WHAT TO DO WITH ALL THESE PROJECT DOCUMENTATIONS? – RESEARCH ISSUES IN REUSING CODIFIED PROJECT KNOWLEDGE

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Abstract

Project-based organizations invest a lot of time and effort into the extensive documentation of their projects. These project documents usually contain innovative knowledge and represent a significant source of information for the continual development of a learning organization. However, this codified project knowledge often remains untapped afterwards. A central problem in this context is the sheer information overload due to the often very large documentation stocks in project-based organizations. Against this background, this paper poses the following question: what can be done with the extensive project documentation after it has been created? To answer this question, two methodological approaches are combined. First, a literature review summarizes the current status quo of research in this special area. Then, expert interviews with IT project managers provide a deeper understanding of common practical problems. The combination of respective findings makes it possible to uncover research gaps and subsequently to define future needs for research. In sum, this paper formulates six research issues, which represent a starting point on the path to more comprehensive solutions for practically coping with large stocks of codified project knowledge.

Keywords: codified knowledge, project documentation, project knowledge management

1   INTRODUCTION

In the course of a project, many different documents are typically created, such as project appraisals, requirement specifications, project meeting minutes, or post-project reviews (Wysocki 2014). Based on the nature of projects (unique, complex, and collaborative endeavors; see PMI 2008), this documentation usually contains innovative knowledge and therefore represents a significant source of information for the continual development of a learning organization (Almeida & Soares 2014; Boh 2007; Schindler & Eppler 2003). In particular, the recorded project experiences can protect future projects from repeating previously made mistakes or having to resolve already solved problems (Disterer 2002; Koners & Goffin 2007). Nevertheless, although a lot of time and effort is often invested in documenting projects (Potter & Sakry 2004; Prencipe & Tell 2001), this codified project knowledge often remains untapped afterwards (Barclay & Osei-Bryson 2010; Boh 2007). A central reason for this is the sheer information overload due to the often very extensive documentation stocks in project-based organizations (Barclay & Osei-Bryson 2010). Haksever and Fisher (1996, p. 1) describe this situation as follows: "unless it is understood and managed well, information overload can be a critical information problem which prevents project managers from performing their tasks effectively." This strengthens the need for a structured coordination as well as comprehensive analysis of these large stocks of codified knowledge.

Increased attention has been paid to knowledge management in project environments in the past years (see, e.g., Ajmal et al. 2010; Almeida & Soares 2014; Boh 2007; Frey et al. 2009; Hanisch et al. 2009; Lech 2014; Reich et al. 2012; Zhao et al. 2015). Although much research exists which examines and describes the special issues in handling project knowledge, solutions for practically coping with information overload and the related problems of "project amnesia" are still rather rare. This paper therefore aims to summarize the current state of research on reusing project documentation (codified project knowledge) for the first time. In doing so, a central question is: what can be done with the extensive project documentation *after* it has been created? For example, how can relevant project knowledge be identified and structured in extensive document collections? Which solutions help to combine and synthesize the codified knowledge? The summarized research contributions should be contrasted with the common practical problems in handling large documentation collections, whereby potential research gaps are uncovered and future needs for research can be defined.

In summary, the following research question is addressed in this paper:

> *Do the previous research contributions completely cover the practical problems with the reuse of codified project knowledge, and if not, which future needs for research can be identified?*

Two methodological approaches are combined to answer this question. First, a literature review will summarize the current status quo of research in this special area. Then, expert interviews with IT project managers should provide a deeper understanding of common practical problems as well as the requirements on effective reuse of codified project knowledge. The combination of respective findings makes it possible to compare the previous research contributions with problems in practice, whereby gaps in research are uncovered and future research issues can be defined.

The remainder of this paper is divided into the following sections: Section 2 discusses the backgrounds of codified project knowledge as well as the common problems with its reuse. Section 3 introduces the methodology of this study. Section 4 presents the findings of the respective investigations. Section 5 contains a comparison of the findings as well as the identification of potential research issues. Section 6 summarizes the core statements of the paper and provides an outlook.

