The Influence of Cultural Values on Knowledge Sharing across Organizational Boundaries

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Abstract

In order to fully derive business value from the knowledge of employees, companies introduced various knowledge management initiatives to overcome boundaries. However, knowledge sharing is still a delicate process because the willingness to share knowledge might be hindered by the lack of favorable cultural antecedents or functional and geographic distances between the persons involved. Existing studies concerning knowledge cultures have discovered isolated cultural values favorable for individual knowledge sharing. However, studies taking cultural elements and boundary spanning knowledge sharing into consideration are still missing. To close this gap, a qualitative and inductive study has been conducted in an Austrian engineering company. We researched cultural antecedents for knowledge sharing between project teams. The results provided by the analysis technique of GABEK® indicate that there are several cultural elements that foster knowledge sharing across boundaries as well as starting points for managers and employees to develop a knowledge culture.

1. Introduction

The management of knowledge from in- and outside the company is highly significant [1] in the knowledge society [2]. Knowledge resources yield high returns because knowledge is seen as the most valuable resource, which is rare and difficult to imitate or substitute [3]. Thus, managing knowledge across organizational boundaries is of vital importance for developing skills and competencies, sustaining competitive advantages, and increasing value [4]. Especially, knowledge sharing is necessary in order to disseminate newly created knowledge and develop collective organizational knowledge [5], also across organizational boundaries.

The dissemination of knowledge across boundaries can be analyzed on several levels: between companies in strategic alliances [6,7], between companies and customers [8], between functional units and departments [9] and between professional groups [10]. As organizational boundaries often distinguish groups from each other by creating subgroups with subcultures [11], different values, attitudes and beliefs might negatively affect knowledge sharing [9,10,12]. If knowledge sharing is associated with risk-taking because one never knows how trustworthy the sender or receiver of the knowledge is [13], knowledge sharing across boundaries will not take place. Similarly, the absence of a thorough knowledge about the other groups might hamper the development of trust necessary for knowledge dissemination [14]. If the possession of knowledge is seen as a means for power [15], knowledge sharing can be hindered because employees fear to loose their unique position within the company [16]. To overcome these cultural barriers for knowledge sharing, a knowledge culture as a framework of shared meanings and norms can reduce the uncertainty for engaging in knowledge sharing activities "*by supplying assumptions and expectations to fill in the voids*" [17]. However, the discovered cultural values, such as trust, care, and fairness [14,18-21], do not focus on knowledge sharing across organizational boundaries.

In this paper, we study necessary cultural antecedents of knowledge sharing between project teams on a team level. Although project teams are very common in today's companies [22], little research has been conducted analyzing this level of cross-boundary knowledge sharing. This requires an exploratory and inductive research approach [see also grounded theory; 23] in order to find evidence for our research questions: (1) how does knowledge sharing takes place between project teams? (2) which manifestations foster/hinder this kind of knowledge sharing? (3) which values are antecedents for cross-boundary knowledge sharing? The aim of the study is to provide qualitative insights into cultural antecedents that foster intra-organizational knowledge sharing across functional boundaries. In an Austrian engineering company, we examined which elements affect the boundary-spanning knowledge sharing processes. Our results show that certain values and manifestations enable these knowledge sharing activities. These cultural elements influence each other leading to starting points for managerial activities in order to develop a knowledge culture. Furthermore, our results show that introducing and living a knowledge culture is not only a responsibility of the management but of all employees.

In the following, we first provide the theoretical basis regarding knowledge sharing, especially across organizational boundaries and corporate culture. We then deal with characteristics of a knowledge culture derived from literature focusing on general knowledge sharing processes and explain the design of our empirical study. The

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results are shown by means of figures derived from the analysis with the methodology of GABEK®, which will be discussed in detail. Finally, we provide managerial implications regarding the method used as well as the results of our study.

2. Knowledge sharing across organizational boundaries

Knowledge sharing has received much attention [5] because it is needed for innovation, organizational learning, development of new skills and capabilities, increase of the company's productivity, and maintenance of competitive advantages [13,19]. Thus, the ability of transferring knowledge from one person or unit to another significantly contributes to the organizational performance of firms [24]. We propose that knowledge sharing is more than transferring information, it is defined as „*...the provision or receipt of task information, know-how, and feedback regarding a product or procedure*" [25], which implies that sharing knowledge is a social, interactive and complex process including tacit and explicit knowledge [26].

