.8%	6.3%	6.8%

Table II Started with KM in year				
Pre-1995	1995-1999	2000-3004	2005-2009	2010+
15%	28.8%	26.9%	19.2%	10.1%

Table III Regional distribution of KM experts

Europe: 52% (114)	America: 24% (54)	Asia: 14% (32)	Africa: 10% (21)
Austria, Bosnia and Herzegovina, Croatia, Denmark, Finland, France, Germany, Hungary, Israel, Ireland, Italy, The Netherlands, Poland, Portugal, Spain, Sweden, Switzerland, UK	Brazil, Canada, Chile, Colombia, Mexico, Trinidad and Tobago, Uruguay, USA	Hong Kong, India, Indonesia, Japan, Sri Lanka, Thailand	Egypt, Ethiopia, Kenya, Morocco, Nigeria, South Africa

Table IV Distribution of KM experts by roles

KM role	Practitioners			Academics			
	Internal	External	Director/Manager	Other roles	Professors	Lecturers or researchers	Other role in academia
	24.4% (54)	6.8% (15)	13.6% (30)	10.4% (23)	30.8% (68)	10.4% (23)	6 (2.7%)

Table V Sectorial distribution of KM experts

Business	Academia	Government	International organizations/NGO		
50.2% (111)	44.8% (99)	3.2% (7)	1.4% (3)/0.5% (1)		
Consulting and professional services 16.7% (37)	IT and software 9.0% (20)	Energy and raw material 5.4% (12)	Aerospace 3.6% (8)	Government 3.2% (7)	
Electric 2.3% (5)	Banking and Insurance and Finance, Chemical and Pharma Engineering and Capital goods each 1.8% (4)	Construction 1.4% (3)	Automotive, Consumer Goods, Food and Agriculture, Telecommunications, other services, other manufacturing each 1.4% (2)	Media and film and trading 0.5% (1)	

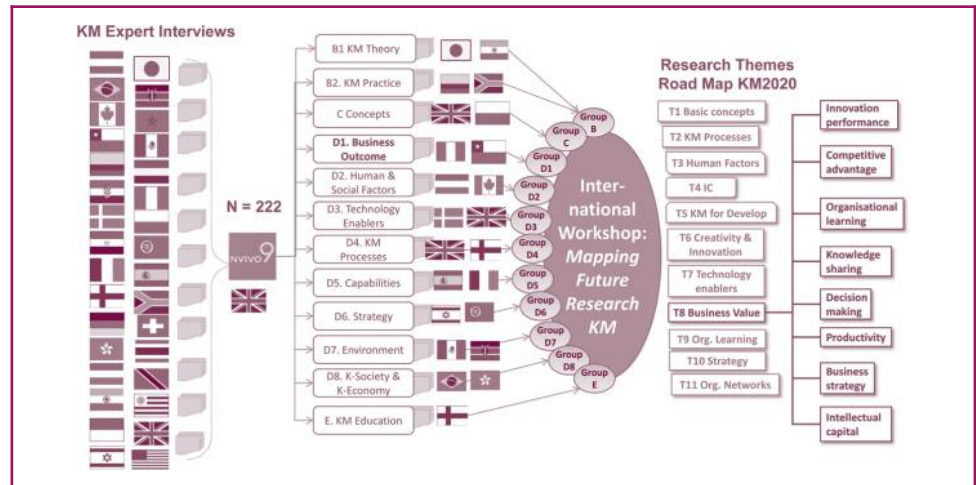
Table VI Distribution of KM experts by disciplines

Business and Management 32.4% (71)	Engineering 16.4% (36)	Information sciences 9.1% (20)	Computer sciences 7.3% (16)	KM 6.4% (14)
Economics, Sociology Each 3.2% (7)	Philosophy, Natural Sciences, Psychology Each 2.7% (6)	Business Information Systems, Law Each 1.4% (3)	Architecture, Geology, Political Sciences Each 0.9% (2)	Humanities, Languages, Art Each 0.5% (1)

themes from their readings (King, 1998; Strauss and Corbin, 1998). These two research partners met face to face at a workshop where they discussed their findings, checked their understandings and suggested research themes.

Following the workshop, the authors of this paper met again and discussed their initial findings and agreed to revisit the data to perform a second round of analyses. One co-author reviewed the entire data set related to D1 – business outcome based on the discussions among the author team. Eight themes were found in terms of how the interviewees suggested research themes related to KM and the business outcomes of organizations. These themes were cross checked and validated by other co-authors. They also contributed by describing the themes with quotations from the original statements of the KM experts being interviewed. These sections were peer reviewed by another co-author. The themes discussed in the findings section were therefore validated twice. Once by the first two researchers who independently analyzed the data and agreed on

Figure 1 An overview of research road-mapping process with themes



initial themes at the workshop and second, by the authors of this paper, who validated the eight themes derived from the second analysis. Figure 1 maps the process with the eight main research themes related to business value.

3. Findings

In this section, we report our main findings from the global expert panel regarding research needs around “KM and Business Outcome” which are illustrated with quotes from the experts. The quotes are coded starting with country code ISO 3166: AT = Austria, GB = Great Britain, followed by a number per country; the industry, role, years of KM experience; and the disciplinary background (see Appendix 2 for coding schema). Our result showed that more than anything else, the expectation of how KM contributes to business outcome appears as a priority among the KM experts as majority of the respondents (90 per cent) considered it as an important and essential future research area for the field. Actually, there is a clear view among KM experts from academia and organizational practice that the relationship between KM and business outcome requires further research. These views are captured in the following responses:

The impact of KM on firm’s performance is critical. If there isn’t any impact on results, it has no sense to invest in the improvement of Knowledge Management (ES-01-ITS-DIR-14-CTI).

Showing the link between KM and performance is important for the credibility of the KM field. It also would make engaging in KM more tempting for the firms (FI-01-HE-PRO-11-KM).

You were asking about the link between Knowledge Management and business value, and I said that’s highly important. And it’s got to be highly important because so many people are still asking that question. Well, I think it’s unanswered and unsolved. It’s obviously not answered and sold and publically visible to enough people (GB-01-CPS-EKM-20-GEO).

So the business case to show that KM improves organizational performance, whether that’s innovation or market share or whatever, I think that is still to be demonstrated. (GB-07-HE-SL13-SOC).

Organizations certainly would want to know how KM is related to business outcomes (HK-05-HE-PRO-6-OD).

If we do not clearly establish the linkage between business outcome and KM, organizations will not invest in KM. (IN-03-HE-PRO-10-BM).

Business outcomes should touch all aspects of the organisation and that’s why KM should be linked in to show its inherent value (PL-04-HE-SR-4-BM).

Given that nine out of ten experts regard further research as important or essential, the responses above illustrate that more evidence regarding the value contribution of KM is required despite what has already been achieved as the following experts recognize:

There is already a lot of academic research and numerous examples of organisations who have shown that KM is the key to their success. I consider this research to continue to be highly important so that appropriate research outcomes and statistics can be used and applied in business organisations which have not embarked on KM or are not putting enough emphasis on KM. The research will also help KM to gain recognition as a discipline and business strategy in its own right (HK-04-CPS-OB-6-LAW).

Attempts have been made to develop theoretical models that link KM to individual and organizational performance but still there is need for further investigation. (MA-01-HE-PRO-12-BM).