2   REUSING CODIFIED PROJECT KNOWLEDGE

In the framework of knowledge management, two knowledge strategies can generally be distinguished: personalization and codification strategy (Hansen et al. 1999). Personalization stands for person-to-person knowledge transfer. This means, in project context, that experiences are personally communicated and exchanged between project team members (Barclay & Osei-Bryson 2010). Codification, on the other hand, stands for people-to-document knowledge transfer. Hansen et al. (1999, p. 1) describe the core idea of codification strategy as follows: "Knowledge is carefully codified and

stored in databases, where it can be accessed and used easily by anyone in the company." This means that project experiences are put down in writing, stored and made available in documents (Barclay & Osei-Bryson 2010). In project business, this occurs in different forms of project documents, but particularly in post-project reviews (Anbari et al. 2008; Nelson 2003). Typically, project-based organizations invest a lot of time and effort in the codification of respective project experiences (Potter & Sakry 2004; Prencipe & Tell 2001). The subsequent reuse of this codified project knowledge enables a knowledge transfer between projects so that future projects can learn from the lessons (i.e. successes and failures) of past projects (Disterer 2002; Koners & Goffin 2007). Several empirical studies have already provided proof that the reuse of such knowledge has a positive influence on the success of future projects (see Hanisch et al. 2009; Hong et al. 2008; Kotnour 2000; Kululanga & Kuotcha 2008).

Although the usually extensive stocks of project documentation contain large information potentials for a profound project knowledge management (PKM; see Frey et al. 2009; Hanisch et al. 2009; Lech 2014), the connected information overload is also the central problem in the reuse of this codified knowledge (Barclay & Osei-Bryson 2010; Haksever 2000). Haksever and Fisher (1996, p. 1) succinctly summarize the problems with this issue:

> Project organisations and their members are affected by the ever increasing quantities and varieties of information they are required to process. However, even the most able project managers are limited in their capacity to process information. […] The combination of surplus information and finite information processing capacities has led to the phenomenon called information overload.

Project managers have access to a large quantity and variety of project documents and are simply overwhelmed with the extensive evaluation of these. The consequence is that relevant lessons from completed projects often remain unexploited in future projects (Barclay & Osei-Bryson 2010; Boh 2007). Many researchers have already tried to better understand the underlying problems in the context of project management and make suggestions for solving the information overload (see Ajmal et al. 2010; Almeida & Soares 2014; Antoni et al. 2005; Barclay & Osei-Bryson 2010; Frey et al. 2006; Mainga 2010; Newell et al. 2006; Oluikpe et al. 2008; Prencipe & Tell 2001; Reich et al. 2012). Based on this research, a total of six core statements can be extracted: First, suitable information systems, procedures, and computer-aided analysis techniques are required which can systematically manage the extensive stocks of documentation and can retrieve, combine, and summarize relevant information (see, e.g., Oluikpe et al. 2008). Second, reduced but more need-based codification of knowledge is required. This addresses the problem that a lot of data is generated and available, but only comparably little information is really relevant for future projects (see, e.g., Reich et al. 2012). Third, the extensive stocks of documents must be organized in a clearer manner for later access and made available in a more functional way (see, e.g., Almeida & Soares 2014). Fourth, a more effective coordination and thematic assignment of information through conceptualized content structures (e.g., according to specific processes, products, or situations) should enable a need-oriented use of knowledge (see, e.g. Antoni et al. 2005). Fifth, personalized and automatic notification (push process) should proactively provide team members with a more individualized "need-to-know" basis of knowledge (see Prencipe & Tell 2001). Sixth, a strategy and culture are necessary which support a project-oriented management of knowledge and define the required capacities, processes, and responsibilities for sharing and reusing codified project knowledge (see, e.g., Almeida & Soares 2014).

In the past decade in particular, several researches tried to solve the problem areas described here. In the following, this paper summarizes the respective research efforts and assesses their completeness.

