Main Research Topics in Knowledge Management: A Content Analysis of ECKM Publications

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Abstract: Knowledge Management (KM) has already reached the level of a scientific discipline and attracts increasing interest in research and practice. As a consequence, the number of KM publications is growing exponentially. The wide spectrum of publications comprises a variety of topics ranging from terminological, conceptual, and technological approaches to managerial implementation approaches. Several attempts have been made to achieve a common ground of the KM discipline. The aim of this study is a CA-based review of a total of 755 publications published in the proceedings of the *European Conference on Knowledge Management* (ECKM) since 2006 and obtained from the *Scopus* Database. To the best of our knowledge, this is the first documented attempt to analyse ECKM contributions using content analysis (CA). We combine the advantages of manually and automated CA in order to detect research areas and activities within ECKM community. Using the statistical software *R*, we applied a manually developed KM dictionary on title, abstract and keywords of the publications to identify key research topics examined over the past years. The results are compared with existing studies. The analysis confirms some results of preceding KM studies and reveals a strong interest of the community in research topics like knowledge processes, innovation, learning and technology. Furthermore, there is an observable tendency to use established research methods for analysis purposes. Since the development of a common ground of the KM discipline is still a challenging task, the findings help to discover emerging research topics in KM research but also mostly preferred research methods. Both thematic shifts in the past and prospective future research priorities are pointed out. The results of this study contribute to the role of KM in building resilience and can be seen as an attempt to reflect the identity and the research interests of the KM discipline.

Keywords: knowledge management, ECKM publications, research topics, research trends, content analysis, dictionaries

1. Introduction

Knowledge Management (KM) has already reached the level of a scientific discipline (Serenko 2013) and attracts increasing interest in research and practice (Dwivedi et al. 2011). As a consequence, the number of KM publications is growing exponentially (Ragab and Arisha 2013). The wide spectrum of publications comprises a variety of topics ranging from knowledge definitions and theories to several technologies and managerial implementation approaches (Timbrell et al. 2005; Kane, Ragsdell and Oppenheim 2006).

Previously, research applied different research methods to achieve a common understanding on the KM discipline. One of these research methods is content analysis (CA). CA is useful to analyse large data volumes, fits well to the handling of context-sensitive information (Krippendorf 2013, Mayring 2013) and can be done both manually and automatically to discover prevailing research topics or trends in the observed analysis unit. Since the development of a common ground of the KM discipline is still a challenging task, research methods like CA can support this goal.

In order to achieve this objective, this study provides a CA-based review of a total of 755 publications published in the proceedings of the *European Conference on Knowledge Management* (ECKM) since 2006. To the best of our knowledge, this is the first documented attempt to analyse ECKM contributions using CA.

The study contributes to research and practice by identifying hot research topics, which characterise the research interests of ECKM community. Both thematic shifts in the past and prospective future research priorities are pointed out. This contributes to stress the role of KM in building resilience and can be seen as an attempt to reflect the identity and the research interests of the KM discipline.

The remainder of the paper is structured as follows: In Section 2 we shed light on different streams of literature, which has already contributed to discover the core of the discipline. Furthermore, we provide an overview of the research objectives (section 2) and the research design applied in this study (section 3). Subsequently, we present the analysis results and a first keyword classification schema based on aggregating the preceding analysis results. We conclude with a summary of the main results, limitations of the study and some directions and implications for further research.

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2. Related work and research objectives

KM literature contains several studies, which reviewed the KM discipline and tried to identify the main research topics by the analysis of a publication sample. A variety of established research methods such as meta analyses, content or documentary analysis, and literature reviews has been applied. The focus of the studies ranges from the analysis of popular research methodologies, most cited authors and hot research topics in KM to the analysis of a mixture of these issues.

For instance, Wallace, Van Fleet and Downs (2011) analysed a corpus of 630 KM articles to find out, which research methods the KM community is mostly dealing with. Nearly three quarters of the articles (455 studies) applied traditional research methods (e.g. questionnaires, surveys, case studies), whereas the remaining 175 articles did not use any of the established research methods. Case studies seem to be most popular with a percentage of 26.8%, followed by questionnaires (16.9 %) and literature reviews (15.4 %). CA was placed on the seventh rank with an overall frequency percentage of 2.6 %. These findings differ marginally from the findings of Dwivedi et al. (2011), who conducted a meta analysis on a summary of 1043 articles published in 358 journals. The authors grouped their results according to categories from which the category of multi-method approaches were ranked on the first place (26.8 %) followed by the category of literature analysis / frameworks and conceptual methods (23.6 %) and case studies (14.8 %). CA can be found on a similar position as in the former study with a percentage of 2%.