The challenge will become a Herculean task of demonstrating the relationship between KM and business value, especially if the research approach adopts an understanding of knowledge as highly interwoven into practice (Gherardi, 2006) as this expert points out:

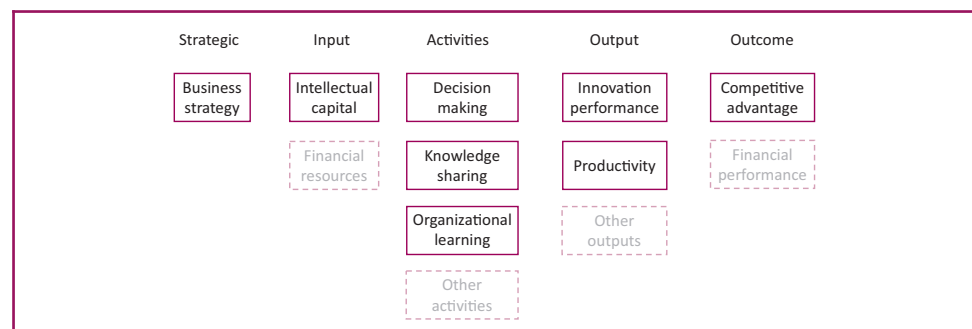
[. . .] the moment you move to a view that says that, knowledge is interwoven into practice and these things, then your problem is, that [the relationship between knowledge and business outcome] can't demonstrated like that, because it's mediated through so many things that you can't demonstrate one-to-one" [relationship] (ZA-03-HE-SL-13-PHI).

The experts' opinions above notwithstanding, a closer scrutiny of the experts' responses about future research needs concerning the intersection of KM and business outcomes can be categorized into eight key themes whose findings we discuss in the following sections. These themes are: *business strategy* (3.1.), *intellectual capital* (3.2.), *decision-making* (3.3.), *knowledge sharing* (3.4.), *organizational learning* (3.5), *innovation performance* (3.6.), *productivity* (3.7.) and *competitive advantage* (3.8.) Each of these is reported below, along with suggestions on more specific research questions concerning each theme's future research needs (Figure 2).

3.1 Business strategy

Experts' observations on the relationship between KM and business outcome indicated that scholars believe that KM should have a proper link with company's business strategy. According to one of the experts: "Well, I think one of the problems in doing knowledge management and understanding this, is that actually many organizations have pretty weak understanding of their own strategy and their own business models. So, from a KM practitioner point of view, it's actually really difficult to connect your activities to strategy,

Figure 2 Research themes suggested by the global panel



when it's actually not clear what the strategy is in the first place" (CA-03-CPS-EKM-12-BM). In buttressing this point, another expert said he found it "interesting in this day and age that people will move forward with a bunch of knowledge management activities, or with some knowledge management activities, and not have a strategy. I still don't understand how people jump in with the tactics, and don't understand where they're going with it. They don't have a strategy, don't have a road map to say this is where we want to go with it, this is what we're going to undertake" (CA-09-CPS-EKM-13-BM).

As a way forward out of the doldrums, an expert advised that "the first step to take is to get a business strategy, and then get a knowledge management strategy and see how both of them and if both of them can be linked together". He further states that "the need to compare the timelines and the project plans, what should be put as action that can aid the synergy together" (ZA-07-NA-HKM-NA-NA).

As a suggestion on how KM and business strategy can be synergized, some of the experts believed that the best approach is to link KM to business outcome, figure out the steps involved and then set empirical benchmarks for a desired business outcome. However, experts observed this is not often the case: "Rather than not having that link. All too often, it seems to me, organizations don't have that link, and those are very often the ones that fail, and fail miserably" (CA-09-CPS-EKM-13-BM). Therefore, the experts seem to have their strong opinion that: "For KM to flourish in an organization, there is a need to have a strong linkage between knowledge strategy and business strategy and ultimately this should be tied to the business outcomes" (HK-02-HE-PRO-24-ENG). As strongly expressed by another respondent, "I believe that for the advancement of management [. . .] there is a need to demonstrate the specific effects of the implementation of an organizational strategy that goes through knowledge management". Asking the question from the point of view of the entrepreneur would be "I have to win with/through knowledge management?" (PT-05-HE-OA-5-PSY).

In summary, future KM research needs related to business strategy should address:

- How KM can be used as a business strategy in facilitating financial performance?
- Differentiating between different KM strategy, namely, knowledge development (knowledge is the subject of attention), knowledge utilization (routines are subject of attention) and knowledge capitalization (profit is the subject of attention) and their implication for business performance.
- Empirically demonstrating specific impacts of KM strategy on organizational strategy and financial performance.
- Identifying KM intermediate variables of business performance that directly lead to financial performance.

3.2 Intellectual capital

Given the need articulated to determine the impact of KM on business outcomes, some experts advocated to advance research in the understanding of intellectual capital (IC) of organizations: "Anything that contributes to a better understanding of the link between knowledge management (operational level) with the intellectual capital (strategic level) and its measurement" (PT-07-HE-PRO-10-ECO).

“Lack of a clear understanding of the performance implications of KM can potentially pose a threat to the legitimacy and continuity of the field as a whole.”

“Established themes like strategy, decision-making, organizational learning, productivity and competitive advantage warrant new attention from a KM perspective.”

It is expected that this KM research strand on IC can profit from the current discussion about integrated reporting (Abhayawansa, 2014; Beattie and Smith, 2013; Ragab and Arisha, 2013) which aims to provide information “about an organization’s strategy, governance, performance and prospects in a way that reflects the commercial, social and environmental context within which it operates. It provides a clear and concise representation of how an organization demonstrates stewardship and how it creates and sustains value” (IIRC, 2011). In justifying this line of argument, the experts are of the opinion that: “It is highly important because business outcomes of growth need to be analyzed from many different perspectives of capital (financial, intellectual, etc). and these perspectives are related with intellectual capital approaches” (MX-03-HE-PRO-15-BM).

Furthermore, a dynamic perspective is required as social–economic–political contexts change and business models and business strategy have to evolve. Hence, the experts believed that IC research is not only relevant to improve the understanding of the interplay of the elements which produce value but should also include a dynamic view. To this extent, they are of the view that the proposed IC model should: “[. . .] not separate from traditional and physical assets but an integrate way to see how all value elements interplay [. . .]”. As a means of achieving the integration, the experts emphasized the need to address the challenge of maintaining a balance. “[. . .] Another important element is the dynamic of the balance. We have no manner to model how balance is maintained for strategically steering the organization according to how the important elements evolve over time and the context, therefore it represents challenges and opportunities to see” (MX-01-HE-PRO-23-PSY).

Approaching the benefit of KM to business value through the IC models could also help improve the understanding of the complexities of organizations and the network of interactions between the different factors. This line of argument is well supported by the experts who believed that IC model could “allow a better understanding of the complex and multidimensional reality of knowledge processes in the organization. Along these lines, it is important we have a multidimensional measurement system that expresses the complexity of the intellectual value of the organization (i.e. intellectual capital)” (ES-06-HE-PRO-16-ECO).

Within this context, the experts see a need to further investigate the “indicators of relational capital, human capital and other intellectual capital metrics” (ES-03-CPS-EKM-17-KM) to provide managerial practice with reliable and useful measuring approaches.