3   METHODOLOGY

The findings of two methods are used and combined for answering the research question (see Figure 1). The literature review aims to summarize the research on reusing codified project knowledge in a structured way (Section 4.1). The goal of the expert interviews is to get a deeper understanding of information overload and the related problems in project management (Section 4.2). A following contrast of the respective findings evaluates an adequate problem orientation of the previous research efforts and makes it possible to identify future research issues (Section 5).
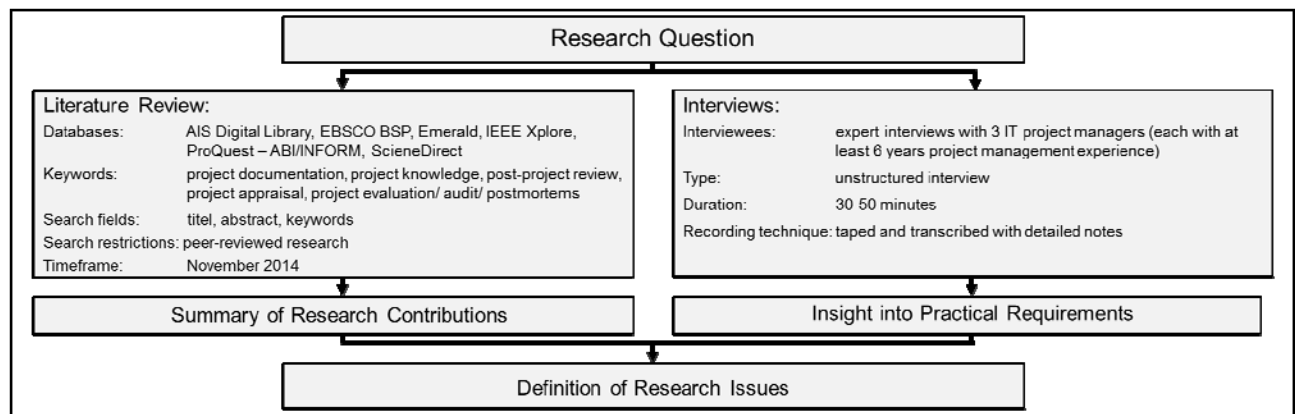
Figure 1.   *Conceptual research framework*

The conception and execution of the respective methods will now be presented in more detail.

- **Literature review**: A literature review is a useful method for summarizing previous research contributions and identifying central topics (Webster & Watson 2002). Since the implementation of such reviews can vary significantly, transparent documentation is necessary (vom Brocke et al. 2009). The six characteristics from Cooper (1988) are used for this purpose: (1) The *goal* of the review is to summarize the research on reusing project documentation (codified project knowledge) in a structured manner. (2) The *focus* is on peer-reviewed research (journals and conference proceedings) which supplies practical project management with prescriptive solutions. (3) A neutral position is taken as the *perspective*, i.e. structuring is performed, but no critical assessment of the research is done. (4) The *coverage* encompasses a keyword search in 6 literature databases (see Figure 1 for details). The used keywords, covering types of project documents and project knowledge (see also Figure 1), have been identified mainly on the basis of Disterer (2002). Relevant articles have been preselected using suitable titles and abstracts and then completely evaluated. Then, forward and backward searches were done, as recommended by Levy and Ellis (2006). (5) The *organization* of the review follows a primarily methodical process in which the articles are organized using predefined categories. (6) The relevant *audience* for the results are primarily researchers and practitioners interested in IT project management.

- **Expert interviews**: Interviews are generally well-suited "to elicit detailed, in-depth accounts of the interviewee's experiences and perspectives on specific issues" (Kaplan & Maxwell 2005, p. 32). Expert interviews were therefore done with three experienced IT project managers (PM) from different industries: PM 1 (automotive industry); PM 2 (insurance); PM 3 (retail). The participating experts are practice-oriented partners in this research endeavor, and particularly interested in advancing their reuse of project documentation. Each PM has at least 6 years project management experience and profound expertise in leading IT projects with various scopes (e.g., system deployment projects) and sizes. Through the cross-industry approach, it is intended to cover various perspectives and thereby to gain a broader insight into the complex problems. Unstructured interviews (face-to-face) were done which are well-suited for the free, profound discussion of phenomena (Myers & Newman 2007). Two open-opened questions were paramount: (1) Were historical project documentation used for the conception of future projects, and if so, how intensely? (2) Which requirements are made in practice on effective and efficient reuse of these document stocks? If not already mentioned, the relevance of the six aspects outlined in Section 2 were subsequently discussed, one after the other. The interviews lasted between 30-50 minutes and were recorded, then transcribed and supplemented with notes. In a subsequent qualitative content analysis (see Mayring 2000), regular core statements were identified and summarized.