Dwivedi et al. (2011) investigated main research issues addressed by KM researchers and their studies. The results showed a strong research interest on KM systems (39.2 %), environment-related topics (22.8 %), and KM processes (17.2 %). Another example for the investigation of KM research topics is the study of Ribière and Walter (2013), who conducted CA on all 235 articles published in *Knowledge Management Research and Practice* Journal between 2003 and 2012. First, the authors used manual CA to extract and derive the top 40 keywords according to their frequency counts. After keyword analysis, automated CA using the tool *Leximancer* was done to identify topic clusters and present them in a concept cloud. The keywords *knowledge sharing* (50 counts), *KM* (41 counts), *case study* (29 counts), *intellectual capital* (23 counts) and *knowledge creation* (22 counts) were on top of the list.

Serenko (2013) finally conducted a meta study on 108 scientometric KM studies. Subject of analysis were focus of the studies, applied scientometric methods, and used databases to identify KM publications and citation impact of papers and authors. With regard to most popular databases, *Thomson Reuters* databases, *ProQuest – ABI/INFORM* and *Google Scholar* shared the first three positions of the ranking. Scientometric research like the studies by Schultze and Leidner (2002), Prusak (2001) and Wiig (1997) were amongst the top most frequent cited works.

We would like to continue the research tradition described previously. The general purpose of the study is contributing to a common view of the main research topics in KM. With a special focus on ECKM publications, our research objectives include the:

- Identification of key research topics and concepts published over the past years.
- Development of a keyword classification scheme starting from the previously identified research topics and concepts.

Based on the analysis of a total of 755 publications published in the proceedings of the ECKM, the following research questions were addressed:

- Which key research topics can be found since 2006?
- How can ECKM keywords and concepts be classified according to specific topics?

3. Research approach

This section provides an overview of our research design and presents data collection process as well as research methods applied in order to answer our research questions.

3.1 Research method

In order to answer the research questions we applied the methodology of automated CA. Krippendorf (2013, p. 24) referred to CA as a *"research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use."* Within social science domain, CA has been already established as a preferable method for text analysis with the aim to systematically analyse different verbalised and recorded content by following a rule- and theory-based approach (Mayring 2010). The main advantages of CA are new insights from the analysed content and an enhanced understanding of concrete phenomena. In addition, it enables the analyses of large data

sets and the processing of context sensitive and informative text and data (Krippendorf 2013). CA can be applied manually (e.g. Bontis 2003, Heisig 2009) and in an automated way by using software solutions (Ribière and Walter 2013) also referred to as text mining software. Both approaches have their advantages and disadvantages, which are already discussed in previous research (e.g. Kruschke 1992; Hampton 1995; Indulska et al. 2012, O'Flaherty and Whalley 2004). Software tools like *ATLAS.ti, GATE, Leximancer* or *R* come up with different statistical packages and text mining functionalities either to support or to accomplish with a minimum of manual intervention most of the data analyses. They are able to handle large data sets (O'Flaherty and Whalley 2004, Mayring 2013). For instance, one can perform data cleaning operations (e.g. stop words removal, punctuation and number removal) or lexical analyses such as frequency counts, co-occurrence analyses or data coding and categorization.

Automated CA in this study was performed by using the software *R*. *R* is a platform independent and open-source programming environment for data analysis and visualization (Venables et al. 2014) which provides different statistical packages for data and text analysis. We decided to use *R* because it provides a large set of functions needed here and because it is possible to program additional functions. Amongst others, *R* includes a text-mining package called *{tm}* that provides the functionality required to perform several transformation and analysis operations on textual data.

3.2 Data collection and preliminary

The CA process started with collecting metadata of 755 publications published in the proceedings of ECKM. Data were obtained from *Scopus* Database and include publications' title, keywords, and abstracts in the time span between 2006 and 2013. Unfortunately, data from years 2014 and 2015 were not available in the databases and therefore has not been considered in the analyses. All metadata were saved in a .csv-file, which is a common file format in *R* to handle the data.

