Future Research in Knowledge Management: Results from the Global Knowledge Research Network Study

Peter Heisig

1 Introduction

Over the last two decades the role of knowledge in organizations has attracted considerable attention from organizational practice and academia (Blackler et al. 1993; Nonaka 1994; Grant 1996; Beamish and Armistead 2001; Jasimuddin 2006). A broad research community has emerged, supported by 25 peer-reviewed journals (Serenko and Bontis 2013a) which has attracted scholars from fields such as management, information management and library sciences, psychology and organizational studies, sociology and computer sciences, engineering, medicine and philosophy (Venzin et al. 1998; Alavi and Leidner 2001; Argote et al. 2003; Gu 2004; Baskerville and Dulipovici 2006; Nonaka et al. 2006; Martin 2008; Wallace et al. 2011; Lee and Chen 2012). The assessment of the knowledge management (KM) field ranges from suggestions that KM is in a state of "pre-science" with different paradigms and disagreement about fundamentals in the field (Hazlett et al. 2005) to others seeing a 'healthy arena with a strong foundation in multiple theories and clear direction for future work' (Baskerville and Dulipovici 2006) or even those who advocate to move on 'beyond KM' (Lehaney et al. 2004; Jordan and Mitterhofer 2010).

In organizational practice, one can hardly find any sector which has not embarked on a project or program to improve the use of knowledge inside the organization. KM projects have been carried out in areas such as aerospace and construction industry, in farming and consumer goods, in medicine and nuclear energy, etc. KM is still among the 25 most popular management tools, but with low satisfaction scores (Rigby and Bilodeau 2011). It was claimed that KM continues to suffer from an image problem arising from its overselling by vendors and consultants in the 1990s (Martin 2008). Nevertheless, a representative study of

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businesses in Germany ($n = 3401$) concluded that knowledge-oriented management has a significant influence on performance (Pawlowsky et al. 2011; Pawlowsky and Schmid 2012).

After more than two decades of KM research which has attracted researchers from a multitude of different academic disciplines, practitioners from a broad range of different industries and different sectors of societies around the globe, the Global Knowledge Research Network (GKRN) decided that it was a timely juncture to review the field and suggest a roadmap for future research in KM. Our study aims to identify advancements and challenges in KM theory and KM practice, and future KM research needs. We used an interview approach to incorporate the views of both, KM researchers and KM practitioners from around the world. A review of the academic literature would have missed the input from practitioners around the world as their share in academic publications decreased from 48.3 % in 1997 to 10.1 % in 2008 (Serenko et al. 2010) and KM research needs to increase its practical relevance too (Booker et al. 2008).

> Global Knowledge Research Network – Vision and Aims: A global network of leading experts whose purpose is to advance the understanding and solving of knowledge related challenges in theory and practice from multi-disciplinary and global perspectives. We aim to provide practical solutions based on profound theoretical understanding and rigorous research.
>
> We aim . . .
> . . . to undertake world-class collaborative research,
> . . . to provide evidence-based advice to address practical challenges,
> . . . to consolidate and advance the theoretical understanding of knowledge management and
> . . . to support the development of communities based on the efficient use of knowledge management and experience. (Heisig and Samuel 2013)

2 Research Method

2.1 Research Instrument

The study adopted an explorative research approach which aimed to elicit the views of KM experts about the main research dimensions. The interview guide was based on previous research (Scholl and Heisig 2003; Scholl et al. 2004) and the core dimensions derived from KM frameworks (Lehaney et al. 2004; Heisig 2009) accepted in Europe (CWA 14924) (CEN 2004) and Asia (APO 2009). The initial network partners reviewed and commented on the proposed instrument. The dimension "knowledge society and knowledge economy" was included which reflected the notion of the knowledge-based development of societies. In April 2012 ethical approval was granted and pilot interviews in Denmark and Germany undertaken. No changes to the instrument were required.

The final interview guide consists of the following sections:

(A) Demographic data (A1–A11)
(B) Achievements, Challenges, Approach in KM Theory (B1–3) and KM Practice (B4–6)
(C) Core Concepts: Knowledge and Knowledge Management (C1–5)
(D) Research needs regarding Knowledge Management Dimensions (D1–D8) (Importance; Rationale; Methods; Timeline)
(E) Education and Teaching for KM (E1–E3)
(F) Comments – Suggestions – Feedback (F1–F3)

The sections B, C, D, E and F contained only open-ended questions while basic demographic variables were chosen for section A. In order to prioritise future research needs, a five-point Likert scale for importance ("How important research in this area should be in the future?") and a three-point time line (Until 2015 – Until 2020 – Until 2025) was given in section D.

The research partners agreed to apply a purposeful sampling approach with the aim for 10 KM experts per country representing equally academic KM research and KM practice. A person should be considered as a KM expert if they have conducted and published research within the KM field on a national or international level or if they have held or hold a management role responsible for KM for a minimum of 5 years. KM experts come from different disciplinary backgrounds representing the diversity of disciplines contributing to KM (Jasimuddin 2006; Maier 2004; Serenko and Bontis 2013b). The KM experts from practice should represent different industry sectors. After the first initial discussions with research partners in May 2011, the research started with the first partners undertaking interviews in April 2012. The last input was received in January 2014.

2.2 Sample

The final sample contains 222 replies from KM experts including interviews with 127 experts with around 6900 min recording time and 95 replies in writing. The average KM experience of the interviewees is 12.3 years (from 1 year up to 63 years who is a records manager). Our sample includes 77 % male and 23 % female experts. The 222 answers represent KM experts from 38 countries and 42 nationalities. The following Tables 1, 2, 3, 4, 5, and 6 provide more descriptive data about the sample.

Table 1 KM experiences in years

<5 years	5–9 years	10–14 years	15–19 years	20–24 years	>25 years
10.4 % (23)	23.5 % (52)	29.7 % (66)	20.8 % (46)	6.3 % (14)	6.8 % (15)

Table 2 Started with KM in year

Before 1995	1995–1999	2000–2004	2005–2009	2010+
15 %	28.8 %	26.9 %	19.2 %	10.1 %

Table 3 Regional distribution of KM experts

Europe	America	Asia	Africa
51 % (114)	24 % (54)	15 % (32)	10 % (21)
Austria, Bosnia & Herzegovina, Croatia, Denmark, Finland, France, Germany, Hungary, Israel, Ireland, Italy, Netherlands, Poland, Portugal, Spain, Sweden, Switzerland, United Kingdom	Brazil, Canada, Chile, Colombia, Mexico, Trinidad & Tobago, Uruguay, USA	Hong Kong, India, Indonesia, Japan, Sri Lanka, Thailand	Egypt, Ethiopia, Kenya, Morocco, Nigeria, South Africa

Table 4 Distribution of KM experts by roles

Practitioners				Academia		
KM role		Director/ manager	Other roles	Professors	Lecturers or researchers	Other role in academia
Internal	External					
24.4 % (54)	6.8 % (15)	13.6 % (30)	10.4 % (23)	30.8 % (68)	10.8 % (24)	6 (2.7 %)

Table 5 Sectorial distribution of KM experts

Business	Academia	Government	International organisations/NGO
50.2 % (111)	45.2 % (100)	3.2 % (7)	1.4 % (3)/ 0.5 % (1)

Consulting & professional services	IT & software	Energy & raw material	Aerospace	Government
16.7 % (37)	9.0 % (20)	5.4 % (12)	3.6 % (8)	3.2 % (7)

Electric	Banking & insurance & finance, chemical & pharmaceutical, engineering & capital goods	Construction	Automotive, consumer goods, food & agriculture, tele-communications, other services, other manufacturing	Media & film and trading
2.3 % (5)	Each 1.8 % (4)	1.4 % (3)	Each 1.4 % (2)	0.5 % (1)

Table 6 Distribution of KM experts by disciplines

32.7 % (72)	16.4 % (36)	9.1 % (20)	7.3 % (16)	6.4 % (14)
Business & management	Engineering	Information sciences	Computer sciences	Knowledge management
Each 3.2 % (7)	Each 2.7 % (6)	Each 1.4 % (3)	Each 0.9 % (2)	Each 0.5 % (1)
Economics, sociology	Philosophy, natural sciences, psychology	Business information systems, law	Architecture, geology, political sciences	Humanities, languages, art

2.3 Data Gathering and Preparation

The interviews were transcribed by each research partner into a Word template provided by the coordinator. The interviews conducted in native languages (e.g. Arabic, German, Hebrew, Japanese, Portuguese, Spanish) were translated into English language and transcribed by the interviewer. All written responses were in English. All interview transcripts and written responses were forwarded to the coordinator and imported in Nvivo9. The first coding mapped the sections and sub-sections of the interview guide (Fig. 1).