In summary, future KM research related to IC should address:

- research on IC approaches to understand the impact of KM on business outcomes;
- establish the role of knowledge and IC within integrated reporting approaches;
- understand the impact of KM by uncovering the organizational complexity with IC approaches; and
- design and test IC indicators for organizational practice.

3.3 Decision-making

Decision-making processes are one of the most important activities of managers in companies and one that can make the difference between success and failure (Litvaj and

Stancekova, 2015). Hence, the experts in this study have identified three areas in this regard. First, in a globalized world, an organization requires more sophisticated mechanisms and techniques to properly deal with fuzzy uncertainty in a changing environment. In this context, the experts in this study believed that KM appears as a powerful tool to provide more and better information as a result of collaboration from the firm's knowledge workers and accessibility to various internal and external knowledge resources networks which can lead to improved quality decision-making process: "This is fundamentally what KM is about – improving the ability of an organization to make better decisions and develop better solutions to challenges (through the creation of 'new' knowledge) that leads to improvement in business performance - through an improved ability to leverage what you know about what you do" (USA-02-CPS-EKM-15-KM).

Second, the experts believed that, knowledge from past experiences should be considered a critical asset for organizations, as it may be utilized not only to enhance the decision-making process but also to be considered as the foundational base of the business strategy as pointed out by this respondent: "If KM is using past data to inform future decisions, then the organization that can readily call upon data for analysis will possess a decisive strategic advantage over its competition" (TT-03-CON-IKM-9-OB).

Third, the experts in this study are of the opinion that KM can act as a vehicle for employee networking and coordinating organizational learning through which knowledge transfer can be achieved. They equally believed that through KM, participatory decision-making based on the knowledge context of a business scenario can be easily achieved. Such participatory decision-making according to Pittaway *et al.* (2004) has been strongly linked to innovation, as they have a key role in the creation of new knowledge and decision-making. As a result, the experts in this study are of the opinion that: "The decision making processes in organizations increasingly need multiple approaches and are based on network knowledge. These capabilities can be developed through KM" (BR-04-GOV-OB-14-OD).

In summary, we envisaged future KM research needs of how KM can aid decision-making in organizations to address:

- KM tools and techniques that can facilitate timely decision-making in an organization.
- KM impact on different levels of organizational decision-making processes.
- Demonstration of KM as a driver of networks for learning through knowledge transfer.
- KM impact on operational efficiency and effectiveness in an organization.

3.4 Knowledge sharing

One of the critical issues in organizational learning (OL) is knowledge sharing. OL has its premise on the principle of knowledge being able to be shared among employees for personal and organizational empowerment. Hence, with regard to the impact of knowledge sharing on business outcomes, experts in this study asserted that knowledge sharing positively affects organizational performance and quality of decisions made in organizations. This assertion is well illustrated by some of the respondents:

"Business outcomes can be demonstrated to be – at least partly – related to knowledge exchanges with in or out an organization, Knowledge sharing certainly makes a difference

"Intellectual capital approaches are a promising new research strand with the focus on non-financial drivers and their complex interactions influencing organizational outcomes."

in terms of performance of an organization" (*TH-06-CP-KPM-1-KM*). Knowledge sharing also "facilitates the organizational learning process that lead to the creation of intelligent organizations" (*ES-06-HE-PRO-16-ECO*).

Hence, the experts believed that "most of organisational problems results from the absence of connection between departments, and staff. There is no knowledge sharing between them, or even database contains records for each event, or process. The department gets incomplete information, which means inaccurate decisions" (*ET-01-HE-PRO-6-BM*).

Moreover, the experts also believed that even in organizations where knowledge-sharing practices have been successfully adopted, the quality of knowledge being shared in many organizations is questionable: "which is to look at, knowledge transfer initiated by questions, versus knowledge transfer initiated by offerings. Which is the more effective and which is the more efficient?" (*GB-01-CPS-EKM-20-GEO*). In addition, the experts are also bothered by the difficulty of measuring the outcomes of knowledge sharing and measuring the quality of knowledge being shared: "If you just talk about KM and performance, you have to measure the two variables. Can you measure knowledge sharing, can you measure the quality of knowledge?" (*GB-07-HE-SL-13-SOC*).

The majority of the experts are also of the opinion that most knowledge-sharing barriers are human-oriented than technology- or process-oriented. They argued that it is difficult to push people to share their knowledge, as people tend to believe that knowledge is an individual power: "Knowledge is power. Nobody would like to give off his power. So at the end of the day it's a cultural change. [. . .] We still struggle to get knowledge out of people. People still don't share. It's a cultural thing, it's a behavioural thing" (*ZA-01-GOV-KPM-5-OD*).

Hence, as a means of encouraging people to share their knowledge, experts proposed some form of compensations ranging from incentives to recognition and building knowledge sharing culture in organizations: "you need to compensate people for sharing knowledge. I remember from the work we did at Jo'burg University was around what are other companies doing around incentives" (*ZA-01-GOV-KPM-5-OD*). "Take ConocoPhillips for example, they've been in the MAKE Awards 10 times. Every year they publish a whole set of success stories in knowledge management. And what would be really interesting would be to go to those people in the success stories, and ask them – why did you behave in this way? What were you thinking that led you to share with others, or ask others for help? What were the things that influenced you to do that?" (*GB-01-CPS-EKM-20-GEO*).

Also, experts were of the opinion that "By creating a culture of knowledge sharing, one contributes towards enhancing the knowledge level of the organization" (*IN-02-CPS-OB-16-BM*). They also pointed out that "As a company, we can only show our value when we really listen to people's problem at a microscopic level, which needs to be a part of our overall business outcomes" (*DK-05-CPS-IKM-5-CIT*).

In summary, future KM research related to collaboration and knowledge sharing could address:

- Ways to investigate the quality of knowledge being shared.
- Ways to measure the outcomes of knowledge sharing.
- Ways to encourage employees to be involved in the knowledge-sharing process.
- Ways to create knowledge sharing culture within the organization.

3.5 Organizational learning

Tushman and Nadler (1986, p. 75) had pointed out that innovative organizations are known to set up a "highly effective learning system". Hence, firms that are thriving in today's global competitive environment see themselves as learning organizations pursuing the objective of continuous improvement in their knowledge assets (Senge, 1990). To establish how OL

can contribute to business value of an organization, experts' opinions were sought. Some of the respondents believe institutional learning should be a major issue in KM research, as it linked to how an organization can drive innovation in an organization.

According to a respondent, "A major research issue in knowledge management is institutional learning, which addresses how institutions make explicit and thereby collectively imbibe knowledge produced as a consequence of historical occurrences" (NG-05-ITS-DIR-10-IS). To another respondent, "I guess it's how KM relates to organizational learning and organizational innovation" (CA-01-HE-PRO-14-IS). From the findings, it was obvious that the experts see KM as a key to developing a "learning and teaching organization" (IN-02-CPS-OB-16-BM).

However, some are of the opinion that it is not all that easy to become a learning organization or to implement institutional learning and that only few have been thus successful. They believed that, becoming a "learning organization" requires a business strategy and proven transitional processes: "[. . .] on the transitional processes for becoming a learning organisation, only a few organisations have managed becoming learning organisations but many disappeared. IBM has gone already through 3-4 crisis only due to its ability to learn and adapt. Digital didn't learn. Intel too changed course at the last moment" (IL-03-HE-SL-28-BM).