After importing the data into *R*, we separated it into two different corpora. The first corpus contains only the publications' keywords and the second corpus contains the publications' title and abstract. This separation was necessary because of the different metadata formats and their different processing method by the tool. While the keywords of each publication were separated by semicolons, titles and abstracts were available in form of continuous text. Before the analysis, we had to perform some transformations on the corpora for easier data handling. For instance, all data were harmonised to lower case. This was done, because *R* is case sensitive and different spelling forms (e.g. *Incentives* and *incentives*) will lead to inconsistencies in the results. Also, numbers, punctuation and stopwords (e.g. the, you, and, he, is) were removed from the text as they do not add any value or further information to the analysis. After all necessary transformation steps, the process of frequency count analysis started.

From now on, we will consistently use the term "concept" in this paper instead of "term". The decision to use this terminology was made because of the ability to better express that KM research topics can be derived later on from these concepts.

One problem, which occurs in the corpus with continuous text during automated CA, is the occurrence of compound concepts (e.g. *knowledge management* or *knowledge sharing*). For instance, the compound concept *knowledge sharing* will be treated as two single concepts *knowledge* and *sharing.* This reduces the semantical interpretability of performed analysis. One solution discussed in literature (Pollach 2011, Boritz et al. 2013), is the use of predefined dictionaries. The dictionaries come up with a predefined list of terms with relevance to the subject area (e.g. a list of KM related terms when focusing on the KM domain) and allow searching the texts exactly for the occurrence of the predefined concepts in the dictionary. Several studies have investigated the advantages and disadvantages of using either self-developed or existing dictionaries (e.g. Pfaffer et al. 2010).

For the purpose of this study, the authors used a predefined and manually developed KM-dictionary which contains 3847 KM-related concepts. The dictionary was developed by two research assistants based on a manual content analysis on 614 publications taken from the *Journal of Knowledge Management.* Fteimi and Basten (2015) discuss the development process of this dictionary and prove its applicability for KM domain. We match the terms in the predefined dictionary with the keywords listed in ECKM publications. The matching results in 155 additional new concepts and finally led to a list of 4002 KM-related concepts. Subsequently, the dictionary was applied to *ECKM* data material. In summary, 1575 concepts of the overall dictionary concept list were mentioned within ECKM publications. This corresponds nearly to a percentage of 39 %. In addition, our analysis results revealed that 484 concepts occurred with an overall frequency count of one, which corresponds to 31 % of all 1575 occurring concepts. However, after performing the automated analysis, few manual corrections were necessary in order to secure results quality. This comprises the following steps:

- Concepts, which occur in singular as well as in plural forms, were merged to their singular forms and their frequency counts were updated. For instance, the concept *wiki* occurs in eight observations of the dataset (An observation comprises the title, keywords and abstract of one single publication of the overall dataset) in its singular form and in ten observations in its plural form. Four observations contain both the singular and the plural occurrence form of the concept. In order to avoid multiple counts of one concept in a single observation, we perform unique count procedure and considered in such cases only one concept per observation. Consequently, the concept *wiki* occurred with an overall count of 14 times.
- Concepts, which occurred in American and British spelling forms (e.g. *organisational learning* and *organizational learning*), were merged to the British spelling form. Again, frequency counts were updated by considering unique frequency counts.
- Acronyms were merged together with the full-written form of concepts and their unique frequency counts were updated.
- Finally, similar meaning concepts and synonyms to one concept were combined. For instance, merging the concepts *knowledge transfer, transfer of knowledge* and *transferring knowledge* to the spelling form *knowledge transfer* resulted in a unique overall frequency count of 92 counts.

The application of these steps led to a final count list of 1362 concepts, which means that the original output list was reduced by 213 concepts.

4. Results of the content analysis of ECKM publications

This section describes and discusses the main results of the automated CA conducted. Figure 1 presents the overall distribution of publications observed in the analysis by year according to the data available in *Scopus* database.