2.4 First Data Analysis

The coordinator extracted the answers for each section (B to E) and forwarded them to 11 teams of researchers from different countries and continents who independently conducted the first data analysis. The partners were asked to read the interview data in order to identify topics and themes emerging from the material and suggest categories (King 1998; Strauss and Corbin 1998). No a priori defined topics were given to the partners. The workshop revealed that the partners suggested themes based on the frequency of appearances in the interview data as

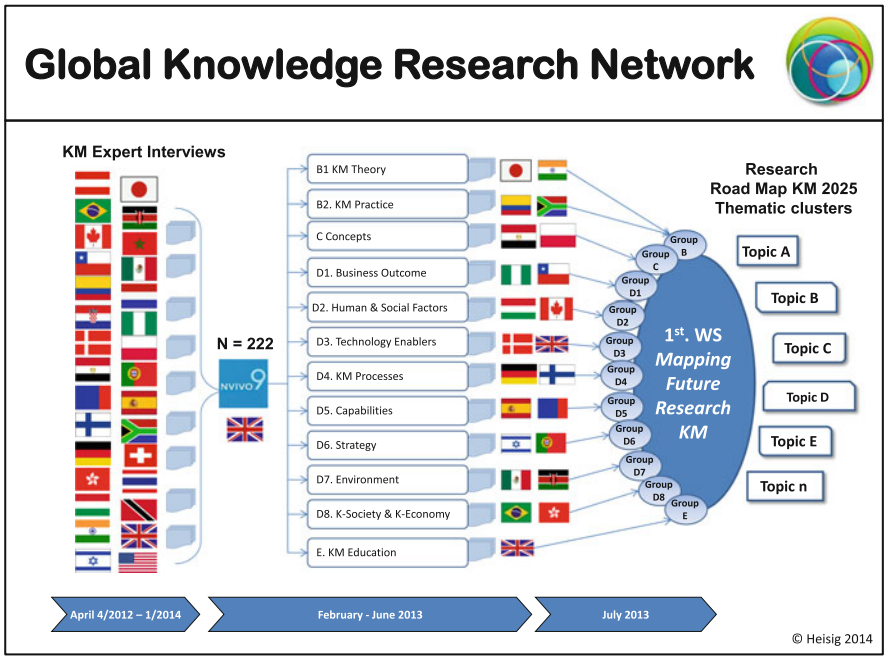

Fig. 1 Overview of research road mapping process

the first step. Further thematic analysis with categories derived from the literature will be conducted at the next stage.

The first GKR Network workshop was attended by 22 researchers from 20 countries from 17 to 19 July 2013 in Leeds. First research pairs familiarised themselves with their independent analysis, discussed the topics each partner identified and agreed on a joint set of main topics (B to D8). After the presentation of the results and the discussion with the workshop participants, core topics were extracted and written on post-it notes for each section. In a final session all members went through all post-it notes and clustered similar and related topics in one theme. Finally a label was suggested and agreed for each thematic cluster. A total of 11 clusters were identified.

In the following sections we report the quantitative findings, illustrated with first results from the content analysis of the interview data. Experts quotes are coded starting with country code ISO 3166: AT = Austria, GB = Great Britain. All academic replies have as the third letter block 'HE' for Higher Education, e.g.: GB-01-HE-PRO-12-BM (see Annex). The researchers who contributed to the first analysis are listed in the acknowledgement section. The author likes to thank all partners and assumes the sole responsibility for the following interpretation.

3 KM Theory and KM Practice: Advancements: Challenges: Approaches

Recent advancements in organizational KM practice (97 %) and KM Theory (87 %) were reported by a very broad majority of experts answering these questions with no differences between the academic (96 %/86 %) and practitioners (98 %/88 %) communities (Table 7).[1]

Despite this agreement in terms of advancements, the analysis of the interview data shows a very heterogenic picture and no clear consensus about these advancements. The only theme which stands out from the multitude of different issues mentioned in both questions regarding KM Theory (B1) and KM Practice (B4) is '*social networking/social media*' (B1: about 10 %; B4: about 16 %).

In regards of the challenges facing KM theory, one common theme emerging from the interview data is the *'link between KM and organisational outcomes, such as performance and value-creation'*. This need is supported by the quantitative data regarding the importance of future research needs. Two thirds (66 %) of all experts

[1] The first analysis for KM Theory was undertaken by Remy Magnier-Watanabe (University of Tsukuba, Tokyo, Japan) and Narendra M Agrawal (Indian Institute of Management Bangalore, India) and for KM Practice by Aldu Cornelissen (University of Stellenbosch, South Africa) and Ernesto Amaru Galvis Lista (Universidad Nacional de Colombia, Bogotá, Colombia).

Table 7 Percentage of experts suggesting advancements in KM theory and KM practice

B1. What is the most important recent theoretical advancement in KM?						
B4. What is the most important recent practical advancement in KM?						
Advancement	**All experts**		**Academia**		**Practice**	
in ...	Yes	No	Yes	No	Yes	No
B1. KM theory (n = 151)	87 % (131)	13 % (20)	86 % (73)	14 % (12)	88 % (58)	12 % (8)
B4. KM practice (n = 177)	97 % (172)	3 % (5)	96 % (76)	4 % (3)	98 % (96)	2 % (2)

(academia: 72 %; practice: 65 %) assessed research around this theme as *'highly important'*.

The lack of agreement among experts regarding the advances might be due to the suggestions made to the question 'which theoretical approach and/or scientist is most likely to deal effectively with this theoretical research issue'. About 20 % of the experts suggest an *'interdisciplinary approach (integrating several disciplines such as artificial intelligence, economics, sociology, anthropology, culture studies, OB, ...)'*. (MA-01-HE-PRO-12-BM) Similar, *"(...) that a much more inclusive, expansive, multi-dimensional perspective on what knowledge management involves needs to be used."* (CA-08-CPS-DIR-13-BM)

Our result confirms the conclusions from a Delphi study conducted in 2001/2002 about the future of KM that "the most promising theoretical approaches are interdisciplinary and multi-disciplinary approaches, combinations of respective methods and techniques (...) and empirical research designs (...). That means, that scientific work from a purely disciplinary perspective falls short of the real problem and much more interdisciplinary and empirical work is needed on KM than until now. KM approaches have to integrate different perspectives in order to provide useful help for the organizational practice" (Scholl et al. 2004), p. 31).

4 Core Concept: Knowledge

Previous research (Scholl et al. 2004) surprisingly concluded that the most mentioned distinction between implicit/tacit and explicit knowledge (Polanyi 1985; Nonaka and Takeuchi 1995; Ambrosini and Bowman 2001; Collins 2001; McAdam et al. 2007; Venkitachalam and Busch 2012) used in KM Frameworks (Heisig 2009) was not seen as a promising theoretical and practical approach. Therefore this study aimed to gather the understandings of knowledge (C1) and elicit requirements regarding the need to undertake research into the theoretical understanding of "Knowledge" (C2) or empirical research (C3).[2]

[2] The first analysis was undertaken by Joanna Paliszkiewicz, Magdalena Madra (Warsaw University of Life Sciences, Poland) and Nasser Fathi Easa (Alexandria University, Egypt).