Hence, to overcome this challenge, it was suggested that e-learning be used as a medium of KM activities in organizations. According to a respondent, "Another aspect of this might be looking at the issues around learning. Bringing e-learning into the organization. Bringing Just-in-Time learning into the organization" (CA-05-CPS-DIR-13-1S). However, the experts' findings revealed that whatever method that might be adopted, there is the need to address the performance impact of KM in OL activities: "Why do I invest in these things? Why do I put money into a learning management system? Why do I put money into courses and coursework and training people? You need to be able, as a CEO, to see direct benefit from those things and a connection between those things and my bottom line" (CA-05-CPS-DIR-13-1S).

In summary, judging from the fact that organizations would have a competitive advantage by increasing the learning capacity of its knowledge workers (Nonaka and Takeuchi, 1995), KM future research needs as related to OL might address:

- Organizational KM framework for implementing learning system for business outcome.
- How KM can act as a mechanism for improving OL.
- What kind of learning tools and technologies could be utilized for KM activities.
- Cost-benefit analysis of institutionalizing KM learning management system in organizations.
- How KM and OL impact organizational performance, especially in terms of financial performance.

3.6 Innovation performance

Owing to the desire of linking KM to a whole spectrum of business outcomes and as a means of demonstrating the relationship between KM and business value, KM experts in this study suggested the need to advance research on the link with innovation performance. Some of such responses are illustrated below:

Actually again, another sort of field that it could be interesting to link to is being the sort of innovation field, which ties into the knowledge creation process (GB-08-HE-PRO-30-BM). ([. . .])

We need to look at knowledge management and how that advances innovation (ZA-09-HE-PRO-8-ENG).

I think we must research the combination of knowledge management models to current economic mobility issues, such as entrepreneurship and innovation (MX-02-CPS-EKM-13-CIT). [. . .]

Knowledge management for innovation, because our organization wants to consolidate the KM process as the key process needed to obtain concrete results in innovation (CO-04-ERM-IKM-5-BM).

Innovation performance as a KM strand seems highly desirable given the fact that KM and innovation are closely interwoven. The importance of this link was highlighted by some of the experts: "I would say 'Highly important' because innovation is central here. Knowledge management is closely interwoven with it" (DE-04-HE-PRO-15-BM). Elaborating further on this, some of the experts believed that: "Innovation is one central topic, innovation management which could be improved by knowledge management" (DE-06-HE-PRO-23-BM). Hence, "There is need for analysis of the direct relationship between knowledge and innovation" (ES-06-HE-PRO-16-ECO).

Prodding further, an aspect of innovation that demands mentioning here and which some of the experts made mention of as a critical link to deriving business outcome from KM is time-to-market or what [Kessler and Chakrabarti \(1996\)](#) termed "innovation speed". According to one of the experts: "Speed to market is the name of the game. Innovation is the key differentiator. Innovating speed will give the competitive advantage. KM holds the key to achieve the objective" (IN-02-CPS-OB-16-BM). To another expert, "innovation speed" is very critical "simply because whoever does it earlier will have the first-mover advantage over those who later on catch up" (CA-04-HE-PRO-9-ECO). Hence, "Competitiveness is an important aspect. KM will improve the competitiveness by helping the organizations to improve response speed and by being innovative" (LK-01-ITS-CKO-8-ENG).

As a result, we believe that empirical investigations on how KM could help in innovation speed would be promising given that time-to-market is critical in providing competitive advantage in today's highly competitive business environment. More so, our panel of experts believed that "the purpose of managing or governing organizational knowledge is to create innovation and core competencies in the organization" (ES-06-HE-PRO-16-ECO).

Summarizing our findings from the responses of our interviewed experts, we believe that future KM research needs related to innovation performance should address the following research gaps:

- How managing knowledge can advance innovation as a business outcome.
- Further empirical investigation on the interplay between KM and innovation performance.
- Research on KM and how it contributes to innovation speed.
- How innovation enhances knowledge-creation process in organizations using KM, entrepreneurship and innovation models.

3.7 Productivity

Exploring innovation strategy in organizations through OL which informs collaboration and sharing of knowledge to make sound and informed decision boils down to achieving productivity and profitability in organizations. Productivity and profitability, which is a function of business performance, are two terms although strongly associated with competitive advantage are often used interchangeably. Hence, KM which has its primary objective in cutting cost and increasing revenue could also be seen as a function of productive advantage which, in most cases, often enhances organizations' profitability. However, the direct and the indirect contribution of KM toward an organizational productivity and profitability has been a subject of controversy among scholars in extant

literature. It is on this basis that experts' opinions were sought to see the future trend in this respect.

While some experts believe, "it could be useful to examine the difference in profitability only between companies using much KM and those using less KM" (DE-09-CP-OB-5-NAT), others are of the opinion that judging by the very fact that productivity, profitability and competitive advantage are closely linked together, the differences in KM emphasis in organizations should not only be about profitability but rather should include "productivity and competitiveness, as well" (CA-04-HE-PRO-9-ECO). Hence, it is believed that, "whatever that slight margin is, it is an understanding that could contribute quite significantly to profitability, competitiveness, etc." (CA-06-HE-PRO-12-IS).

Managing knowledge as a basis of measuring organizational productivity and profitability is premised on the fact that today's organizations are operating in a knowledge-based economy. As highlighted by a respondent, "because knowledge is absolutely of critical importance to the future of our global economy. We're operating as a knowledge-based economy. Therefore, we need to understand those factor inputs, knowledge inputs that in a digital and network society globally impact growth, competitiveness, profitability and sustainability" (CA-08-CPS-DIR-13-BM). Hence, according to a respondent, "Managing organizational knowledge will enhance productivity, because instead of spending time reinventing the wheel, which takes far more time than having at least a very good start, that will increase productivity and, therefore, profitability" (CA-10-CPS-EKM-16-SOC).

Besides, some experts believed that "due to crisis in economy, owners, shareholders, managers are searching for new sources of cutting costs and gaining profits. This is why KM may be perceived as a means of profitability" (PL-03-HE-SL-20-SOC), and, as "a company's bottom line remains, and will remain, the main driver, a method and approach that does not deliver to the bottom line does not have a future" (TH-02-CPS-IKM-3-KM).

However, some of the respondents express their reservations as to why it might be difficult associating KM with profitability, productivity and competitive advantage. This is because, "[. . .] competitiveness, profitability will be very difficult to assign causality to [. . .] knowledge management is closely interwoven with other tangible issues" (DE-04-HE-PRO-15-BM). Hence, the need for "business outcomes of growth to be analysed from many different perspectives of financial, intellectual and other intangible means" (MX-03-HE-PRO-15-BM).

From the foregoing, it is obvious that future KM research needs related to KM and productivity should address:

- Causal relationship between KM initiatives' level of implementation and business outcome.
- Measurable indicators for measuring direct and indirect contributions of KM to business outcome.
- Analyzing the business outcomes of KM from both financial and non-financial perspectives.
- Differentiating contributions of KM toward related terms of productivity, competitive advantage and profitability.

3.8 Competitive advantage

Having seen the need for innovation performance and innovation speed as a critical component of KM that could give competitive advantage in driving business outcomes, the experts in this study further advocated further.