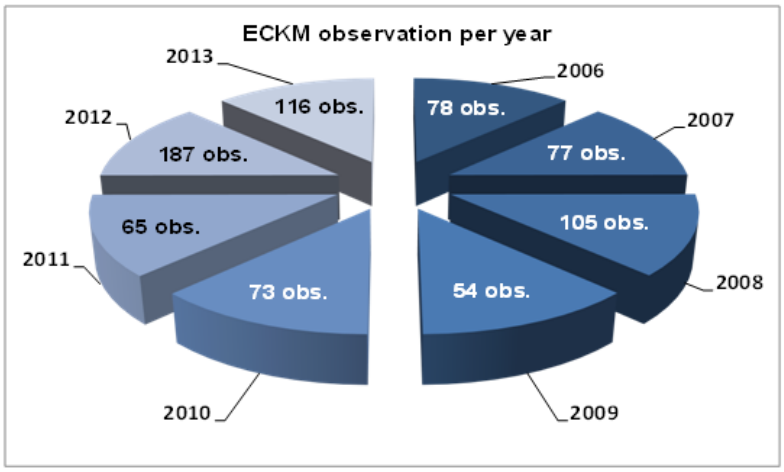

Figure 1: Overall distribution of publications per year

These numbers reflect the amount of totally available ECKM abstracts in the database and do not correspond to the effective number of printed ECKM publications in the observed time span. However, we believe that a total number of 755 publications is well appropriate to provide revealing insights into the analysis results, which help in answering our research questions.

4.1 Top keywords of ECKM publications

First of all, we would like to present some frequency count analysis results (c.f. table 1) of the first corpus of our dataset, which contains publication's keywords.

Table 1: Overview of top 20 keywords

Rank	Keyword	Unique frequency count	Rank	Keyword	Unique frequency count
1	Knowledge management	278	11	Knowledge management system	23
2	Knowledge sharing	83	12	Knowledge creation	22
3	Knowledge	53	13	Tacit knowledge	21
4	Intellectual capital	47	14	Ontology	16
5	Knowledge transfer	44	15	Social network	14
6	Innovation	36	16	Absorptive capacity	13
7	Community of practice	33	17	Social network analysis	12
8	Case study	28	18	Trust	12
9	Small and medium sized enterprises	28	19	Learning organization	12
10	Organizational learning	27	20	Web 2.0/Enterprise 2.0	12

As table 1 illustrates, *knowledge management* is on top of the keywords, which were determined by the authors of the papers, followed by the keywords *knowledge sharing* (83 counts), *knowledge* (53 counts), *intellectual capital* (47 counts) and *knowledge transfer* (44 counts). Furthermore, several organizational- and technology-related keywords seem to be very popular within the community. This can offers valuable clues to the main topics of published papers. These results serve as a basis to compare the frequency counts with key research topics identified during the analysis of titles and abstracts of the second corpus.

4.2 Key research topics of ECKM publications: Analysis results and discussion

This section discusses some main results of applied automated CA in terms of unique frequency counts of top emerging concepts.

Table 2 provides an overview of frequent occurring concepts identified through performing CA on available metadata. The table is divided into two parts. The right side entitled *Overall frequency count* lists the top 20 concepts and a few concepts from the lower end of the output table together with their frequency counts without differentiating between single and compound concepts. The left side entitled *Frequency count of compound concepts* lists the top 20 compound concepts and few compound concepts from the lower end of the output table according to their descending frequency count order. We distinguish between both views, because compound concepts provide more information about the context of a term (*capital* vs. *intellectual capital* or *learning* vs. *learning organization*). All Concepts are listed together with their original rank in the overall frequency counts table. This allows a precise comparison of the results among each other (e.g. *Model* on Rank 7 vs. *Framework* on Rank 15).

Due to the background of a KM conference, it is not surprising, that the concepts *knowledge, management,* and *knowledge management* appear on top of the ranking with an overall frequency probability of 30 % in the right table part in comparison to the top 20 listed terms. Similarly, *Knowledge management* occurs in the left table part with an overall frequency probability of 26 %. Topics like *research*, *learning and innovation* are under the overall top 20 concepts, which reveals a strong interest of the community to cope with such learning related issues. The list of compound concepts provides some additional useful insights. It is evident that knowledge issues like knowledge processes or knowledge types are under the top 20 compound concepts with 45 % for processes and 11 % for knowledge types. Management and organizational issues (competitive advantages, organizational knowledge, organizational learning, management systems and knowledge management systems) seem to be very popular within the community. However, success related issues (*success factor* with 22 counts) do not attract great research interest.

Furthermore, applying unique frequency counts led to more significant results as in the case of applying multiple frequency count procedure. For example, without unique frequency count, the concept knowledge was counted 5463 times. Through applying unique frequency count, the same concept results in only 702 counts. Given that concepts are counted only once per observation, this approach reduces result bias and enable the comparison of concept counts among each other.