Table 8 Percentage of experts suggesting research about the concept of knowledge

	All experts		Academia		Practice	
Knowledge	Yes	No	Yes	No	Yes	No
C2. **Theoretical** (n = 177)	67 % (118)	33 % (59)	**80 %** (67)	**20 %** (17)	**55 %** (51)	**45 %** (42)
C3. **Empirical** (n = 164)	87 % (143)	13 % (21)	94 % (74)	6 % (5)	81 % (69)	19 % (16)

The majority of experts (All: 87 %; Academia: 94 %; Practice: 81 %) see a need to undertake empirical research into the concept of knowledge while academics and practitioners differ in regards to the need of more theoretical research (Table 8).

In regards to the underpinning theoretical understanding of 'knowledge' practitioners differ in their assessment of the need for more research. A dominant rationale is that "*I do not believe so. Several authors have spent time studying this subject*" (BR-05-CPS-EKM-14-OD) or *"It has been sufficiently researched"* (IL-09-ITS-CKO-15-NA). Others suggest *"No. I think that that's a pretty well understood concept. I think not only in the academic literature, but in the practitioner world. I think most agree there's two types. There's the stuff that we write down, and the stuff that's in our heads. I think it's actually a very robust model"* (CA-07-HE-PRO-18-KM). Moreover, it is suggested to leave this discussion to philosophers and concentrate on organisational knowledge and its creation: *"I think from a knowledge management perspective we should not get involved in researching what is knowledge. That is more the domain of philosophy or more precisely what we say epistemology, the theories of knowledge. And there are many theories of knowledge. There's not just one single concept of what is knowledge. I think there's far more emphasis should be placed on organisational knowledge. What is organisational knowledge?"* (ZA-02-ITS-DIR-14-KM)

Those in favour to embark in research about the theoretical understanding see currently a misinterpretation of the concept or seek to improve its usability in organisational practice in order:

- To avoid misinterpretation or raise the awareness of the complexity of the subject: *"Yes, absolutely. I mean, from a practitioner point of view, I think we've horrible misinterpreted what knowledge is. We've been captured by the data information, knowledge pyramid. We need a new understanding of knowledge at a practitioner level, but based on really good thinking from an academic side."* (CA-03-CPS-EKM-12-BM)
- To reduce confusion: *"There are any concepts which may confuse practitioners (business people), this is why such research is needed mostly according to difference in understanding what knowledge is."* (PL-03-HE-SL-20-SOC)

- To guide practice: *"Yes, there is a need to undertake research related to the theoretical understanding of 'knowledge' to guide an improved way to apply the concept in the organization."* (BR-08-ITS-CKO-3-BM)
- To increase understanding of the complexity: *"Very much so, because you are going to experience problems in practice if you don't understand how complex a concept knowledge is and you're not going to understand why you are experiencing those problems or those barriers to sharing."* (ZA-06-CG-OB-6-KM)

For research to improve the theoretical understanding of 'knowledge' it is *"not so important to find a consensus, but to open new lines of research as a result of the discovery of specific aspects which may be relevant in today's society"* (ES-04-CPS-EKM-15-BM).

The KM community should exploit views and contributions from other disciplines: *"It would be useful to reconstruct the differences between the different disciplinary views and maybe it converges (. . .)"* (DE-02-ELE-IKM-13-PSY) and *"KM as a managerial applied field might miss a great deal of what is known about knowledge and knowing and cognition in other fields"* (FI-01-HE-PRO-11-KM). The *"integration of many research results is required"* (HU-05-CPS-DIR-14-BM). *"We really need to go to the fundamentals and make alliances with the underlying disciplines of knowledge management. We just need to build more efficient bridges, for example neurologists would be fascinated to see how they can apply their new developments to organizational design and how cognitive researchers could be excited about analysing the kind of processes involve in knowledge markets and so forth"* (MX-01-HE-PRO-23-PSY).

Research needs to address the different aspects such as the dominant dichotomy between explicit and tacit as this academic pointed out: *"And I think there may be ways of doing it better because the relationship between tacit and explicit knowledge is always very problematic and people can't really sort it out."* (GB-08-HE-PRO-30-BM). Furthermore, *"we need to reconsider the connectionist view of knowledge. He is not sure he has knowledge on his own. In a way, knowledge only exists when it is shared"* (JP-01-HE-PRO-20-BM).

Research should also re-visit the data – information – knowledge hierarchy *"I don't think we understand what knowledge is and we still sort of passively define it as a superseded set of data, information, knowledge and then some people add wisdom and then we're all happy with what does it mean. That doesn't help a company understand by say matrix of knowledge (. . .)"* (ZA-08-HE-PRO-15-BM) and investigate its limitations and usefulness for research and practice (Tuomi 1999). This need is supported by the review of knowledge in KM Frameworks. About a quarter of frameworks even did not explicitly define knowledge while the remaining 129 frameworks mention a total 29 different knowledge dichotomies (Heisig 2009; Heisig and Orth 2007). Previous studies arrived to similar

conclusions (Hazlett et al. 2005; Grossman 2007), which underlines the urgency to open up this line of inquiry.

5 KM Dimensions

Complementary to the open questions in the previous sections B and C, we aimed to elicit the assessments and views from the KM experts regarding core dimensions derived from KM frameworks agreed in Europe (CEN 2004) and Asia (APO 2009) in section D.[3]

About 7 out of 10 KM experts rated the need for future research regarding the **Business Outcome** (D1) of KM as '*highly important*', equally rated is the need for an improved understanding of the **Human and Social factors** (D2) in KM (65 %), followed by research into **Organisational Capabilities** (D5: 57 %). About half of the respondents see it as '*highly important*' to undertake research about **Strategy** (D6: 46 %) and **KM Processes** (D4: 42 %). Finally, a third (all 34 %) regard research into **Technology enablers** (D3: 34 %), **Organisational Environment** (D7) and the **Knowledge Economy & Knowledge Society** (D8) as highly important. While academics and practitioners agree on most of the dimensions, we can observe a larger difference of 11 % regarding the importance of research in **Human and Social factors** (D2) (Table 9).

In the following sections, we will provide a brief overview of the main rationale and topics which emerged from the input of the KM experts.

5.1 Business Outcome: D1

Most experts (68 %) agreed that providing evidence for a positive influence of KM onto business outcome is highly important.[4] The main rationale was that without such evidence, KM would not get support from management:

> *"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; *"At the end of the day, that's what it's all about. If KM does not link to business outcomes, then the whole thing is useless."* CA-07-HE-PRO-18-KM; *"A company's bottom line remains, and will remain, the #1 driver a method or approach that does not deliver to the bottom line does not have a future."* TH-02-CPS-IKM-3-KM

Experts are also aware that it is a huge challenge to demonstrate the positive influence of KM which is even more challenging if the researcher adopts a view of knowledge interwoven into practice (Gherardi 2006) as this expert states: *"The*

[3] The statistical analysis was undertaken by Peter Heisig (Leeds University Business School, UK).

[4] The first analysis was undertaken by Olunifesi Adekunle Suraj (Lagos State University, Nigeria) and Gregorio Perez Arrau (Universidad de Santiago de Chile, Chile).

Table 9 Importance of future research in eight dimensions

KM Dimension	Respondents 'highly important' (n = 221)		
	Total (%)	Academia (%)	Practitioners (%)
Business outcome – D1	68	72	65
Human and social factors – D2	65	71	60
Organisational capabilities – D5	57	60	54
Strategy – D6	46	46	46
KM processes – D4	42	42	41
Technology enablers – D3	34	34	34
Organisational environment – D7	34	32	35
Knowledge economy & K. society – D8	34	37	32

point is this, of course that relationship is undeniably important, (...) But you can now see that the moment you move to a view that says that, no but, knowledge is interwoven into practice and these things, then your problem is, that can't demonstrated like that, because it's mediated through so many things that you can't demonstrate one-to-one...it's not an unproblematic thing to do, and if you want to do a study like that, that does that, then people would say, you didn't improve anything here" ZA-03-HE-SL-13-PHI.