In literature, knowledge sharing is mostly studied on the individual level [5] because individuals are the actors, who have to engage in this process [24], and tacit knowledge, which is difficult to share over large distances [27], can be studied at this level. With the failure of the "computational paradigm" of knowledge management, which focuses on the explicit dimension of knowledge relying heavily on ICT for its diffusion and storage [28], the attention shifted toward the "organic paradigm" [28]. Here, knowledge management is seen more dynamically including people-centric problems, such as motivation and personality factors as well as situational and organizational factors [29]. However, teams, departments and networks are mostly described in order to show their enabling function for individual knowledge sharing [30] or to provide a closed setting for research [18,25].

Knowledge sharing across organizational boundaries can take place between companies, where decisive factors for successful knowledge dissemination are partner similarity [6], expectations and trust [7], and tie strength [31]. Also differences in national cultures influence how effectively knowledge can be shared [32,33]. Furthermore, companies are more and more engaging customers into innovation processes trying access their experiences and knowledge (see discussion about "open innovation") [8,34]. Within organizations, knowledge sharing between functional units, departments and professional groups is crucial in order to create value from distributed knowledge in the company [9,10]. Here, knowledge sharing can take place by means of "itinerant members", i.e. employees that work temporarily in other groups [35], or "boundary objects", i.e. abstract or concrete objects that are passed on from one group to the other [36,37]. For cross-boundary knowledge sharing, effective communication, a common basis, and operational proximity have been discovered to be necessary [9,10] leaving out cultural characteristics.

Cross-boundary knowledge sharing can also take place between project teams. Project teams are permanent or semi-permanent teams to which individuals are assigned. These groups interact regularly in order to achieve a certain goal before a certain deadline [38-40]. Although companies use more and more project teams for work organization [22], little research has been conducted analyzing this level of cross-boundary knowledge sharing. However, the results project teams create and their experiences they gather regarding project management are valuable for the organization and should be shared with other project teams in order to foster organizational learning [24]. This might be difficult as knowledge sharing is a delicate process depending on cultural characteristics of the companies and the subgroups [14,41-43].

3. Characteristics of a knowledge culture

Corporate culture helps to understand patterns and orderliness of behavior within companies in order to understand why different initiatives succeed or fail [44,45]. According to the "dynamic perspective" [46,47], corporate culture is defined as „*... the basic beliefs commonly-held and learned by a group, that govern the group member's perception, thoughts, feelings and actions and that are typical for the group as a whole.*" [48]. Thus, corporate culture is seen in a holistic way including manifestations, basic assumptions, and shared values which influence the thinking, behavior and feelings of employees [47,49] and in turn are influenced by all company members [50-52]. Due to shared cultural values, coordination, internal control, focus on common goals, motivation, and identification can be gained, which might positively influence the company performance [53-55].

Regarding knowledge management initiatives, it is said that they are only successful if they are in accordance with the cultural perceptions in the company [12]. In this tradition, the terms "knowledge culture" [56], "learning culture" [49], and "knowledge-friendly culture" [12] evolved. Corporate values and manifestations influence if and how knowledge is shared [57-59]. However, cultural perceptions are also influenced by actions if they have proven successful. Therefore, good experiences with the introduction of a knowledge

management system might change the values towards knowledge processes [60].

Up to now, several studies try to identify corporate values and manifestations mainly in quantitative research analyzing isolated cultural elements and their influence on knowledge management. Favorable values are care [18,19], trust [14,20], team orientation [61,62], autonomy [63], risk orientation [64], fairness [21], long-term orientation [61], openness [65], and learning orientation [66]. Favorable manifestations for knowledge sharing and creation are means for communication [67,68], incentive systems [56], top management commitment [69], a knowledge vision [58,70], IT [27,56,67,71,72], resources [56,73], and processes [56].

However, detailed studies integrating manifestations as well as values and focusing on single knowledge processes, such as knowledge sharing between project teams, are rare [74]. Furthermore, these studies mainly address the Northern-American or Asian countries [21,62,73,75] leaving out potential differences due to national culture variations [76]. Therefore, we study cultural antecedents for cross-boundary knowledge sharing in an Austrian company.

4. Aim of the study, study design and GABEK®

This study aims at discovering which cultural values and manifestations (positively and negatively) influence knowledge sharing processes between project teams. In order to provide empirical evidence and as no previous results are available at this level of detail, a qualitative and inductive research design was applied [77-80] following a grounded theory approach [23]. Our research site was an Austrian engineering company.