Table 2: Overview of key research topics

Overall frequency count			**Frequency count of compound concepts**		
Rank	**Concept**	**Unique frequency count**	**Rank**	**Compound concept**	**Unique frequency count**
1	Knowledge	702	4	Knowledge management	400
2	Management	520	21	Knowledge sharing	139
3	Research	438	38	Competitive advantage	95
4	Knowledge management	400	40	Knowledge transfer	92
5	Technology	364	42	Questionnaire	87
6	Organisation	337	49	Intellectual capital	79
7	Process	307	50	Knowledge creation	76
8	Model	269	55	Organisational knowledge	67
9	Analysis	250	56	Knowledge management system	67
10	Information	249	58	Management system	64
11	Development	239	62	Tacit knowledge	61
12	Activity	205	69	Decision making	54
13	Learning	197	71	Small and medium sized enterprises	53
14	Companies	164	84	Organisational learning	46
15	Framework	164	89	Knowledge worker	43
16	Project	153	90	Community of practice	43
17	Support	152	93	Empirical study	41
18	Innovation	145	96	Research project	40
19	Case study	143	102	Explicit knowledge	36
20	Value	141	106	Organisational culture	36
452	Blogs	5	155	Success factor	22
547	Governance	4	558	Management support	4
1362	Youth	1	1361	Word wide web	1

The results of the output table allow having a closer look into concrete research topics, which bundle interrelated concepts (e.g. *knowledge sharing* and *knowledge transfer* as knowledge processes). Therefore, we would shed light on three such bundles namely *research paradigms and methods used, knowledge processes* as well as *technology*.

The comparison of the results in table 1 with the results in the left part of table 2 leads to the identification of some commonalities and differences. While knowledge processes and technologies are dominating the keywords table, the concepts in table 2 address a mixture of several issues like organisational topics (e.g. organisation, management, companies or project), research methods and innovation and learning aspects. Both tables are led by the concepts *knowledge* and *knowledge management* on one of the first three ranks.

4.3 Favourite research paradigms and research methods

Research methods are an important instrument to achieve reliable and valid study results regardless of the observed research field. Even if this topic is not only restricted to the field of KM, it is of great importance for the community. The analysis results, which comprise a variety of research methods applied by ECKM researchers proved this assumption. Therefore, we would shed light on some of our analysis results with relation to this topic.

In terms of applied research methods by the ECKM community, a mixture of different quantitative and qualitative approaches was identified. Figure 2 outlines a list of 20 most frequent methods identified.

As already described in section 3.2., different occurrences of semantically similar concepts were manually merged subsequently after finishing automated analysis process and their frequency counts were updated. We choose to label the aggregated research methods by a unique designation (e.g. *quantitative research* and *quantitative study* were merged to one concept and their frequency counts were updated).