But KM is not the only management approach which faces difficulties to demonstrate its value contribution as one expert reminds *"(...) there is no clear formula on the relations between KM effort and organizational values or perceived capabilities. Just like Marketing or CSR functions to an organization, important but no clear indication of the relationship between efforts and value returns."* (TH-05-ERM-KPM-5-BM)

Practitioners suggest that the outcome should be inclusive and go beyond financial return-on-investment approaches; academia recommends multidimensional approaches recognising the complex reality and longitudinal studies to identify causal relationships, although case studies are the most mentioned (30 %) research approach: "*How to measure the impact of KM on business outcomes? The answer to this question must be developed from a perspective wider than only the economic value of knowledge management."* CO-06-CON-HKM-4-ENG; *"Multidimensional approaches or models such as the "Balanced Scorecard" allow a better understanding of the complex and multidimensional reality of knowledge processes in the organization. Along these lines, it is important 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; *"Now we need longitudinal analysis to identify causal relationships as we currently only have correlations. Sure we did regression analysis as well as structural equations which map the plausibility of the model. But what is now really to be done with longitudinal studies if causal relations exist between these factors"* DE-06-HE-PRO-23-BM. A first step towards evidence about the positive

influence of knowledge-related management on performance has been recently shown by a representative survey of businesses ($n = 2933$) in Germany (Pawlowsky and Schmid 2012). A more detailed discussion see also (Perez Arrau et al., 2014).

In summary, KM needs to demonstrate its positive influence on business outcomes in order to gain relevance in practice and academia. While both recognise the challenge of such an endeavour, both agree that the outcome needs a broader understanding (e.g. IC, maturity models) than in financial terms only. Case studies, multidimensional and longitudinal research approaches are suggested.

5.2 Human and Social Factors: D2

Human and social factors such as e.g. people, skills, individual capabilities, team capabilities, leadership, incentives, etc., have been assessed by 65 % as an equally 'highly important' future KM research area to business outcome.[5] The dominant rationale is that KM is about people or people are at the centre of KM. This rationale is derived from an understanding of *'knowledge residing in people's minds'*, *'people own initial knowledge'*, *'people are the source of new knowledge'*.

Emerging is the understanding that *'knowledge exists in the social realm'* (CA-05-CPS-DIR-13-IS) or *"It's highly important, because originally the belief that the intellectual capital sits between the ears, but now we not only know that it is between the ears but also between the people. The formation of intellectual capital results strongly from interactive relations to be explained and understood and therefore such relational and interactive processes are highly important in regard to the generation of new knowledge and the use of existing knowledge."* (DE-06-HE-PRO-23-BM).

In terms of topics mentioned, we could hardly identify any surprising new themes. Interviewees mentioned as particular important research topics the classical themes such as the influence of culture, trust building, barriers and motivation, incentives for knowledge sharing, recognition, leadership characteristics for KM, social relations among teams, skills and human behaviour for KM, learning, creativity, collaboration and communication, team capabilities, role, skill profile of knowledge manager, etc.

A practitioner believes that KM practice could profit from KM research which integrates the findings from basic research in relate disciplines: *"Beside the research this is highly important. But I think that there is already a lot of research out there in sociology, psychology down to neurobiology. I think that to bring this*

[5] The first analysis was undertaken by Nóra Obermayer-Kovács (University of Pannonia, Hungary) and Anthony Wensley, Max Evans (University of Toronto, Canada).

together and integrate if for knowledge management or the design of knowledge management. It's highly important seen as the integration of the results from different disciplines." (DE-07-AU-HKM-11-ENG)

Personal skills for KM (Heisig and Finke 2003; Reinmann and Eppler 2008) were rarely mentioned by the experts: *"(. . .) what competences do employees need to have to be able to manage knowledge in the organisation. Which personal competences does a person need for his own knowledge and which competences for the organisation"* (DE-08-HE-PRO-17-BM). Similarly, "*so these are the basic competencies of capturing, storing, sharing and applying knowledge. I think every individual that's a knowledge worker needs to be competent, in other words that they know the best methods, the best tools and the best techniques to do that."* (GB-04-CPS-DIR-19-CIT)

One aspect which was only mentioned by a single expert is the dimension of power in KM in relation to legitimacy and how power affects what counts as knowledge: "*People have debates, disagreements, and it's about knowledge claims where if I'm arguing with you, I'm basically going to try and discredit your knowledge, you know, and try and legitimise my knowledge. And that's ultimately about power"* (GB-07-HE-SL-13-SOC).

Furthermore research into the potential negative effects in KM is nearly absent in our dataset, with the exception of the notion of information overload by new technologies for KM (e.g. mobile technologies) and negative effects of social media onto social relationships between people. This supports results from previous research claiming a dominance of an optimistic view on KM (Schultze and Leidner 2002).

Another dimension addressed is the influence of new technologies such as social media in regards to knowledge sharing among the younger generation (Generation Y) and with a sceptical view: *"(. . .) I'm getting worried when I look at children using BBM's and Facebook statuses and Twitter feeds and. . .it's all one-liner sentences. I'm not sure if we are breeding a generation where they don't have the ability to read 20 or 30 pages and can summarise it in half a page or one page, because they are used to hear things briefly and cryptically and respond cryptically. I don't think we are going to advance knowledge if we don't improve that skills level in terms both writing and interpreting."* (ZA-02-ITS-DIR-14-KM)

In regards to methodological research designs, the experts articulate a trend towards qualitative research approaches including observational studies, in-depth case studies, action research, but also experimental research designs.

In summary, an optimistic view of KM still dominates, the interviewees do not articulate any novel themes, and KM could profit from systematic review of research results (Tranfield et al. 2003; Denyer et al. 2008) in basic disciplines such as psychology, sociology, organisational behaviour in order to derive research propositions to be tested in further empirical research. Surprisingly, the aspect of power in KM was only mentioned by one single interviewee. Beside addressing the power dimension in regards to knowledge and KM, critical research should focus on the social consequences of KM at the individual, organisational and society level.

5.3 Technology Enablers: D3

The technology enablers received the lowest rating with only a third (34 %) of practitioners and academics claiming this field as highly important.[6] Innovation in this area happens mainly in practice outside academia in tech firms as academic research cycles are outpaced by innovation in technologies.

The role of academia is seen in improving the understanding about the limits of technology in KM, supporting making the 'right' choice from the multitude of technological options available, helping to implement and operate these applications in organisational practice, and finding the 'right' balance between technology and the human dimensions of KM.

In terms of research topics, research questions related to social media and social software stand out. How to make best use of social media tools in organisational settings; investigating the connectedness between employees but also between businesses and customers; what is the value provided by social media; does social media shape the organisational culture; how to protect knowledge captured by open social software and finally the area of personal usage of the 'right' mix of applications. These observation complement a research agenda recently suggested by (Von Krogh 2012).

Further themes which emerged were labelled as '*consumerisation*' of knowledge, where capturing and sharing knowledge becomes much easier with the new technologies, but how it could be further optimised remains a research challenge. Another common theme emphasises the role of human factors in terms of behaviour, culture and generational changes. Finally, the redesign of work should be addressed from four main angles, such as the globalisation of the workforce, the increase in mobility and use of mobile technologies for KM, the use of collective intelligence and the increasing interconnectedness of devices. A more detailed discussion see also (Sarka et al., 2014).

[6] The first analysis was undertaken by Nicholas Caldwell (Suffolk Business School, UK) and Peter Bo Sarka (Technical University of Denmark, Denmark).

In summary, research in technological enablers should also manly focus on the human side of the application of the new technological tools, its implementation and the consequences of its use and misuse with its current focus on social media and the up-coming technologies under the label of 'big data'.