We used interviews, observations, group discussions, and documents (see method triangulation) for our study [77-79]. More precisely, we developed an interview guideline in order to examine the perception of cross-boundary knowledge sharing. We asked 15 interviewees (average interview duration 45 minutes) from three different project teams, questions about their project team, how knowledge sharing with other teams takes place, how it worked, which factors enabled/hindered knowledge sharing between the teams, and how they describe their company. The three project teams (10-15 members) were selected by the company. The project team members could decide voluntarily if they wanted to be part in this study. We ensured that our interview partners were as diverse as possible regarding age, length of employment, project team status etc. We observed cultural manifestations using field notes every time we entered the building (12 times). We developed a grid including behaviors of employees, the building and offices, status symbols etc. Furthermore, we obtained internal documents such as the company's mission statement and code of conduct. After the first data analysis, group discussions were initiated to validate the results and aggregate the data to the team-level.

For data analysis, we used GABEK® ("GAnzheitliche BEwältigung von Komplexität" - Holistic Processing of Linguistic Complexity © Josef ZELGER, Innsbruck). GABEK® is based on the theory of linguistic gestalten by Zelger [81] and embedded in the software WinRelan® (Windows Relation Analysis). It fits to our inductive research approach because as individuals perceive their environment in terms of ordered gestalten, this process can be transferred to oral or written linguistic statements systematizing the unordered, but potentially significant knowledge. Thus, the concepts relevant to our study can be discovered by several analysis steps fulfilling syntactic, semantic and pragmatic rules which allow a transparent organization of contents. In contrast to other qualitative data analysis software for content analysis of text data (CAQDAS) [82], WinRelan® goes beyond the administration, coding and categorization of data; it integrates the methodical procedure as well as quantitative elements such as cluster analysis known from multivariate data analysis [83]. The advantage of GABEK® is grounded in its accuracy generated though a rule-based framework. It allows for the elaboration of individual problems as well as advancing to more abstract levels of analysis [84]. Figure 1 describes our research framework using GABEK®.

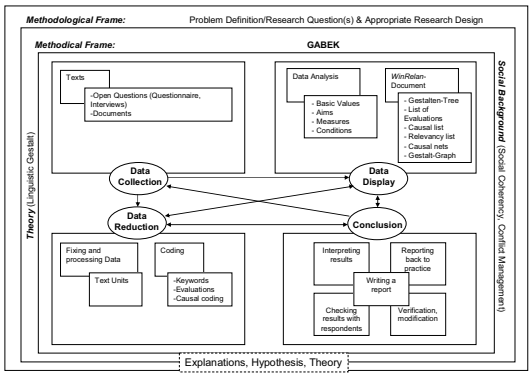

Figure 1. Research framework using GABEK® [84]

For data analysis, we transferred the transcripts of the interviews, the field notes of observations, and the texts of the documents into WinRelan® dividing it into 789 text units [for an overview of defining text units see 85]. The research team, consisting of two persons, took over the coding of the data individually. Therefore, the coders used established concepts derived from the literature [79], such as characteristics of a knowledge culture,

as well as inductively developed categories from the data [23] and inserted them into the file. In order to ensure inter-rater reliability and reduce individual coding biases, the meanings of the categories were continuously negotiated, checked with the primary texts, and synonyms were corrected. Thus, the relevant topics regarding the research questions were identified. The second step was the causal coding, which was conducted jointly by the research team. The cause and effect relationships in the data were identified and coded accordingly leading to causal nets [86]. These provide an understanding of influences of cultural issues and knowledge sharing processes, which is shown in our results.

5. Results: How culture influences cross-team knowledge sharing in an Austrian engineering company

The company under study with headquarters in Austria and Germany operates internationally and is positioned among the world's leading independent engineering consultants, particularly concerning tunneling, underground, and pipeline construction. The more than 1,300 employees are civil, mechanical, or electrical engineers. The work organization resembles a matrix structure [87] with functional departments and interdisciplinary project teams. This company was chosen because it is a knowledge-intensive company [88] depending highly on the knowledge that their employees gain in the conduction of different projects. In order to learn organization wide, this knowledge has to be shared. Due to previous knowledge management initiatives, the 15 interviewed employees (see Table 1) could reflect on different enabling and impeding factors for knowledge sharing.