"Knowledge management could be one of the critical pieces, one of the lynch pins in competitive advantage. An understanding that could contribute quite significantly to profitability, competitiveness, etc. and that that's the one piece that could be leveraged

much more effectively [...] relative to business outcomes” (CA-06-HE-PRO-12-IS). Prodding further by one of the experts: “I think most pressing is the strategic question of how knowledge management or the nurturing of the knowledge base contributes to building competitive advantages” (DE-04-HE-PRO-15-BM). Not done yet, another respondent retorted “[...] we know what the link is. We know there is a link. What we’re not able to do is necessarily say exactly what ([...]) (GB-06-AE-IKM-25-ENG) and “how KM contributes to competitiveness? (KE-03-HE-SL-5-BM).

Hence, as a means of helping to resolve this challenge, some of the experts believed that establishing “Cause-effect relationships between KM activities and competitiveness” (ES-04-CPS-EKM-15-BM) will be essential, as this will help in addressing the critical question of “How to best use KM to develop strategies for taking advantage of market conditions for the organization?” (USA-01-GOV-IKM-19-ARC). Thus, a deeper understanding of how firms can strategically manage knowledge to create and sustain competitive advantage is desirable. For instance, there is a need to know if competitiveness of firms could be attributable to proficiency in KM.

Moreover, the experts are also of the opinion of the need to explore the interplay between strategic management, entrepreneurship and innovation as elements of KM in achieving competitive advantage: “More generally speaking I would say that knowledge management is embedded today into three disciplines such as Organization studies where is always was and now is also stronger linked to strategic management research and as a third in the area Innovation and entrepreneurship research. And here the new topics are emerging. The particular impulse is the combination [...]” (DE-04-HE-PRO-15-BM).

Also, the experts, while reemphasizing the competitive nature of knowledge, believed that different combinations of knowledge from diverse sources could confer a competitive advantage: “Knowledge is the new key resource and the single most important part of competitiveness in a knowledge economy” (DE-15-HE-PRO-22-POL). “Well, for example, from a competitive perspective, depending on where you are in the world and your access to various resources, you may find that different combinations of knowledge will give you a competitive advantage over someone else. So, if you’re in a first-world country, you may rely a lot on encapsulated and codified knowledge. If you’re in a developing economy, it may be more economic, for example, from a competitive perspective to rely more on tacit knowledge of your employees” (CA-04-HE-PRO-9-ECO). This demonstrates the dynamism view of knowledge from an economic perspective in the knowledge-based economy. It is therefore desirable to attempt to investigate such variability, especially, as [Andreeva and Kianto \(2011, p. 1029\)](#) lamented the scarcity of research in this area when they reported that: “no studies that contrast the amount of tacit vs explicit knowledge used in more or less knowledge intensive businesses”.

In summary, future KM research needs related to competitive advantage should address:

- contribution of KM to organizational competitiveness;
- role and contribution of KM in the interplay of strategic management, entrepreneurship and innovation; and
- research on the variability of knowledge (tacit and explicit) in more or less knowledge-intensive enterprises and their respective contributions to business value.

4. Discussion

Overall, the findings of this study suggest that further research on the relationship between KM and business outcomes is required. The experts in our global study were unanimous in their opinion that the question “where does knowledge management add value” ([Chong et al., 2000](#)) still warrants a comprehensive answer. Existing research mainly has tried to understand the effects of knowledge management systems (KMS) onto organizational performance ([Feng et al., 2004](#); [Khalifa et al., 2008](#)), tested the effect of knowledge

processes onto financial performance measures (Lee *et al.*, 2005), assessed the short-term impact of public announcements of information technology (IT)-based KM efforts on the firm value (Saberherwal and Saberherwal, 2005; Choi and Jong, 2010), etc. The challenge to provide a business case for KM on the “treatment of knowledge as a system of interconnecting internal capabilities (business enablers) of a company, such as social and cultural enablers, leaderships and human development tools, compensation schemes and technological infrastructures, with knowledge representing the understanding of the relationships and interactions between business assets” (Chong *et al.*, 2000) has hardly been tested in research or in business practice. A recent study by Mousavizadeh *et al.* (2015) still strongly linked to an object-based view on knowledge, aimed to integrate important enablers such as culture and management support into the assessment of the benefits derived from KM. The complexity involved in such an integrated approach will be even increased, if knowledge is understood as somewhat interwoven with practice (Assudani, 2005; Gherardi, 2006), and with its indirect benefits to business value (McPherson, 1994). In such cases, it might be very difficult to assess or even measure the link between KM and business value.

Given this complexity and the ubiquitous character of knowledge in social and organizational life, the results and suggestions derived from our global panel of more than 220 KM experts might not come as a surprise. While the experts agreed on the need for further research, the different emphasis placed does reflect the somehow scattered character of the research undertaken. We classified the need for future research articulated by the KM expert panel into eight themes: business strategy, IC, decision-making, knowledge sharing, OL, innovation performance, productivity and competitive advantage. We suggest that research in these areas could demonstrate the diversity of value created by KM activities.

While the experts brought up research needs related with the eight categories identified above, it seems that some of these have been rather extensively studied already within the existing literature. As KM is a very wide, multi-disciplinary and heterogeneous field, it is understandable that the experts in the panel were not fully cognizant concerning the existing research evidence related with all of the themes. In the discussion below, we relate the interview findings with what already exists in the literature. We first discuss the themes which already have received rather extensive attention, and then move to those themes which seem to be genuinely lacking in research.

Knowledge sharing was brought up as one of the needed key research foci among our panel members. Indeed, the importance of knowledge sharing for organizational performance is widely recognized also in the KM literature (Nahapiet and Ghoshal, 1998; Hansen, 1999; Dyer and Nobeoka, 2000). For example, according to Bock and Kim (2002), encouragement of knowledge sharing is the most important function of KM, and it not only enables better utilization of existing organizational knowledge but also is the key to knowledge creation and innovation (Nonaka, 1994; Nonaka and Takeuchi, 1995). In fact, knowledge sharing is, according to several reviews on KM literature (Hislop, 2010; Edwards *et al.*, 2009), the most studied of organizational knowledge processes, and the wide literature on this topic ranges from individual to interpersonal, organizational and cultural antecedents and outcomes (cf. Wang and Noe 2010; Israilidis *et al.*, 2015).

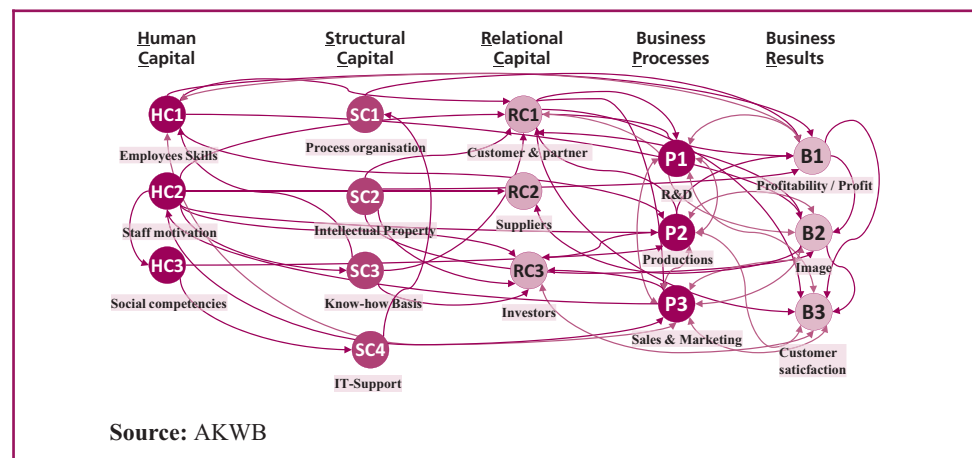
Studying the influence of KM on innovation has a long tradition within different disciplines. Early research (Coombs and Hull, 1998) pointed to the multiple and growing “menu” of KM practices available to organizations to choose from for furthering innovation and suggested to apply the lens of KM practices, rather than only through categories of knowledge or technology in further empirical research (Coombs and Hull, 1998). Several early literature reviews (Corso *et al.*, 2001; Adams *et al.*, 2006; du Plessis, 2007) suggested different value propositions of KM in the innovation process, ranging from creating tools and processes to exploiting tacit knowledge for innovation, to supporting collaborative problem-solving (Nickerson and Zenger, 2004), enabling retrieval and re-use of ideas and learnings from