5.4 KM Processes: D4

Research regarding the relationship between KM processes (e.g. identify, create, store, share, apply) and organizational processes (e.g. organizational routines, operational routines, working processes) was rated by 42 % of the experts as highly important.[7]

A first review of the data showed that experts do not agree on the meaning and function of the KM processes, which are a core element of the majority of KM Frameworks (Heisig 2009). Are these processes analytical categories or real organisational processes? Some experts see them as "*the core issue in organizational KM"* (DE-15-HE-PRO-22-POL) or *"Because this is the core of KM"* (IL-07-HE-SL-17-BM). KM processes are regarded as closely linked to organisational processes "*in my opinion, a KM process is an organizational process"* (DE-08-HE-PRO-17-BM), or *"two sides of the same coin"* (PT-07-HE-PRO-10-ECO) which *"(. . .) must occupy a "natural" space together with other processes considered as an integral part of what must be done"* (ES-04-CPS-EKM-15-BM). Experts regard them as the crucial link where the added value from knowledge is created for the business *"Knowledge has no value if it is not identified and applied in productive processes. This is the key question of KM!"* (FI-03-CPS-NA-32-ENG) and *"(. . .) where the rubber meets the road."* (DE-06-HE-PRO-23-BM). Critics see them as *"(. . .) artificial constructs these knowledge processes. These are the tools of the academic. In the business context they are rather problematic. There we want that people think more about knowledge in the business processes or routines."* (DE-02-ELE-IKM-13-PSY) or even reject this concepts as *"(. . .) an old definition"* (GB-10-ERM-HKM-7-NAT) or the *"Wrong model! Focuses on codification and structure. And the granularity's all wrong. Again what you really want is to look at ecological and biological models and see how we can augment or complement it"* (GB-18-CPS-DIR-20-PHI). Therefore research should clarify the conceptual status and the relationship between these concepts used in KM, management research and organisational studies.

The integration of KM into organizational processes (business processes, working processes, routines, etc.) is the main topic which emerged from our data, confirming previous research (Scholl et al. 2004): *"It is important to integrate KM with other processes to obtain results, as well as to apply KM concepts in the*

[7] The first analysis was undertaken by Peter Heisig (Leeds University Business School, UK) and Aino Kianto (Lappeenranta University of Technology, Finland).

daily routine of organizations" (BR-08-ITS-CKO-3-BM); *"KM is still not an essential part of business processes"* (HU-04-ITS-DIR-6-BM); *"How to integrate KM into everyday organizational processes?"* (HK-06-NGO-KPM-5-KM).

Another related main theme should focus on the function of KM processes to enhance organizational processes and (business) outcomes: *"(. . .) there is need to know how knowledge embedded in organisational routines and processes can contribute to organisational productivity."* (NG-02-MEF-OB-15-BM) *"The key to understand the impact of KM on performance is to look first at possible effects on operations, processes, and capabilities"* (MA-01-HE-PRO-12-BM).

Further research should address KM processes and organizational design, the relations between the single KM processes or KM activities as well as the relation between routine and non-routine processes. Minor topics are complexity approach, decision making, organizational learning, practices and knowledge governance.

In summary, KM research needs to clarify and verify the role of KM processes, and provide answers to questions about their relationship to process concepts and approaches. Design research in KM could provide design propositions to practice about how to integrate these processes into organisational processes or working processes.

5.5 Capabilities: D5

Research related to KM and organizational capabilities such as innovation, absorptive capabilities, dynamic capabilities, adaptive capabilities was assessed by 57 % of experts as 'highly important'.[8] For one expert, this is the future of KM *"That's from my perspective the most important issue among all. Exactly the prompts you have mentioned here such as innovation, absorptive capacity, dynamic capabilities,* etc. *Here knowledge management has found a completely new meaning. This is from my point of view the future of KM."* (DE-04-HE-PRO-15-BM) *"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). *"Because that would give KM yet again a reason to be, because it is a positive contribution that KM can make, (. . .)"* (ZA-06-CG-OB-6-KM).

Others regard KM as a capability on its own *"Knowledge management is an organizational capability. Therefore, the problem lies in enabling that capability in organizations. Here the human factor is also crucial."* (CO-06-CON-HKM-4-ENG) or the core of doing KM: *"(. . .) Because, in fact, as I was just saying, really, for advanced industrialized countries, the remainder of what's left, is, in fact, your*

[8] The first analysis was undertaken by Karina Jensen (NEOMA Business School, Reims Campus, France) and Nekane Aramburu, Josune Sáenz (Deusto Business School, Universidad de Deusto, Spain).

ability to be innovative, to be dynamically adaptive in a world where you have increased competition, power shifting from the west to the east, great uncertainty. So, in fact, I actually wouldn't draw a distinction between KM and those organizational capabilities. I actually think that is the core of doing KM" (CA-03-CPS-EKM-12-BM). This argument is based on the understanding that "*Knowledge is the foundation for developing individual and organizational capabilities"* (ES-01-ITS-DIR-14-CTI) and *"knowledge is the material exactly for these things (innovation and renewal capability). Innovation is the product of knowledge."* (FI-03-CPS-NA-32-ENG)

Experts further make the link between knowledge, capabilities and company success while reasoning about future research *"Capabilities are the foundation of company success. Therefore, understanding the role of knowledge management in terms of its contribution to capability development is especially relevant"* (ES-08-HE-PRO-9-BM). *"Organisation that is market active and wants to be innovative, dynamic and adaptive should be able to answer on the market request very fast. That is not possible without efficient KM. Adaptive and flexible internal structuring of organisation is still problematic today"* (HR-06-ITS-DIR-3-IS).

Many experts see KM closely related to innovation: *"KM should be seen as strategy to foster innovation"* (BR-04-GOV-OB-14-OD) including *"(...) the linkages between knowledge-creativity-innovation"* (IN-03-HE-PRO-10-BM), *"(...) innovation is very strictly connected to knowledge somehow and learning processes"* (DK-01-CPS-EKM-18-POL) and *"KM helps drive innovation in the organisation"* (NG-05-ITS-DIR-10-IS). Research should address questions such as "*How to create an innovation culture? How to link creativity (creative process) with new knowledge creation and innovation? How to link creativity with knowledge, innovation and organizational strategy?"* (BR-05-CPS-EKM-14-OD) and "*What is the role of creativity in both Knowledge Management and innovation?"* (CA-02-CPS-EKM-12-IS)

In summary, experts suggest to emphasise research into KM as an organisational capability, which has been previously mainly addressed from an IT systems and organisational learning perspective. A second major research area identified is the relationship between KM and innovation including the role of creativity.

5.6 Strategy: D6

Nearly half (46 %) of the experts rated research into company strategy (e.g. vision, mission, strategy process) related to KM as 'highly important'.[9]

[9] The first analysis was undertaken by Rony Dayan (Israel Institute of Technology, Israel) and Florinda Matos, Isabel Miguel (Intellectual Capital Accreditation Association, Portugal).

Future research should improve the understanding of the interplay between KM (strategy) and company strategy to clarify the *"relationship between KM and organizational strategy"* (HU-05-CPS-DIR-14-BM), *"How do organisations employ KM strategy in achieving the organisation's mission and vision?" "What is the role of KM in organisational strategy?"* (NG-03-REM-OB-12-ENG) and *"How KM is placed in a business's strategy?"* (HK-07-ELE-IKM-1-ENG).

Experts claim that the *"Corporate strategy and KM must be integrated, and KM oriented practice and organization must be designed and implemented."* (JP-03-ITS-DIR-18-ENG) or *"Alignment of knowledge management strategy with the company strategy"* (KE-04-HE-PRO-9-IS) (BA-01-HE-PRO-12-BM) should be achieved.

In this context, KM research should address instrumental questions such as *"How can knowledge management interventions support organisational strategy and what is the role of KM initiatives in supporting organisational strategy?"* (ZA-06-CG-OB-6-KM); *"How instrumental is KM in the formulation of organisational strategy?"* (PL-04-HE-SR-4-BM); *"How to link KM strategy to company strategy"* (HK-06-NGO-KPM-5-KM); *"How to build a KM strategy that fits with business strategy"* (MA-01-HE-PRO-12-BM); *"(. . .) identify success" factors (vision and mission types) that enable KM approaches to efficiently support strategy realization* (TH-06-CP-KPM-1-KM). *"How do you articulate the role of knowledge management in the company strategy, in achieving that vision, in executing the mission."* (GB-17-SER-IKM-11-CIT).