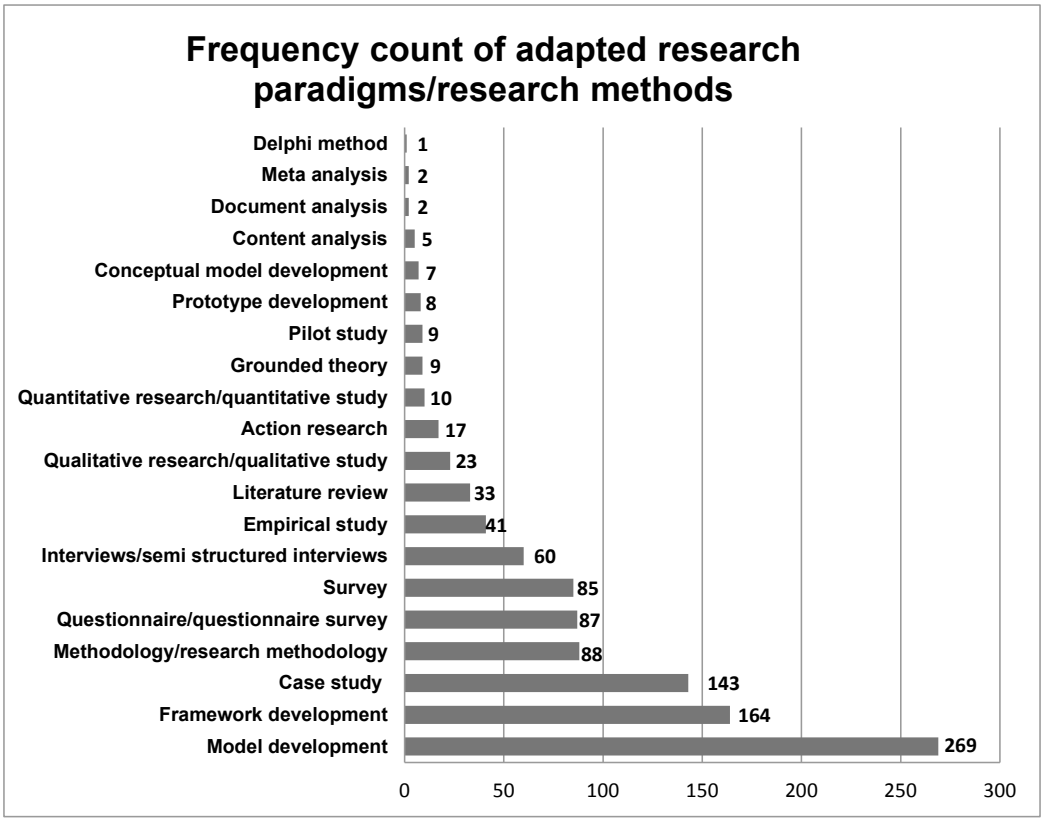

Figure 2: Frequency count of adapted research paradigms and research methods

As can be seen from the previous figure, the results include several research methods as well as research paradigms or approaches. For instance, *Model development (Rank 1)* and *framework development (Rank 2)* can be both interpreted as *research methods* (Rank 4), more precisely as methods, which fall into the bundle of *qualitative research* (Rank 10). The latter represent a research paradigm, which include different concrete research methods.

With regard to the analysis results in figure 2, *model* and *framework development* have been used as most favoured research methods followed by *case study methodology, questionnaires, surveys* and *interviews*. This tendency is in line

with previous observations as in the studies of Serenko et al. (2010), Dwivedi et al. (2011) or Croasdell et al. (2002). In total, *framework* and *model development* occur with a frequency probability of 41% compared to the overall occurrence frequency of all 20 methods. This illustrates that both topics have dominated ECKM research activities in the observed time span. Also, the comparison between the counts of qualitative and quantitative research shows a tendency to apply qualitative research methods (9 % vs. 4 %).

4.4 Favourite knowledge processes

With regard to the most popular knowledge processes, which were mentioned in the analysed publications (c.f. table 3) we identify strong research activity in writing publications, which belongs to topics like *knowledge sharing*, *knowledge transfer* and *knowledge creation*. Processes as the *usage, audit*, or *generation* of knowledge were mentioned less frequent.

Table 3: Knowledge processes and their frequency counts

Rank	Knowledge process	Unique frequency count
4	Knowledge management	400
22	Knowledge sharing	139
42	Knowledge transfer	92
52	Knowledge creation	76
156	Knowledge process	23
192	Knowledge acquisition	18
218	Knowledge exchange	15
296	Use of knowledge	10
310	Knowledge audit	9
383	Knowledge generation	7

However, the analysis results differ somehow from the results of previous studies. For instance, Heisig (2009) presented an overview of the six most frequently investigated KM activities. According to his analysis, the activities of *using, identifying*, and *creating* knowledge are top ranked followed by the activities of *acquiring*, *sharing*, and *storing* knowledge. An additional concept which results in a high frequency count was *technology (*364 counts for the general concept without distinguishing between several technology groups). This is not really surprising as technology is one of the main KM cornerstones (Biloslavo 2004) and a lot of related research can be found. We will therefore provide subsequently in table 3 the list of the top 10 concepts in the domain of technology.

Technology subsumes different concepts occurring during the analysis including Information and communication technology, ICT, IT system, software, system and tool. The concept *knowledge management system* occurs most frequently with 55 counts, which is unsurprising in the case of a KM conference. The investigated papers mostly deal with communication technologies, which bundle systems like wikis (14 counts), social media related technologies (11 counts) or blogs (5 counts). At all, communication technologies occur with a probability of 31 % with regard to all technologies listed in table 4.

Table 4: Research topics concerning technology use

Rank	Technology	Unique frequency count
56	Knowledge management system	55
142	Internet	23
208	Communication technology	15
213	Wiki	14
263	Social media	11
336	Prototype	8
366	Database	7
443	Blogs	5
473	Knowledge system	5
527	Decision support system	4

5. A classification scheme for ECKM publications

Based on the analysis results of CA, we will now present a classification scheme for ECKM keywords and research topics, which we developed based on the results of automated CA.