previous innovations up to the influence of an open-minded KM culture, fostering creative thinking. A bulk of empirical studies has addressed and indeed validated the impact of KM as an important enabler and facilitator of innovation in organizations (Darroch, 2005; Aboelmaged, 2014; Inkinen *et al.*, 2015). Overall, even though the experts in our panel perceived a need for studying KM and innovation performance, it seems that in fact the existing literature already has quite well covered this area.

The classic texts grounding the knowledge-based view of the firm in the 1990s (Kogut and Zander, 1992; Nonaka and Takeuchi, 1995; Grant, 1996) already posited that knowledge and its management form the key bases for sustained competitive advantage across firms. Thus, in this sense, the realization that KM is linked with competitiveness is not novel at all. Furthermore, theoretically, the theme of competitive advantage has linked, e.g., with tacit knowledge (Nonaka, 1994; Nonaka and Takeuchi, 1995; Lubit, 2001) and knowledge transfer (Argote and Ingram, 2000). Also, some empirical studies with an explicit focus on the effects of KM on competitive advantage have been conducted (Ndlela and Du Toit, 2001; Danskin *et al.*, 2005; Andreeva and Kianto, 2012; Kianto *et al.*, 2013). However, these typically have been cross-sectional studies, meaning that genuinely *causal* research designs are lacking in the field. Furthermore, there seem to be no studies addressing the *sustainability* of competitiveness, from a temporal perspective. Thus, future studies should use longitudinal approaches, collecting the information concerning the resultant competitiveness after examining the KM exercised in the firm.

Research on IC has been quite extensive over the past two decades (Petty and Guthrie, 2000; Andriessen, 2004; Heisig, 2005; Suraj and Bontis, 2012; Guthrie *et al.*, 2012; Dumay and Garanina, 2013). Despite these efforts, IC approaches have not yet become a standard in organizational practice, and thus, the key interest within this discussion has recently turned toward how IC is used by firms in practice (Demartini and Paoloni, 2013; Dumay, 2016; Chiucci and Montemari, 2016). The learnings from over a hundred applications of the IC instrument “Intellectual Capital Statements – Made in Germany” (Mertins *et al.*, 2005; Edvinsson and Kivikas, 2007; Alwert *et al.*, 2009; Galeitzke *et al.*, 2015) with its the EU follow-up project or “ICS – Made in Europe” (InCaS, 2008) in small- and medium-sized businesses in Germany and five other European countries since 2004 show that several factors influence the bottom line and that different KM interventions address different factors (Figure 3). Only the re-use of certain knowledge assets could have a direct influence with regard of saving re-work and improving the productivity. KM interventions mostly have an indirect influence and therefore the expectation of KM providing a straight, clear-cut impact onto the “bottom-line” should be replaced by a more differentiated understanding of the indirect effects on the business. A more differentiated perspective

Figure 3 Interdependency map from IC statement of a medium-sized enterprise



could help to design and undertake more focused research addressing the different dimensions KM interventions that could influence as proposed by this research. These pieces of evidence could be merged and combined to an overall mosaic of the different business benefits KM interventions could provide to organizations.

The visualization of the complex interdependencies of the IC factors (human, structural, relational capital) on the business results via the main business processes was considered by the pilot companies as being of huge value to understand the business, to communicate about these mechanisms and to evaluate and “play” with different options of improvement measures decided by the management. The pilot partners demanded that this feature be implemented into the ICS-Toolbox. This observation from several hundred applications also indicates that the complexity involved into the assessment of the business value of KM and KM-related management action still warrants more research.

The concept of OL is closely related to that of KM (Easterby-Smith and Lyles, 2003; Firestone and McElroy, 2004; Spender, 2008), but the effects of KM and OL on performance have not been much researched. This is surprising, as the well-known “learning” or “experience curve” might suggest a relationship between increasing knowledge through learning leading to better performances. Only a few studies aimed to look at these relationships but mainly at the level of individual learning processes (Lee and Choi, 2003; Edmondson *et al.*, 2003; Lapré and Van Wassenhove, 2003; Reagans *et al.*, 2005).

The theme decision-making in the context of KM and firm performance links us to two main research strands in the literature. One strand discusses decision-making in the context of the knowledge-based theory of the firm (Grant, 1996), while the other in the context of management decision-making (Bond *et al.*, 2008) and IT-based decision support systems (DDS) (Holsapple and Joshi, 2001). Capturing and learning from past decisions are seen as overlapping features between KM and DDS and a foundation of the latter (Jones, 2006).

An important learning on management decision-making provides the analysis of the disaster of space shuttles Challenger and Columbia, as ignoring the advice from experts within the organization led to the loss of lives (Garrett, 2004). This learning points toward the aspect of risk, which was hardly addressed by our panel. Recently, a framework was proposed to improve the decision-making capability of organizations by using KM (McKenzie *et al.*, 2011). Research showed that the success of KM and information systems is influenced by how good these applications are adapted to the national decision styles of the users (Martinsons and Davison, 2007). Given the rich research tradition in management and decision science, as well computer science, KM research could exploit these root disciplines further to advance the understanding of the link between knowledge, KM and decision-making toward performance with its different dimensions and attributes.

A surprising element from our analysis is the lack of risk perspective articulated by the experts in relation to the business value of KM given the huge losses and damages cause by not properly managing knowledge. Only two experts pointed out that “KM has to be accepted by leadership as an effective tool to produce results and to reduce risks and not only as a way to retain organizational knowledge. That is the only way KM will be accepted as management tool” (BR-03-ECM-IKM-6-NA), and research should look at “how to measure the impact (Short and Long Term) of KM on Business outcomes and on Risks Mitigation” (TH-04-CPS-DIR-NA-KM). Early suggestions regarding research into the use of KM to reduce risk (Chong *et al.*, 2000; Cooper, 2003) are yet to be recognized by the different communities including the global KM community (Massingham, 2010). While Cooper (2003) advocated the use of KMS and Chong *et al.* (2000) emphasized the cultural and leadership aspects, reflection on this research, we would suggest that in addition, the human factor element in accepting and using knowledge about failures and risks needs to be added to a technological perspective.