4 FINDINGS

4.1 Findings from the Literature Review

The relatively broad keyword search in the 6 literature databases brought a total of 579 articles to light (without duplicates). In the selection process (screening of the titles and abstracts), 47 articles were estimated to be potentially relevant and were subsequently completely evaluated. Then, 8 articles were

excluded due to lack of relevance. In the scope of the forward and backward searches, 6 further relevant articles were identified. Therefore, 45 articles were finally available for the review. The articles were divided into four categories of knowledge management processes using the descriptions from Bose (2003): *Knowledge Creation* (i.e., knowledge acquisition or representation on the basis of project documentation), *Knowledge Structuring* (i.e., defining, storing, categorizing, indexing, and linking of project documents and contents), *Knowledge Dissemination* (i.e., knowledge sharing and location, which includes searching (pull) and subscribing (push) to relevant documentation) and *Knowledge Application* (i.e., combining, analyzing, and ultimately reusing codified project knowledge for decision-support or problem-solving). Bose describes possible options for the use of codified knowledge, which helped to organize the examined articles into subgroups according to their areas of application. Since an article can cover several application areas at once (e.g., the use of an initial project knowledge taxonomy for implementing a more detailed (ontology-based) knowledge conceptualization), some articles appear in several sub-categories (see Table 1).

Category	Application Area	References
Knowledge Creation		
	Document Adaptation	Chen & Tsai (2011)
	Document Content Validation	Arthur & Stevens (1989); Campbell et al. (2013); Xu et al. (2011)
Knowledge Structuring		
	Project Knowledge Taxonomies	Dikmen et al. (2008); El-Diraby & Zhang (2006); Kamara et al. (2003); Matsumoto et al. (2005); Mena et al. (2010); Mena-Nieto et al. (2011); Ozorhon et al. (2014); Tan et al. (2007); Tan et al. (2006); Wu & Wang (2007); Yildiz et al. (2012)
	Knowledge Mapping	Chen & Lin (2012); Lin et al. (2006); Liu & Hsu (2004); Yildiz et al. (2012); Yoon et al. (2010)
	Knowledge Conceptualization	Chen & Lin (2012); Chia-Hsiang et al. (2008); Chourabi et al. (2008); El-Diraby & Zhang (2006); Fang et al. (2011); Kamara et al. (2003); Lin et al. (2006); Matta et al. (2011); Ozorhon et al. (2014); Tan et al. (2007); Tan et al. (2006); Wu & Lin (2010); Wu & Wang (2007)
	Document Classification	Al Qady & Kandil (2014); Al Qady & Kandil (2013); Caldas et al. (2002); Caldas & Soibelman (2003); Choudhary et al. (2009); Jiang et al. (2013); Soibelman et al. (2007); Ur-Rahman & Harding (2012)
Knowledge Dissemination		
	Search & Knowledge Retrieval	Blessing et al. (2001); Choudhary et al. (2009); Fan et al. (2014); Fang et al. (2011); Jiang et al. (2013); Matta et al. (2011); Soibelman et al. (2007); Wu (2011); Wu & Wang (2007); Yildiz et al. (2012)
	Summarized Knowledge Reports	Choudhary et al. (2009); El-Diraby & Zhang (2006)
	Personalized (Push-)Notification & Distribution	Mena et al. (2010); Mena-Nieto et al. (2011); Wu & Lin (2010)
Knowledge Application		
	Knowledge Combination & Discovery	Carrillo et al. (2011); Carrillo et al. (2010); Choudhary et al. (2009); Hébrail & Marsais (1994); Jiang et al. (2013); Liu & Hsu (2004); Loh et al. (2002); Menon et al. (2005); Schalken et al. (2006); Wu & Lin (2010)
	PKM Competencies & Responsibilities	Carbone & Gholston (2004); Davidson & Rowe (2009); Franco et al. (2004); Blessing et al. (2001); Tan et al. (2006); Tan et al. (2007); Kamara et al. (2003); Gregorio (2012)

Table 1.   Findings from the literature review

In the following, the four categories are presented with their respective application areas.