Questions about fit and the link to performance and measurement approaches should be researched: *"(. . .) To explore the fit between business strategy and KM strategy and to further investigate whether a good fit correlates with a good performance."* (DE-16-HE-PRO-13-BIS); *"Another important issue is to develop a standardized KM maturity model which will enable managers to measure the maturity of KM concept implementation and to decide upon future KM activities."* (HR-01-HE-PRO-12-ECO)

Several experts suggested research into the strategy process and the role of knowledge and KM within this process *"(. . .) knowledge management as an enabler of the strategy process."* (ES-07-HE-SL-12-BM). In this context the business intelligence is seen as a research area to gather external knowledge to inform strategy: *"I think one topic that people are completely missing is competitive intelligence. We are too much inward looking and too much of our organisational knowledge resources are inward based."* (ZA-02-ITS-DIR-14-KM). Furthermore, the involvement of staff in the development of strategy is hardly researched: *"(. . .) but just one or two glimpses of organisations starting to use the knowledge of the entire organisation to help inform strategy, as well as the other side of the coin, which is making sure that internal knowledge management efforts are fully aligned with the existing strategy."* (GB-01-CPS-EKM-20-GEO) or *"(. . .) crowdsourcing of strategy."* (ES-04-CPS-EKM-15-BM). Research could address how the new technologies (Web2.0) could be used to implement strategic management as *"(. . .) a distributed process. To determine where are dangers lurking; you can't achieve this with a central supervision department. (. . .) This was his hypothesis.*

This can't be organised in a central manner. From his point of view it is a distributed process which could be organised very well. It will be compacted upwards or sugarcoated so that you cannot criticise the decision makers. And today we have the communication technologies to organise it. If it is done, it's a different question" (DE-02-ELE-IKM-13-PSY).

In summary, research should further clarify the relationship between organisational strategy and KM strategy including instrumental questions about how to achieve the alignment between both strategies. A second major research strand should focus on the process of strategy development and implementation. Here questions on how new technologies (Web2.0) or direct participation could help to broaden the knowledge base by incorporating a broader range of different stakeholders.

5.7 Organisational Environment: D7

Research in the area of KM and the organisational environment (e.g. market, suppliers, government, and legal framework) was regarded by a third (34 %) of the experts as 'highly important'.[10] There is seen a *"lack of research on the impact of context (*e.g. *organisational environment) on KM"* (BA-01-HE-PRO-12-BM).

Rationales mentioned by experts are that *"KM implementation should consider not only the organization itself but its environment because all knowledge is built in a social and collective way"* (BR-04-GOV-OB-14-OD). *"The relationship between organizations and their environment is knowledge intensive"* (MX-03-HE-PRO-15-BM) in that companies not only exchange goods and services but also customer needs, requirements, customer experiences as well as new ideas as *"creativity comes from outside the organisation"* (AU-01-HE-PRO-17-BIS). Organisations are regarded as 'open systems' and changes in the environment have an impact on the organisation: *"I think it's very important, because organisations are open systems and we are living in a very fast changing environment. So it is extremely important to know what's going on in the external environment and sharing that through your organisation"* (ZA-06-CG-OB-6-KM). Companies which *"become insular and insulated from the outside"* (CA-03-CPS-EKM-12-BM) could get into problems *"also, if the environment is not recognized, organizations are condemned to disappear"* (CO-01-HE-PRO-9-BM). The role of KM is seen as bridging the organisation's boundaries: *"KM is a continuum that includes all performance areas and partners–learning crosses boundaries internally and externally"* (US-02-CPS-EKM-15-KM).

The knowledge exchange along the supply chain is one important research area: *"For companies like us, which relies on a vast network of commercial partners to*

[10] The first analysis was undertaken by Lucia Rodriguez Aceves (Tecnológico de Monterrey, Mexico) and Cosmas Kemboi (KCA University, Nairobi, Kenya).

ensure to sell the products, this issue is highly important, because we are obligated to perform knowledge management to ensure that our knowledge is transferred to our partners. Similarly, occurs with suppliers, with whom we must establish knowledge management processes to take advantage of the knowledge about raw materials and how to take advantage of the best way. If our partners grow, we grow." (CO-06-CON-HKM-4-ENG). The supply chain analogy should be extended towards networks and other stakeholders such as governmental bodies. New technologies and services based on the *"(. . .) cloud principle and aimed to build expertise on regulations to provide it to businesses"* (DE-06-HE-PRO-23-BM) could provide insights in knowledge sharing and adoption beyond the classical supply chain paradigm.

It was suggested to use complex adaptive system approaches for future research: *"KM or knowledge governance approach should be based on systems theory and on the vision of the organization as a complex adaptive system, in which the strategy acts as a facilitator to strike a balance with the environment"* (ES-06-HE-PRO-16-ECO). This perspective leads to organisational networks: *"The ecosystem is important, the wider "knowledge ecosystems" or "value networks is interesting"* (FI-01-HE-PRO-11-KM) or *"knowledge ecology"* (JP-06-HE-PRO-33-BM). Some see that *"(. . .) KM blurs the organisation's boundaries. We need to research how KM enlarges the organisation's boundaries"* (IL-07-HE-SL-17-BM).

The potential boundary-blurring effect of KM links into research on open innovation and the role of knowledge in these innovation approaches: *"I think it's highly important. This goes with the whole theme of open innovation. That is where we want to start sharing knowledge outside of the organisational boundaries. The whole theme and way of thinking on how companies operate is to collaborate nowadays, and that is why knowledge management should follow that way of thinking as well. How do we do it outside of the boundaries?"* (ZA-09-HE-PRO-8-ENG)

A different research theme which should receive increased attention focuses on the public sphere under the concepts of 'knowledge cities' and the 'creative industries': *"I think that the intersection between KM researchers, who are looking at the knowledge cities and the knowledge innovation zones, and (researchers), who are looking at the creative cities and what makes a city "creative", would be useful and important."* (CA-05-CPS-DIR-13-IS) In particular, this is interesting as one expert claims that *"the socio-cultural context facilitates or inhibits knowledge sharing."* (PT-07-HE-PRO-10-ECO)

Some experts assessed such research as less important and regard these themes as: *"It's less important. Why? Just way too complicated. (. . .). So, I think it's just a very complex topic."* (CA-07-HE-PRO-18-KM) or *"Too complicated and too specific, so I will again say medium to less important. The reason is not that it shouldn't play in there, it will play in there, but that relationship is so complicated, is so networked and is so specific for every company that I think you can't do research on that. You can't generalise anything."* (ZA-08-HE-PRO-15-BM)

In summary, the study shows that KM reaches beyond organisational boundaries and organisations should be conceptualised as open adaptive systems. Future research should use the concept of a knowledge supply chain, which includes also public institutions and external knowledge via open innovation. A third research strand suggested should address KM on a local and regional level for "knowledge cities" or "knowledge clusters".

5.8 Knowledge Society and Knowledge Economy: D9

Research around issues emerging from KM within the knowledge economy or knowledge society received the lowest rating with 34 %.[11] Experts who regard KM an activity on the organisational level only, did not comment on this dimension, while others see *"KM is a child of the emerging knowledge economy AND knowledge society"* (DE-15-HE-PRO-22-POL).