Table 1. Characteristics of interviewees

Criteria	Interviewees
Male	13
Female	2
Project team member	11
Project team leader (assistance)	4
Project water engineering I	5
Project water engineering II	5
Project rail infrastructure	5

The interviewees reported that although the company has taken initiatives to foster knowledge sharing, such as mentoring systems, orientation for new employees, information and communication technologies, trainings, and constructive handling of mistakes, knowledge sharing between project teams is not intended. The interdisciplinary project teams should handle their tasks individually. Therefore, similar projects are carried out by the same project teams. Nevertheless, knowledge sharing between project teams is necessary and takes place. As exchange of experiences from other project teams makes the work for project team members easier, knowledge is shared across these formal boundaries.

Project team leaders exchange experiences primarily regarding the organization and administration of project teams. If new project teams are set up, project leaders also bring their experiences into the new teams. Project team members talk to colleagues from the same departments how they have dealt with similar problems in their project teams. Thus, knowledge sharing between project teams depends on the personal responsibility of the persons involved. This is enhanced by the conviction that to hoard knowledge is not respectable.

Regarding the question why knowledge sharing between project teams takes place and which factors are decisive, the interviewees revealed that knowledge sharing activities are influenced by cultural manifestations as well as cultural values, which are in turn influenced by the knowledge sharing behavior of the employees (as shown by the direction of the arrows in the causal nets in Figure 2 and Figure 3).

5.1. Cultural manifestations and their influence on knowledge sharing between teams

One enabling condition for knowledge sharing (as the green arrows show in Figure 2) is that the employees are now located in one building, which was newly built. Thus, employees from different project teams can communicate directly with each other, e.g. in coffee breaks. This is further enabled by a flat hierarchy and the leadership style in the company, which is very participatory, so that employees dare to contact each other, also across different hierarchy levels.

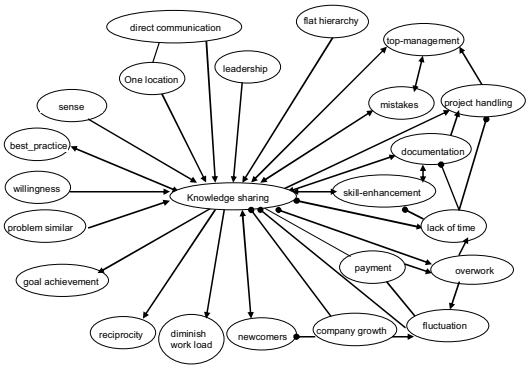

Figure 2: Manifestations influencing knowledge sharing

The top-management shows commitment to knowledge sharing, especially regarding trainings and mistakes. It is only usual to inform top-management if heavy mistakes have been committed. The reaction to mistakes is not to find someone to blame, but to find solutions. In the

company, mistakes are seen as a chance to learn; consequently, they are also communicated to other project teams.

In the handling of projects, top-management does not interfere because the leaders are convinced that self-managed project teams know best, how to pursue their work. Therefore, knowledge retrieval is conducted upon personal responsibility, e.g. by means of the implemented documentation system where previous project reports are stored. As the interviewees prefer direct communication, they also directly contact employees that are supposed to know about a certain problem. Mostly these contact persons are located within the same department and share similar problems.

As knowledge sharing involves persons, individual factors are decisive for these activities. Individuals need to see the sense in knowledge sharing processes; otherwise, they cease to engage in them. Thus, knowledge sharing activities also influence the attitudes of the persons involved. If employees have gained positive experiences with getting answers to their questions, diminishing their work load, and achieving their goals more easily, they are more likely and willing to engage in future knowledge sharing activities (reciprocity).

However, the lack of time negatively influences knowledge sharing (red arrows). Having no time means for the interviewees that they are not able to write the necessary reports for documentation, taking part in the skill enhancement program and handling their project tasks properly. Surprisingly, these are the activities that might save employees time in later project work. Nevertheless, the lack of time is caused by overwork within the projects, which diminishes possibilities for cross-boundary knowledge sharing activities.

Furthermore, a low payment does not motivate to engage in knowledge sharing because these processes are not explicitly wanted by top-management. The consequence of the low payment is a high fluctuation within the company, which is enhanced by the high company growth. Negative effects of these manifestations are that employees do not know each other personally and that a lot of newcomers do not know what is going on within the company, which hinders knowledge sharing activities.