- **Knowledge Creation**: Two fields of research were identified in the context of knowledge creation. In one, Chen and Tsai (2011) worked with the topic of document adaptation, i.e. with the question of how existing project documentation can be used and adapted to more efficiently structure the elaborate creation of new documents. The content-related validation of product documentation is another field. Here, documents are checked to determine whether the described content is high-quality and complete, or whether the underlying instructions must be revised and specified for future documentation (see, e.g., Campbell et al. 2013).
- **Knowledge Structuring**: Four fields of research can be summarized for the structuring of codified project knowledge. First, the more need-oriented definition of project experiences to be codified using descriptive project knowledge taxonomies (see, e.g. Mena et al. 2010). Second, the automatic clustering and mapping of documents and knowledge (e.g., based on topic maps). Third, the conceptualization of knowledge according to contexts of project work (e.g., project phases, specific tasks, or products). This is often related to the development of ontology-based databases, which enable a structured storage and retrieval of knowledge in computational form. Fourth, the automated classification of heterogeneous documents according to predefined content-related categories.
- **Knowledge Dissemination**: There are three fields of research with the goal of more effective knowledge dissemination. First, the solutions for the targeted search and retrieval of specific knowledge in extensive stocks of data are an already intensively researched area. Second, solutions for the automated summary and distribution of compressed information were suggested (see, e.g., Choudhary et al. 2009). Third, first researchers addressed the automated compilation and

notification of knowledge (push-based dissemination) tailored to the needs of specific groups of project worker (e.g., through a subscription to specific projects or knowledge categories).

- **Knowledge Application**: In the context of knowledge application, two fields of research can be summarized. First, knowledge combination and discovery, i.e. the synthesizing and exploratory analysis of new, relevant knowledge based on combined document collections. Here, innovative textual analysis processes (e.g., text mining) for discovering patterns and structures in the typically textual project descriptions were regularly suggested. Second, organizational requirements for effective PKM were discussed. Here, for example, the creation of awareness for the reuse of project documentation is an issue as well as the implementation of responsibilities, supporting processes, and capacities in the context of PKM (e.g., integration of full-time project knowledge managers).

4.2   Findings from the Interviews

The expert interviews provide more detailed insight into knowledge management practice in project environments. All three PMs confirmed in general that, in the context of their IT projects, a large amount of effort is made for project documentation (particularly project proposals and post-project reviews). All three PMs use project management information systems (PMIS) which support the collaborative preparation, storing, dissemination and, in part, reuse of project documents. The actual reuse of this available codified project knowledge, however, varies greatly. PM 1 (automotive) and PM 3 (retail) especially use sporadic retrievals of individual documents of obviously comparable projects. These documents were manually examined and primarily used to get an impression of common project conditions or to identify specific domain experts. PM 2 (insurance) for the most part neglects to systematically reuse existing project documentation ("It would simply be too much reading. I don't have enough time for this in project business"). All three PMs confirmed information overload as the central problem in the profound reuse of historical project documentation. Based on this, the question of which prerequisites must be fulfilled for more intensive reuse of this codified project knowledge could lead to a more detailed understanding of the issues described in Section 2:

- *Support by suitable systems, procedures, and techniques.* All three PMs affirmed that more effective support in the retrieval, combination, and computer-aided analysis of large stocks of documents would be very valuable. In doing so, it was specially emphasized that an examination of individual isolated documents does not create a representative view of repeated mistakes or success factors. In fact, it would be helpful to be able to compare and synthesize a large number of similar projects efficiently and to extract and validate core statements.

- *Standardized creation of relevant project knowledge.* In general, there are two points of criticism concerning the present project documentation. First, the quality of the documentation is often inadequate, since, for example, old documents are often simply copied and partially overwritten (PM 2 and 3). Second, the information really relevant for project management is rarely documented (such as, e.g., teamwork experiences, organizational problems, helpful cooperation, or experts in the field). PM 2 summarized the problem as follows: "Larger and larger stocks of documentation are made available to us every day. We do not need more information; we need the right information." Standardized procedures and the exact definition of relevant content (such as project knowledge taxonomies) are necessary to support the complete collection of relevant project knowledge.