Experts from non-OECD countries suggested investigating knowledge-based development by referring to failures of development efforts based on natural resources (e.g. petroleum) alone as *"development has not been sustainable due to lack of knowledge ground"* (CL-03-ERM-HKM-5-ECO). *"Knowledge management has an important role in countries development. We need to follow good examples like Korea, a country that in the past made huge changes to develop a knowledge-based economy and today is a great example to countries like Colombia"* (CO-06-CON-HKM-4-ENG). *"What challenges bring these new K. Societies and economies and how can they be overcome?"* (TH-04-CPS-DIR-NA-KM). *"What is the role of KM in preserving societal Culture, Tradition and Languages? To what extent do we manage knowledge for the growth of the economy and for the sustainability of the society?"* (NG-04-TEL-IKM-12-NA)

Some experts reflected on the appropriateness of current national education systems to provide the right skill sets and competencies for society: *"(...) So, that kind of command and control culture combined with that analytical deductive standard approach, I think is limiting our ability for our people to be creative and to come up with new integrations across multiple domains to solve complex problems."* (CA-03-CPS-EKM-12-BM) *"We need to research more on the topic around education to achieve a social economy. Social economy, if organisations transform to social business, change communication, motivation, want new competences from their employees, media competences, this is not only done in organisations, but also happens private"* (DE-13-ITS-EKM-17-NAT). *"Another issue is informal learning and lifelong learning. (...) There exist learning passes,* e.g. *in France, that proof social commitment and what you learned from it, what*

[11] The first analysis was undertaken by Fábio Ferreira Batista (Instituto de Pesquisa Econômica Aplicada, Brasilia, Brazil) and Mariza Tsakalerou (The Hong Kong Polytechnic University, Hong Kong).

capabilities you gained" (DE-17-ERM-IKM-15-ENG). *"How can we improve knowledge acquisition as low cost for the masses? How do we make our citizens educated consumers?"* (US-01-GOV-IKM-19-ARC). Finally, *"What are the skills of the knowledge economy?"* (KE-02-HE-SR-3-IS)

Political sciences should get involved to research how governments and policy-makers could stimulate knowledge creation: *"What can policy-makers, whether that's the mayor and council or the governor or the head of a province or the head of a country, what initiatives and things can be initiated through policy to stimulate the knowledge cycle, the creation of good knowledge, better education, the transfer of knowledge between academic institutions and researchers and those that can put this to good use"* (CA-05-CPS-DIR-13-IS). But also how governmental institutions make use of knowledge: *"(. . .) maybe the KM and Politics – How does politics use knowledge? The General Audits Office which controls the government and expenditure, but what's about knowledge. Knowledge auditing of governmental organizations?"* (DE-03-HE-PRO-22-PHI)

In OCED countries like Germany it is about shaping the political agenda where thinking *"is still strongly framed by thinking of a high-tech machinery industries such as automotive, machine tools, chemical industries,* etc. *But the logic of these industries is not necessarily a knowledge-intensive logic. (. . .) in the political sphere this topic is only addressed in combination with technology, in combination with something,"* While *"you can observe it in Finland, several countries in Asia where the knowledge dimension is part of the political agenda. An independent topic intellectual capital as resource of the country is not yet affine with the political culture and political decision making processes"* (DE-06-HE-PRO-23-BM). *"How do measure the intellectual wealth of a knowledge society?"* (NG-02-MEF-OB-15-BM). Therefore, could intellectual capital become a category for accounting the wealth of nations?

Some experts referred to social issues such as the democratization of knowledge and the implications for ownership and the economy: *"(. . .) in today's world more people know more things than ever before in human history, and that has huge implications for society"* (GB-12-HE-PRO-12-BM) addressing questions such as *"Internet – who owns the content of the internet? versus Open Content and Open Source Movement"* (DE-03-HE-PRO-22-PHI). *"The open source economy"* (IL-04-HE-SL-12-BM).

The openness of different (national) cultures and political freedom required for the knowledge society were other aspects that future research should address: *"There's a knowledge society that presupposes a kind of openness. We have many societies today that are still pretty backward and culturally, where people don't have freedom of expression – things that are needed for there to be a thriving free flow of ideas and creativity"* (CA-08-CPS-DIR-13-BM). But also critical elements such as privacy issues: "*Or knowledge use in health care, addressing privacy issues, the transparent patient."* (DE-03-HE-PRO-22-PHI)

In summary, experts regard relevant research about the knowledge-based development and the role of the formal and informal educational sector to provide the "right" skills for the knowledge society. The role and use of knowledge in the political system by governments should be addressed. Social aspects related to open content such as democratisation of knowledge, cultural openness, political freedom and consequences for privacy are valuable research topics. Finally, does the knowledge economy require new measures of wealth such as a national intellectual capital index?

5.9 KM Education: E

Section E addressed the topic of KM education by asking about the importance of KM teaching, the level of teaching (e.g. academic or non-academic courses) and the disciplines where KM should be taught. Nine out of ten experts from academia and practice stated that "systematic instruction to KM" is 'highly important' (53.1 %; 78) and 'important' (37.4 %; 55) while only one single expert claimed that it is 'not important'. KM Teaching should be part of teaching on Master (70 %; 106) and Undergraduate level (47 %; 71). At the current moment (2012–13) KM should be delivered as part of established programs (53 %; 81) at university and less by specialised training providers (20 %; 31). KM is predominately seen as part of Business Management courses but it was suggested by practitioners (GB-19-CP-OB-3-NAT) to teach the basics to students in Natural Sciences, Law and Medicine.

6 Future Research About Knowledge Management

Over the last two decades, the knowledge management discipline has become enriched with a huge wealth of contributions from a multitude of scholars and an extensive accumulation of experiences in organisational practice in nearly all economic sectors and societies around the world. The multidisciplinary character of KM contributes, in our view, to the lack of agreement on the fundamentals with different paradigms in the field and it is not a characteristic of a "pre-science" state of the KM discipline as others have claimed (Hazlett et al. 2005). Still this multidisciplinarity creates another challenge as one expert put it, that *"Knowledge Management has not yet a proper home, (. . .)"* (GB-01-CPS-EKM-20-GEO). Nevertheless, KM is progressing towards becoming a reference discipline (Serenko and Bontis 2013b).

Our research indicates (Fig. 2) that the KM community should re-visit some fundamentals such as the understanding of the concept of knowledge. Research should also clarify and verify the concept of the KM processes which have become

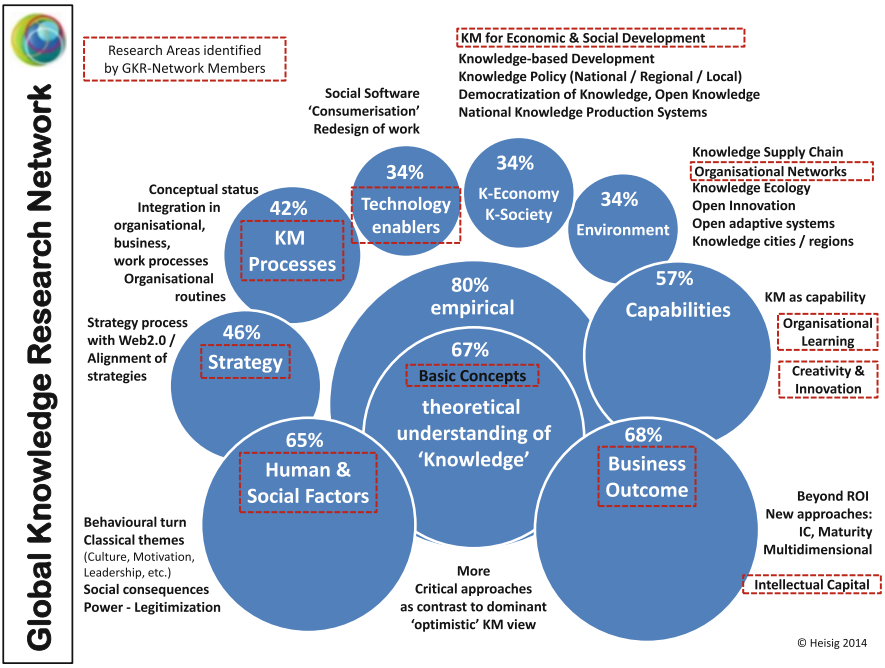

Fig. 2 Importance of future research and selected research themes

a standard element in KM frameworks around the world in academia (Heisig 2009) and practice (CEN 2004; APO 2009). In this context, KM research should also explore ecological and biological models. The question of how to integrate KM into business and organisational processes still awaits a satisfactory answer (Scholl et al. 2004). Another research strand to be emphasised is the conceptualisation of KM as an organisational capability taking advantage of rich research about (adaptive, absorptive, dynamic) capabilities in management and organizational studies. The role of KM in innovation including the relationship with creativity is another important research area derived from the expert views of our sample.