One important output measure is productivity which has been linked to knowledge and learning in psychology and pedagogy (Ezey, 2000) and in economic research labeled the learning curve (Anzanello and Fogliatto, 2011; Fioretti, 2007). Research related to KM in this area is scarce. A few studies have provided evidence about positive effects. Dyer and Nobeoka (2000) identified the positive effect of knowledge sharing at network level between Toyota and their suppliers, while Lapré and Van Wassenhove (2001) on productivity improvement in factories. Other research indicates that in the second year after adopting KMS, administrative costs significantly reduced and productivity improved and that KMS adopters indeed gain a competitive advantage over non-adopters. (Feng *et al.*, 2004).

The review by Al-Laham (2003) showed that the relationship between business strategy, knowledge strategy and business outcome (competitive advantage) has hardly been researched. Early prescriptive studies provided first suggestions for knowledge-based strategies (Wiig, 1997; Hansen *et al.*, 1999). Choi *et al.* (2008) studied different knowledge strategies (explicit–tacit and internal–external) and their relationship with organizational performance and identified three types of complementarity: non-complementarity, non-critical symmetric complementarity and asymmetric complementarity. The integration of explicit- with tacit-oriented KM strategies suggested a drag on performance, while companies could benefit from external-oriented or internal-oriented strategy. Smith *et al.* (2010) showed that business strategy and knowledge process capabilities have a greater impact on organizational effectiveness than infrastructure.

By learning from other disciplines, the KM community should use more review studies and meta-analysis to derive more evidence from existing research to contribute to the question about the business value or added value of KM. More reviews such as Inkinen (2016) on empirical research on KM practices and firm performance would profit the discipline and practice. This would also require more collaborative undertakings, as it is usual in the medical research community with many more authors contributing because it is currently the norm in business and management studies and journals.

Furthermore, as knowledge-based value is likely to accrue because of not only KM activities implemented in an organization but also the types of idiosyncratic knowledge assets in the organization's reach (Kianto *et al.*, 2014). Hence, to better understand how KM impacts performance, knowledge as the object of management should be better included in the theoretical models.

According to our results, providing an improved understanding of the impact of KM on business outcomes was seen as a primary issue for advancing the field, both in terms of academic research and practical activities. To support researchers to focus their studies accordingly, a number of more specific research questions/topics were suggested for each theme which are summarized in Table VII.

5. Conclusions

In this paper, we addressed future research topics on the intersection of KM and organizational performance. Our treatment was based on interviews of more than 220 global KM experts representing KM research and practice across 38 countries around the world. Eight specific research themes with more specific further research questions were identified, addressing the relationship of KM and business outcome from a multitude of overlapping perspectives: business strategy, IC, decision-making, knowledge sharing, OL, innovation performance, productivity and competitive advantage.

Our discussion indicated that knowledge sharing and innovation are widely researched areas which would require more focused studies. Established themes like strategy, decision-making, OL, productivity and competitive advantage warrant new attention from a KM perspective. IC approaches are a promising new research strand with the focus on non-financial drivers and their complex interactions influencing organizational outcomes.

Table VII Suggested research themes/questions

<i>Themes</i>	<i>Research questions (examples)</i>
Business strategy	<p>How KM can be used as a business strategy in facilitating financial performance?</p> <p>Differentiating between different KM strategies: Knowledge development (knowledge is the subject of attention), knowledge utilization (routines are subject of attention) and knowledge capitalization (profit is the subject of attention) and their implication for performance</p> <p>Empirical demonstration of specific impacts of KM strategy on organizational strategy and financial performance</p> <p>Identifying KM intermediate variables of business performance that directly leads to financial performance</p>
Intellectual capital	<p>Research on IC approaches to understand the impact of KM on business outcomes</p> <p>Establish the role of knowledge and IC within integrated reporting approaches</p> <p>Understand the impact of KM by uncovering the organizational complexity with IC approaches</p>
Decision-making	<p>Design and test IC indicators for organizational practice</p> <p>KM tools and techniques that can facilitate timely decision-making in an organization</p> <p>KM impact on different levels of organizational decision-making processes</p> <p>Demonstration of KM as a driver of networks for learning through knowledge transfer</p> <p>KM impact on operational efficiency and effectiveness in an organization</p>
Knowledge sharing	<p>Ways to investigate the quality of knowledge being shared</p> <p>Ways to measure the outcomes of knowledge sharing</p> <p>Ways to encourage employees to be involved in knowledge-sharing process</p>
Organizational learning	<p>Ways to create knowledge-sharing culture within the organization</p> <p>Organizational KM framework for implementing learning system for business outcome</p> <p>How KM can act as a mechanism for improving organizational learning</p> <p>What kind of learning tools and technologies could be utilized for KM activities</p> <p>Cost-benefit analysis of institutionalizing KM learning management system in organization</p> <p>How KM and OL impact organizational performance, especially in terms of financial performance</p>
Innovation performance	<p>How managing knowledge can advance innovation as a business outcome</p> <p>Further empirical investigation on the interplay between KM and innovation performance</p> <p>Research on KM and how it contributes to innovation speed</p> <p>How innovation enhances knowledge creation process in organizations using KM, entrepreneurship and innovation models</p>
Productivity	<p>Causal relationship between KM initiatives level of implementation and business outcome</p> <p>Measurable indicators for measuring direct and indirect contributions of KM to business outcome</p> <p>Analyzing the business outcomes of KM from both financial and non-financial perspectives</p> <p>Differentiating contributions of KM toward related terms of productivity, competitive advantage and profitability</p>

The risk aspect in the KM context seems to be an overlooked perspective in KM research which should be more deeply explored.

Despite the unique global coverage of our study, the research also has some limitations which we would like to emphasize. Our sample is dominated by European-based KM

experts and there were only a limited number of critical researchers who made themselves available for this undertaking. The self-selecting sampling approach by relying on the networks of each partner could have biased the structure of our sample. Despite the briefing of each partner by a coordinator regarding the agreed-upon interview protocol, interviews could have been conducted differently depending on the experience and situation in each case. Furthermore, as the interview guide covered a broad range of topics related to KM, the depth and elaborateness of the individual responses might be limited compared to an approach which focused on single thematic topics only.

The implications for practitioners from our study are that there is substantial research evidence available which supports the positive impact of KM on innovation (Darroch, 2005; Andreeva and Kianto, 2011, 2012). Research approaches which recognize these complexities like IC assessments (Andriessen, 2004; Alwert *et al.*, 2004) have demonstrated their value in practice (Mertins *et al.*, 2005); however, their academic evaluation remains to be undertaken. The risks aspect on KM might be a useful joint endeavor of the practitioners applying this perspective in their organizations with accompanying researchers gathering further evidence and providing feedback to practice.

To provide further assistance and impact into organizational practice, researchers should perform more review studies and meta-analysis (Tranfield *et al.*, 2003) of the different studies available in the field and related root-disciplines to consolidate the available body of knowledge: "Today, many discoveries and advance in cumulative knowledge are being made not by those who do primary research studies but by those who use meta-analysis to discover the latent meaning of existing research literatures" (Schmidt, 1992, p. 1,179). This would help practitioners better understand where KM enhances the competitive advantage of organizations and where further joint collaboration with practice is required to fill the gaps in the KM landscape. Furthermore, researchers might be guided by these topics suggested by our global panel of KM experts and future review to embark on new research to advance the KM discipline.