- *Structuring of comprehensive stocks of documents.* A clear organization of large stocks of documents is essential for not losing track and for being able to easily find the relevant information. PM 3: "Our projects usually cross over divisions. Document storage according to departments or even time periods is therefore not very helpful." To solve this problem, clearer storage structures and procedures for the automatic organization of documents would be useful.

- *Conceptualization of codified project knowledge.* The PMs need information for certain purposes (e.g., system developments or business process improvements) and in the context of specific situations (e.g., planning or ad-hoc problem-solving) or processes (e.g., product development processes). A conceptualization (or contextualization) of project knowledge according to such purposes, situations, or processes can greatly simplify need-based access. PM 1: "Instead of reading documents with long texts for two or three relevant pieces of information, previous tagging of this content according to exact areas of application would make a lot of things much easier." The development of such concepts and their transfer into structured knowledge bases would therefore be helpful.

- *Person-specific notification and knowledge dissemination.* The PMs emphasize their wish for knowledge repositories which take into account their individual needs and areas of interest and can thereby limit the scope of potentially relevant documents. PM 3: "It would be helpful if the database could come to me and tell me what I should look at for my project, instead of me going to the database and going through all the files every time." Personalized and automated notification and dissemination of (new) relevant content would be of assistance here.
- *Lack of awareness, capacities, and responsibility.* "Why we don't use historical project documentation? The danger of losing precious time is simply too great. Besides, we don't have to, or no one feels responsible for doing so" (PM 2). This statement describes the organizational or, partially, cultural problem very clearly. On one hand, there is a lack of awareness, which means that the benefit of reusing codified project experience is not known. On the other hand, there is a lack of clear instructions as well as correspondingly planned organizational responsibilities and capacities.

5   DISCUSSION AND RESEARCH ISSUES

In this section, the current status of research is contrasted with the practical requirements discussed (see Table 2). In doing so, it can be illustrated which research contributions address which problems, which problems have already been intensively researched and which have been largely neglected until now. The appropriate evaluation of the application areas (e.g., "requirement is fully addressed" etc.) was supported by an interpretation of the associated articles and their specific contributions. The underlying question was: to what degree are the practical problems addressed by the respective area? Based on this comparison as well as taking into account the basic understanding of practical requirements achieved during the interviews, the six research issues described in the following were formulated by two researchers. Subsequently, these issues were discussed, evaluated, and partly refined together with the participating experts in follow-up meetings.

Research Contributions		Practical Requirements					
Category	Application Area	Support by suitable systems, procedures, and techniques	Standardized creation of relevant project knowledge	Structuring of comprehensive stocks of documents	Conceptualization of codified project knowledge	Person-specific notification and knowledge dissemination	Organizational awareness, responsibilites, and culture
Knowledge Creation							
	Document Adaptation	o	+	-	-	-	-
	Document Content Validation	o	+	-	-	-	-
Knowledge Structuring							
	Project Knowledge Taxonomies	-	+	o	o	-	o
	Knowledge Mapping	+	-	+	o	-	-
	Knowledge Conceptualization	+	o	+	+	o	-
	Document Classification	+	-	+	o	o	-
Knowledge Dissemination							
	Search & Knowledge Retrieval	+	-	o	o	o	-
	Summarized Knowledge Reports	+	-	o	o	o	-
	Personalized Notification & Distribution	+	-	+	+	+	o
Knowledge Application							
	Knowledge Combination & Discovery	+	-	+	-	-	-
	PKM Competencies & Responsibilities	o	+	+	o	o	+
Notes: "+" = requirement is fully addressed; "o" = requirement is partially addressed; "-" = requirement is not addressed							

Table 2.   Comparing research contributions and practical requirements

Validation of documentation quality. Project-oriented organizations invest a lot of time and energy into the extensive documentation of their projects. But how is the quality of documentations to be estimated? Or to put it another way: Is it worth the effort? The respective validation of the (textual) document quality has hardly been researched up to now (see Campbell et al. 2013) and offers a promising research perspective in light of the great effort needed for documentation.