A KM capability approach might also help to address the challenge, shared with other disciplines (e.g. HRM see (Prowse and Prowse 2010), IT: see (Dedrick et al. 2003)), regarding the value contribution of KM. Academics and practitioners agree that such research should understand the added value by KM beyond pure financial indicators, exploring new concepts such as intellectual capital or maturity frameworks. Still, it will be a difficult challenge to identify the value contribution of KM within systemic and dynamic organizational settings. The wealth of practical KM experiences in different economic sectors and in several countries could ease this challenge. KM should employ meta-analysis of existing research and undertake multiple case studies in order to advance the understanding regarding the value contribution of KM.

But how can KM shake off the image problems of the dominant information systems view, caused by its overselling by vendors and consultants in the 1990s

(Martin 2008), if the only consensus among the participants in our study is that a certain technology (today: social software) was regarded as an advancement of the KM field? However, the research suggested in this regard places clear emphasis on the economic, organisational and human context factors related to the implementation and use of these new technologies. This underlines the urgency of the shared view of the KM community to invest in human and social factors research in KM.

Therefore, KM research requires a behavioural turn. Relevant research in the root disciplines of KM such as psychology, behavioural sciences, sociology should be systematically reviewed to develop research propositions for academic studies and design propositions to test in organisational practice (Denyer et al. 2008; Van Aken 2004; Van Aken and Romme 2009). Furthermore, KM research should adopt more critical research perspectives to explore themes such as power, stress and the impact of KM on individuals and social relations. This research could help to balance the still dominant optimistic view of KM (Schultze and Leidner 2002).

Research into strategy should pursue two main strands. The role of KM and the relationship between organisational strategy and KM strategy require further investigation, including instrumental questions about their alignment. Secondly, research should concentrate on the strategy process as such and improve the understanding of the role of knowledge and KM in this process and explore the potentials of the new technologies (e.g. social software, Web2.0) and modes of direct interactions ('knowledge café') to involve a broader range of expertise from internal and external stakeholders.

Organisations are understood as 'open systems' and form part of networks with different partners in supply chains and stakeholders in society. The concept of a *"knowledge supply chain"* (ZA-05-ITS-DIR-32-ENG) has only been applied in the IT outsourcing context (Cha et al. 2008) and further research into the role of knowledge and KM in the supply chain (Samuel et al. 2011) would be a valuable endeavour. The organisational network perspective should also include public agents and undertake research at the local and regional (cluster) level with a focus on *"knowledge cities"* or *"knowledge regions"* as suggested by experts from our sample.

On a macroeconomic and societal level, future research themes should address the role of knowledge for economic and social development, emphasising the knowledge-based development view. The experts in our sample mainly mentioned the education sector and informal training and skill development as sources for building human capital in the knowledge society. But which skills and competences are needed and how and where are they produced remain open questions.

Economists, sociologists and political scientists have used the concept of national production systems or 'national innovation system' (Lundvall et al. 2002) to describe and explain economic development. While tacit knowledge has been recognised in these approaches, the role of KM has hardly been explored in this context. Can a macro perspective of KM employ a concept like a 'national knowledge production system' to describe the knowledge creation and consumption on a national level? And how should we measure the outcome? Could a national intellectual capital index become a category for accounting for the wealth of nations?

Some experts referred to social issues as future research strands, such as the 'democratization of knowledge', proliferation and influence of open source knowledge, different cultural levels of openness and national freedom influencing knowledge sharing and innovation as further research topics.

Finally, the experts rarely mentioned the need for a *"knowledge policy"* (Stehr 2003a, b). But, how could governments and policy-makers stimulate knowledge creation? And should governmental organizations be audited not only in regards of the proper use of public funds, but also regarding the use of the best available (international) knowledge? (Fig. 2).

7 Feedback and Limitations

Many participants from academia and practice welcomed our initiative. Our explorative approach with the data gathering instrument containing broad open questions was criticised by some academic colleagues as "*too broad*" (DE-15-HE-PRO-22-POL). Some participants found the questionnaire too long. The eight KM dimensions (D1–D8) derived from KM frameworks to structure the conversation were regarded as *'not enough theory-driven'* which lead some academics to decline sharing their latest views about the KM field with this research initiative.

Our research approach has its limitations due to the sample of scholars and practitioners the partners were able to involve given the resources and availability. Still we believe that the sample reflects the main academic disciplines of KM research (Serenko and Bontis 2013a, b) and main sectors involved in KM practice. Furthermore, two thirds of our experts have at least 10 years professional experiences in the KM field and therefore would be able to assess the developments from their perspectives.

8 Outlook

This chapter provided a first overview of the results from the Global Knowledge Research Network study about advances, challenges and future research needs around knowledge and KM. However, much more analysis needs to be done to exploit the rich dataset accumulated.

The next step is to undertake further analysis of the qualitative data in order to explore differences among selected segments of experts and topics suggested. Secondly, we will undertake literature reviews for the different topics we addressed in our instrument and contrast the state of the art with our empirical material to derive additional future research questions. Finally, we would like to repeat cyclically this research in the future.

The research strands outlined above are only a few themes, which the members of the Global Knowledge Research Network we able to derive from the data input received from 222 experts from 38 countries. More detailed research will further propose additional themes and questions to be addressed by the large community of KM researchers and KM practitioners.

The input received from around the world shows that KM research has still to address a multitude of interesting themes within interdisciplinary research projects. KM research should take advantage to exploit research results in related disciplines and aim to contribute to the discussions in established research outlets. The close collaboration with KM practitioners should be intensified in order to provide rigours and relevant research for academia and practice (Mohrman et al. 2002; Mohrman and Lawler 2011).

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Annex: Coding Schema for Experts

DE-01-HE-PRO-15-ECO

A coding schema for each interview partner was designed consisting of the following:

DE = Germany – Country working in
01 = Number of interview per country
HE = Higher Education – Industry
PRO = Professor – Role of the interviewee
15 = years of KM experiences (longest if two were given)
ECO = Economics – Academic: Discipline doing research/ Industry: Discipline educated in

Country (ISO 3166)	Industry	Role	Education/discipline
AT – 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	ERM – Energy and Raw materials	SR – Senior Researcher	NAT – Natural Sciences, Physics, Chemistry, Biology

(continued)

Country (ISO 3166)	Industry	Role	Education/discipline
ET – Ethiopia	ECM – Engineering, Capital Equipment and Metal	OA = Other role academia	PSY – Psychology, Behavioural Science
FI – Finland	FA – Food and Agriculture		SOC – Sociology
FR – France	GOV – Government Administration		POL – Political Sciences
DE – Germany	**HE** – Higher Education, University		LAW – Law
GB – Great Britain	MEF – Media & Film		HLA – Humanities, Languages, Art
HK – Hong Kong	PWC – Paper, Wood, Glass, Ceramics		OD – Other Discipline
HR – Croatia	TEL – Telecommunications		
HU – Hungary	TCF – Textile, Clothing, Shoes, Fashion		
IE – Ireland			
IN – India			
IL – Israel	TRA – Trading		
JP – Japan	TRT – Transport and Tourism		
KE – Kenya			
LK – Sri Lanka	SER – Service s		
MA – Morocco	OTI – Other Industry		
MX – Mexico	NA – No answer		
NG – Nigeria			
PL – Poland			
PT – Portugal			
RI – Indonesia			
SE – Sweden			
TH – Thailand			
TT – Trinidad & Tobago			
US – United States			
UY – Uruguay			
ZA – South Africa			

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