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Appendix 1

<p>Part A: Demographic data</p>											
<p>Part B: Achievements — Challenges — Approach</p> <p>Theory</p> <p>B1. What is the most important recent theoretical advancement in KM? B2. What is the most pressing and challenging theoretical research issue for the understanding and advancement of KM? B3. Which theoretical approach and/or scientist is most likely to deal effectively with this theoretical research issue?</p> <p>Practice</p> <p>B4. What is the most important recent practical advancement in KM? B5. What is the most pressing and challenging practical problem for the understanding and advancement of KM? B6. Which practical approach and/or organization is most likely to deal effectively with this practical problem?</p>											
<p>Part C: Core Concepts: Knowledge and Knowledge Management</p> <p>C1. What is your definition or understanding of the core concept “Knowledge”? C2. Is there a need to undertake research related to the theoretical understanding of “Knowledge”? (Please explain) C3. Is there a need to undertake empirical research related to “Knowledge”? (Please explain) C4. What is your definition or understanding of “Knowledge Management”? C5. Any other observation regarding “KM” which you find important but not reflected in the above questions?</p>											
<p>Part D: Research Needs regarding Knowledge Management Dimensions</p> <p>These dimensions are based on conceptual Frameworks for KM developed in Europe (CWA 14924) and Asia (APO 2009).</p> <p>D1. The relationship between KM and Business Outcomes (e.g. Growth, Productivity, Quality, Profitability, Competitiveness, Image & Reputation). How important research in this area should be in the future?</p> <table border="0"> <tr> <td>Highly important</td> <td>Important</td> <td>Medium</td> <td>Less important</td> <td>Not important</td> </tr> </table> <p>D1a Please explain your assessment. D1b What are the particular important elements (research topics & questions) in this area? D1c Which methodological research approach would be most feasible in this area? D1d What timeline would be appropriate to accomplish the research?</p> <p>D2. The relationship between KM and human & social enablers (e.g. People: Skills, Individual capabilities, team capabilities, Leadership, Incentives)</p> <p>D3. The relationship between KM and technological enablers (e.g. Technological infrastructure, IT Tools, Web2.0, etc.)</p> <p>D4. The relationship between KM processes (e.g. Identify, create, store, share, apply) and organizational processes (e.g. organizational routines, operational routines, working processes)</p> <p>D5. The relationship between KM and organizational capabilities (e.g. innovation, absorptive, dynamic, adaptive)</p> <p>D6. The relationship between KM and company strategy (e.g. Vision, Mission, Strategy process)</p> <p>D7. The relationship between KM and the organizational environment (e.g. market, suppliers, government, legal framework)</p> <p>D8. The relationship between KM and the society and economy (e.g. knowledge economy, economic & social development)</p>	Highly important	Important	Medium	Less important	Not important						
Highly important	Important	Medium	Less important	Not important							
<p>Part E: Education and Teaching for Knowledge Management</p> <p>In this section we like to explore the perception of academics & practitioners regarding the needs for education and teaching of KM.</p> <p>E1- How important do you think is the systematic education of knowledge management?</p> <table border="0"> <tr> <td>Highly important</td> <td>Important</td> <td>Medium</td> <td>Less important</td> <td>Not important</td> </tr> </table> <p>E1a Please could you elaborate briefly and explain for your answer giving some reasons?</p> <p>E2 How do you think the teaching about KM should be provided? KM should be taught ...</p> <table border="0"> <tr> <td>... undergraduate level (Bachelor programme)</td> <td>... not at university, but provided by specialised training provider</td> </tr> <tr> <td>... Master programme</td> <td>... other, (please specify)</td> </tr> <tr> <td>... part of established programs.</td> <td></td> </tr> </table> <p>E3 If you suggested that KM should be part of another programme, please specify briefly. Please let us know the discipline (Humanities and Arts, Social Sciences, Math and Computer Science, Natural Science) and the sub-discipline (e.g. Business and Management, Computer Science, Education, Engineering, Library and Information Science, Psychology, etc.) KM should be part of: ...</p>	Highly important	Important	Medium	Less important	Not important	... undergraduate level (Bachelor programme)	... not at university, but provided by specialised training provider	... Master programme	... other, (please specify)	... part of established programs.	
Highly important	Important	Medium	Less important	Not important							
... undergraduate level (Bachelor programme)	... not at university, but provided by specialised training provider										
... Master programme	... other, (please specify)										
... part of established programs.											
<p>Part F: Comments – Suggestions – Feedback</p> <p>Do you have any final comments, suggestions or would like to give us your feedback regarding this research initiative?</p> <p>F1 Comments</p> <p>F2 Suggestions (Was something important lacking in our questionnaire?)</p> <p>F3 Feedback</p>											

Appendix 2

Table A1 Coding schema for experts

Country (ISO 3166)	Industry	Role	Education/Discipline
AU – Austria	AE – Aerospace Industry	CKO – Chief Knowledge Officer	ARC – Architecture
BA – Bosnia&Herz	AU – Automotive Industry	KPM – Knowledge Program Manager	BM – Business & Management Research, Accounting
BR – Brazil	BIF – Banking, Insurance and Financial Services	HKM – Head of Knowledge Management	CIT – Computer Sciences & Information Technology
CA – Canada	CO – Construction	IKM – Internal KM Consultant	ECO – Economics
CH – Switzerland	CPS – Consulting and Professional Services	EKM – External KM Consultant	ENG – Engineering
CL – Chile	CG – Consumer Goods	DIR – Director, Manager	GEO – Geology
CO – Colombia	CP – Chemical and Pharmaceutical	OB – Other Business role	IS – Information Science, Library Science
DK – Denmark	ITS – IT and Software	PRO – Professor	KM – Knowledge Management
EG – Egypt	ELE – Electric Industry	SL – Senior Lecturer/Lecturer	PHI – Philosophy
ES – Spain			
ET – Ethiopia	ERM – Energy and Raw materials	SR – Senior Researcher	NAT – Natural Sciences, Physics, Chemistry, Biology
FI – Finland	ECM – Engineering, Capital Equipment and Metal	OA = Other role academia	PSY – Psychology, Behavioral Science
FR – France	FA – Food and Agriculture		SOC – Sociology
DE – Germany	GOV – Government Administration		POL – Political Sciences
GB – Great Britain	HE – Higher Education, University		LAW – Law
HK – Hong Kong	MEF – Media & Film		HLA – Humanities, Languages, Art
HR – Croatia	PWC – Paper, Wood, Glass, Ceramics		OD – Other Discipline
HU – Hungary	TEL – Telecommunications		
IE – Ireland	TCF – Textile, Clothing, Shoes, Fashion		
IN – India	TRA – Trading		
IL – Israel	TRT – Transport and Tourism		
JP – Japan	SER – Services		
KE – Kenya	OTI – Other Industry		
LK – Sri Lanka	NA – No answer		
MA – Morocco			
MX – Mexico			
NG – Nigeria			
PL – Poland			
PT – Portugal			
RI – Indonesia			
SE – Sweden			
TH – Thailand			
TT – Trinidad & Tobago			
US – United States			
UY – Uruguay			
ZA – South Africa			

Notes: Example: AU-01-HE-PRO-15-ECO; A coding schema for each interview partner was designed consisting of the following: AU = Austria – Country working in; 01 = Number of interview per country; HE = Higher Education – Industry; PRO = Professor – Role of the interviewee; 15 = years of KM experiences; ECO = Economics – Academic; Discipline doing research/Industry; Discipline educated in

About the authors

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