Project knowledge taxonomies. A shared understanding of project knowledge is a prerequisite for its consistent collection and reuse in the course of a project. Without such standardized content structures, project documentation cannot completely transmit the relevant knowledge (Potter & Sakry 2004; Reich et al. 2012). Respective project knowledge taxonomies have already been suggested many times over. However, in the review, it became clear that these taxonomies are as different as domains, companies, and projects can be. The development of domain-specific taxonomies thereby still offers interesting research opportunities for IT project management.

Project knowledge conceptualization. The conceptualization of codified project knowledge is an important mechanism for overcoming information overload and ensuring targeted, i.e. topic-, situation-, or process-specific knowledge storing, sharing, and reuse. This also prevents possible misinterpretations and use of knowledge in unsuitable situations (Alavi & Leidner 2001). In this context, the development of conceptualizations suitable for specific domains and IT projects involves many interesting questions. Furthermore, the development of corresponding ontologies (specifications of a shared conceptualization of a specific domain) and their integration into database structures and retrieval mechanisms involves interesting questions (see Uschold & King 1995). Research with focus on the special context of IT project management is still rare and poses interesting research questions.

Personalized (push) notification & knowledge distribution. Potentials for research arise in the area of automated, i.e. proactive (push process) and person-specific notification and distribution of project knowledge (e.g., through a subscription to specific projects or knowledge categories). The need-related provision of project knowledge which is oriented on the special interests and needs of the project members can greatly reduce the overload of unfiltered and thereby partly irrelevant information.

Knowledge combination & discovery. The isolated examination of individual project documents bears the risk of discovering or verifying knowledge with less representative potential as would be the case with the combined evaluation of many documents. Against the background of the large quantities of available documents, an efficient system support is therefore indispensable. The previous research on knowledge combination (merging or synthesizing codified project knowledge) provides first approaches for discovering valid project knowledge which can be expanded on and tested in further research.

PKM strategy and culture. The aspects of a PKM strategy (see, e.g., Hanisch et al. 2009; Lech 2014) should contain a more intense debate with the management of codified project knowledge (Almeida & Soares 2014). This involves, for example, the definition of corresponding work instructions or the integration of organizational responsibilities (e.g., project knowledge manager). Moreover, there is often a lack of a corresponding awareness that potentially helpful information could be available, i.e. also of the motivation to use it (see Newell et al. 2006). The creation of a PKM culture (e.g., through incentives or the distribution of success stories) offers interesting research perspectives (see Frey et al. 2009). Such "soft" factors are researched comparatively rarely and offer interesting research opportunities.

6 CONCLUSIONS AND OUTLOOK

"This report, by its very length, defends itself against the risk of being read" (Winston Churchill). This study takes up the problem described in the quote and poses the question of how the large available stocks of project documentation can be reused in the context of future projects. In doing so, the previous research contributions were compared with the common practical requirements in this field and six research issues were identified. The formulated research areas offer a starting point towards more comprehensive solutions and are promising, since the great information potentials of codified project knowledge are often opposed by non-observance of these potentials. Ignoring this rich wealth of experience leads directly to knowledge loss which project-based organizations can no longer afford in light of constantly growing project requirements. In this context, it must also be mentioned, however, that codified knowledge is only one side of the coin. There is an active discussion in the current literature on the role of codified (i.e. explicit) knowledge in contrast to tacit knowledge (Almeida & Soares 2014).

This study is of course not without limitations. First, a literature review usually cannot find and evaluate all potentially relevant articles. Nevertheless, this review is based on a comparatively extensive search, meaning a representative picture of the current state of research should be presented. Second, the interviews from only three IT project managers surely do not have to be representative. The interviews in this study, however, have the main purpose of making the problems often discussed in theory more understandable for the definition of research issues. Third, although the identification of the research gaps was supported by a structured approach, the identification and formulation of the research issues is subjective to a certain degree and is influenced by the authors. A further discussion and evaluation with experts from research and practice (e.g., through a Delphi study) will therefore be helpful in the subsequent research process. Fourth, the discussion of the findings presented here is very stinted. That is why the results will be handled in more detail in later publications.

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