The scheme consists of 13 main categories with different subcategories up to a maximum detail level of five subcategories. After presenting the scheme below, each of the categories is described in detail. Presenting the whole scheme with all subcategories would go beyond the scope of this paper. Therefore, the scheme presented here is a fragment of the overall scheme and provide an overview of all main categories (e.g. A, B, C) together with their first detail level (e.g. A.1., B.2.).

Category A) Knowledge, Information & Data
- A.1. Knowledge
- A.2. Information
- A.3. Data

Category B) Organisation
- B.1 Organizational context
- B.2. Organizational & business characteristics

Category C) Management & leadership
- C.1. Leadership & management style
- C.2. Leadership cycle
- C.3. Management initiative, management practice, management process, management project
- C.4. Management discipline, management process
- C.5. Management system
- C.6. Decision maker, manager, top management
- C.7. Management strategy
- C.8. Management theory & practice

Category D) Information & communication technology, tool, software, IT system, infrastructure
- D.1. Communication technology, communication system, collaboration tool, collaborative technology
- D.2. Information technology, information technology tool, information system

Category E) Intellectual capital, learning & memory
- E.1. Intellectual Capital, intellectual property & intelligence
- E.2. Learning & training
- E.3. Memory & cognition

Category F) Education & research

F.1. Education, higher education, teaching
F.2. Literature
F.3. Research & practice, research design, research project, research study, analysis
F.4. Reference discipline

Category G) Design, development & maturity
G.1. Design, modelling
G.2. Development, implementation, manufacturing, production function, engineering
G.3. Service
G.4. Maturity, growth, improvement

Category H) Process
H.1. Process management
H.2. Process model, process based model, process modelling
H.3. Process innovation, process efficiency
H.4. Process type

Category I) Collaboration & communication
I.1. Collaboration, interaction, commitment, participation, partnership
I.2. Communication

Category J) Asset, capability, resource & need
J.1. Asset & resource
J.2. Capability & skill, capacity, competence, competency, skill, strength
J.3. Creativity, ideation, solution
J.4. Innovation, innovativeness
J.5. Expertise, experience, know-how, know-who, specialisation
J.6. Commitment, participation, mobility
J.7. Competition, competitiveness, competitive landscape
J.8. Need

Category K) Outcome & value
K.1. Outcome, impact
K.2. Value

Category L) Critical success factor
L.1. Capital, capitalism
L.2. Culture
L.3. Enabler & barrier
L.4. People & stakeholder
L.5. Strategy

Category M) Others

In order to develop the classification scheme, we applied the approach of inductive category development, which is one of the main approaches in qualitative CA (Mayring 2007). We critically discussed the resulting categories in our research group. We decided to name the categories by a general term which summarises best its different subcategories. For instance, all knowledge activities (e.g. *knowledge transfer, knowledge sharing,* and *knowledge dissemination*) were subsumed under *knowledge activities* and the latter was assigned to the main category *knowledge*. Together with the categories *information* and *data* we subsume *knowledge* to category A: *Knowledge, information and data*. The classification process was carried out bottom up and resulted in the subsequent main categories:

- **Category A) Knowledge, Information & Data:** is the core category of the schema and includes all the concepts related to knowledge, information, or data. For instance, the subcategory *knowledge* subsumes all knowledge artefacts such as activities and processes, knowledge types and knowledge domains or knowledge bases.
- **Category B) Organisation:** comprises organisation-related concepts like *working environment, companies, external environment, society, social context,* but also the different organisational characteristics which refers to the organisational structure and the firm level hierarchy.
- **Category C) Management, administration & leadership:** contains all the concepts, which define management practices (e.g. *decision-making, management support*), management disciplines (e.g. *change management, intellectual capital management* or *knowledge management*), or management systems.

- **Category D) Information & communication technology:** subsumes the summary of concepts with relation to technology. During our discussion rounds, we decided to split up this category into *communication technologies* and *information technologies* to better categorise the different technology types. Communication technologies are for example blogs, weblogs, and e-mail. Information technologies are for example business intelligence systems, databases and enterprise resource planning systems.
- **Category E) Intellectual capital:** comprises all the concepts which are related to the following topics: *Intellectual capital, learning, intelligence, training, memory,* and *innovation*. For instance, the subcategory *intellectual capital* originated from aggregating both subcategories *intellectual capital types* (e.g. *human capital* or *relational capital*) and *intelligence types* (*collective intelligence* or *emotional intelligence*).
- **Category F) Education, training & research:** was chosen to reflect all the concepts, which refer to the concepts *research and education, reference disciplines, development and maturity.* Examples of concepts within this category are the different research methods, theories, education and services such as call centres or customer services.
- **Category G) Design, development & maturity:** relates to concept, which belong to design and modelling aspects, issues of development and implementation activities and service related topics like quality and type of services.
- **Category H) Process:** contains all the concepts, which describe different process types. This may include but is not limited to Business process, decision-making process or knowledge process.
- **Category I) Collaboration & communication:** deals with concepts, which describe collaboration and communication activities as in the case of face-to-face communication or shared language.
- **Category J) Asset, capability, resource & need:** describe concepts like the different capability types (e.g. *dynamic capability*), creativity, intangibles and assets but also opportunities, needs and challenges described in the analysed publications.
- **Category K) Outcome & value:** was chosen to reflect anything, which has to do with *outcome* and *value*. This comprises for example advantages, performance types, costs, productivity or measures and measurement.
- **Category L) Critical success factors:** includes the different success factors, which affect the success of KM initiatives. For instance, culture , strategy and people build the base for this category
- **Category M) others:** is the next to last main category of the classification schema. Albeit different discussions and attempts to include the concepts of this category into one of the existing twelve categories, we share the opinion, that they do not fill well into the existing categories and should be handled therefore in a separate category. Concepts like *repositories, routines, security* and *standards* are representatives of this category.

Regarding the degree of concept count coverage by each category of the classification scheme, our analysis reveals the following results: Category F (*education, training & research*) was the most dominant category of the scheme and covers with an overall percentage of 15 % the majority of concepts with regard to their frequency counts. Second rank is shared by the categories A (*knowledge, data & information*) and C (management & leadership) with an overall percentage of 13 %. Category L (*critical success factors*) ranks third with 10 %. These findings give a concise picture of the percentage distribution and the topical focus of concepts per category and helps in positioning future research efforts.

6. Concluding remarks and limitations of the study

This study aims to contribute to a common view of key research topics in KM. The results reveal a strong interest of the community in different KM-related topics. Amongst others, KM technologies, knowledge and KM artefacts like knowledge processes and knowledge types and managerial issues are frequently investigated topics. It is also worth to mention, that a remarkable number of papers deal with learning and innovation-related issues. Notable is also a trend to use popular research methods like case studies, questionnaires, and interviews, but also a strong interest in KM frameworks can be stated. Based on the results of CA, a classification scheme with 13 main categories and different subcategories was developed. The scheme aggregates the analyses results and provides a consolidated and structured view on the overall research interests within the community.

The study, of course, has some limitations that should be mentioned at this point. A first limitation comes from the use of a KM dictionary with predefined concepts. The dictionary, which contains 3847 KM-related concepts was developed from a different KM publication sample in a previous research project. In order to reduce result bias, we matched the dictionary concept list with the keywords occurring in ECKM publications and added 155 additional

keywords, which were not part of original dictionary. However, we are confident that the dictionary with the corpus of newly included concepts is likely to occur in other KM publications as well. Further research will prove the coverage quality of the dictionary by repeating the process of manual CA on further sample data sets. Another limitation is the sample size, which does not cover all proceedings of ECKM. We obtained our data from *Scopus* database and data from 2014 and 2015 were not yet available. Nevertheless, we believe that a sample size of 755 publications is sufficient to provide reliable analysis results. Finally, the analyses in this study are mainly limited to frequency counts of concepts. Further research can extend the focus of analyses by performing trend analyses over time and analysing citation impacts of authors and publications. Both analyses will make more sense with larger datasets. A timespan of eight years is not adequate enough to provide reliable and interpretable trend analysis results for future.

The classification scheme provides a structured overview of all occurring topics in the observed publications. Together with the visualisation of the percentage of each main scheme category researchers and practitioners get a valuable instrument to identify white spots and already popular research topics in the community.

Since the development of a common ground of the KM discipline is still a challenging task, the findings help to discover emerging themes in KM research but also the preferred research methods. Both thematic shifts in the past and prospective future research priorities are pointed out. In summary, the results of the study contribute to stress the role of KM in building resilience. Furthermore, they can be seen as an attempt to reflect the identity and the research interests within the KM discipline and contributes to set up a cumulative research tradition.

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