5.2. Cultural values and their influence on knowledge sharing between teams

Regarding values needed for knowledge sharing between project teams (see Figure 3), the data showed that a sense of belonging and trust are decisive. The interviewees do not regard other employees (also not from other projects) as competitors but as colleagues. They trust all employees within the companies that their knowledge is not "stolen" in order to enhance others' competitiveness. Consequently, employees take the risk in engaging in knowledge sharing across team boundaries. As one interviewee stated: *"I think you have to start from scratch. Knowledge sharing between teams does not work top-down, but starts at the basis. If you provide confidence to your employees that they have their knowledge and can use ... apply their gathered knowledge, then I think it works".[If9, project leader]*

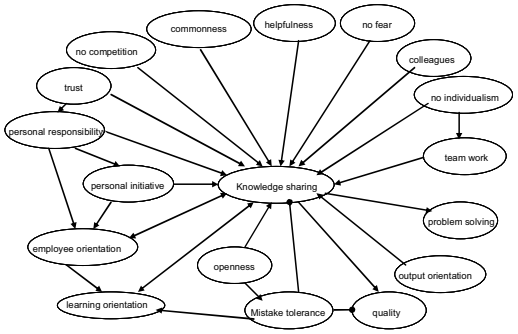

Figure 3: Values influencing knowledge sharing

Furthermore, the need for teamwork and the orientation towards problem solving is favorable for knowledge sharing processes. Interviewees stated that individualists do not have a chance to fulfill their tasks on their own. Rather, joint problem solving and knowledge sharing is done. Within the company it is appreciated to take personal responsibility if a mistake or problem occurs and search for a solution. Therefore, they contact colleagues from the same departments, who might have experienced the same. The aim is to conduct a project effectively reflecting the output orientation valued in the company. Therefore, it is less important who asks a question; everybody is given relevant knowledge.

Knowledge sharing between project teams requires openness and access to other employees. In the company, offices and nearly all areas within the database are open to all employees. Furthermore, making mistakes is allowed and if mistakes occur, they are seen as a chance to improve. This is reflected in the learning orientation within the company.

6. Discussion: A knowledge culture for cross-boundary knowledge sharing

The results show that there are certain manifestations and values that foster knowledge processes between project teams and thus can be regarded as characteristics of a knowledge culture favorable for cross-boundary knowledge sharing. Some characteristics have already been discovered in previous studies regarding favorable features for general knowledge management initiatives. The

contribution of this study is that now a holistic view of cultural elements could be derived especially for knowledge sharing between project teams. Furthermore, the direction of the arrows in the causal nets derived from GABEK® show that not only favorable/hindering concepts influence cross-boundary knowledge sharing, but are also changed by positive experiences with knowledge sharing processes.

The company under study resembles a matrix structure [87] with functional departments and interdisciplinary project teams. This structure and the interdisciplinary composition of project teams enhances the possibilities for cross-boundary knowledge sharing. Project team members contact colleagues from their departments in order to share experiences gathered in similar projects. Thus, we propose:

P1: *A matrix structure enables knowledge sharing across organizational boundaries.*

Top-Management can provide IT-Systems and install breaks and cafeterias in order to connect employees [66-68,70]. This infrastructure enables to foster relationships [31,89], find contact persons [90] and retrieve documents from the system [56,67,69,71,72]. As information flows are linked to work flows [27], the introduction of IT is especially important for cross-boundary knowledge sharing because often knowledge sharing partners do not work in the same departments or on the same projects. Thus, we propose:

P2: *Communication and interaction possibilities have a positive influence on knowledge sharing between project teams.*

Furthermore, leadership and commitment of top-management is decisive [63,69,72,73,75]. They serve as role models for knowledge sharing activities and provide resources as well as initiatives for knowledge management. Flat hierarchies enhance the possibilities to take personal responsibility. If top-management does not interfere into self-responsible cross-boundary knowledge sharing, employees might continue with these activities. Thus, we propose:

P3: *Shared leadership and personal responsibility of all employees have a positive influence on knowledge sharing between project teams.*

Time is the most important resource for knowledge sharing. As knowledge processes are mostly not an official part of the work, time for these activities is not planned [56]. Nevertheless, knowledge was shared in the company under study because employees felt the need to do this, experienced a decrease of work load if they used their colleagues' knowledge, and felt positive about the reciprocal behavior. These positive experiences shaped the values in the company towards a knowledge culture. Thus, we propose:

P4a: *The lack of time negatively influences knowledge sharing between project teams.*

P4b: *A need to share experiences because project work is facilitated, positively influences knowledge sharing between project teams.*

Unlike the previous research [56,58,63,66,72,73,91], this study revealed that incentive systems are not needed to establish a knowledge culture. Rather, individuals need to experience that it makes sense to engage in this kind of activities, which motivates them intrinsically. Thus, we propose:

P5: *Intrinsic motivation positively influences knowledge sharing between project teams.*

The most important value of a knowledge culture is trust [14,19,20,67,73]. This is also reflected in this study showing that trust is needed also for knowledge sharing across boundaries. As boundaries normally hinder the establishment of long-term and strong relationships, the organization-wide cultural value of trust facilitates knowledge sharing between members of different project teams. The detailed analysis of GABEK® shows that trust in top-management as well as trust in the individual responsibility of persons and project teams are decisive. Thus, we propose:

P6a: *Trust positively influences knowledge sharing between project teams.*

P6: *If top-management trusts their employees and project teams to act upon their own responsibility, knowledge sharing between project teams is encouraged.*

Team orientation is another feature of knowledge cultures [61,62,64,68]. This includes the conviction that tasks are so complex that employees can only cope with them jointly. Therefore, knowledge sharing between teams is needed in order to reach their aims. This is enhanced by collegiality and solidarity [90], which in this study resulted in less importance of friendship and sympathy for selection of partners in knowledge sharing activities. Thus, we propose:

P7a: *Team orientation and collegiality positively influences knowledge sharing between project teams.*

P7b: *If collegiality and solidarity are high, the influence of friendship and sympathy on knowledge sharing between project teams decreases.*

However, a high growth orientation is a barrier to knowledge sharing across organizational boundaries. If many new employees are hired, the employees do not know each other anymore. Therefore, the knowledge regarding who knows what (see also "transactive knowledge") [92] is limited. Thus, we propose:

P8: *Growth orientation has a negative impact on knowledge sharing between project teams.*

Employee orientation [64,65], e.g. by means of skill enhancement programs, and learning

orientation [66], which is reflected in tolerance regarding mistakes and focus on problem solving [63,64], have positive impacts on knowledge sharing between project teams. However unlike previous research, output orientation is a value favoring knowledge sharing between project teams. In the studied company customer satisfaction can only be achieved by employee satisfaction because the employees are the most valuable resource. Perhaps this is due to the fact that in engineering companies mostly skilled (knowledge) workers are employed, who need a high degree of autonomy and flexibility. Thus, we propose:

P9: *Output orientation, employee orientation and learning orientation have positive impacts on knowledge sharing between project teams.*

6. Implications and limitations

Based on the data analysis with GABEK®, new insights regarding the influence of cultural elements on knowledge sharing between project teams could be gained. Our results show that similar to existing research on individual knowledge sharing processes, information and communication technologies, enough time, trust, team orientation, employee orientation, and learning orientation have positive impacts on knowledge sharing between project teams. Also, some new insights could be gained. Especially for cross-boundary knowledge sharing a matrix structure, shared leadership and personal responsibility, intrinsic motivation, top-management's trust in employees and teams, collegiality, and output orientation are helpful, whereas a high growth orientation can be a barrier.

These results are especially helpful for managers in order to know which manifestations and values foster knowledge sharing across organizational boundaries. Furthermore, by means of causal nets we could show that these features influence each other giving managers a starting point to develop a knowledge culture: e.g., the provision of time reduces other negative effects, like the lack of documentation.

However, it is also in the responsibility of employees to shape their company's manifestations and values of their company's culture [51,52]. Although knowledge sharing is not officially demanded, the employees said that knowledge sharing is obligatory. It is not socially accepted to keep one's knowledge and newcomers soon feel the need to ask for knowledge in order to conduct their tasks. This is also valued by top-management because sharing best practices and avoiding mistakes has increased the quality, which increased customer satisfaction. Also, employee satisfaction increased by the experienced decrease of individual work load based on knowledge sharing. This moved learning orientation, customer and employee satisfaction into the focus of the corporate culture.

Limitations of the study are that only one company with a limited amount of employees could be studied at this level of detail. Further studies are needed to verify if the new relationships regarding cultural elements and knowledge sharing between project teams are valid for a broader variety of companies. The design of this inductive qualitative study limits the generalizability and may be subject to individual coding biases although several steps were taken to ensure inter-rater reliability. Furthermore, the company under study is an Austrian based company; as national cultures shape corporate cultures equivalent studies should be repeated in other countries, especially in order to find out if the deviant results regarding supportive and hindering cultural elements are based on national differences [33], or on the different focus of the study, namely knowledge sharing between project teams. Also, only the corporate level of culture was taken into consideration for this research. As there are many different subcultures [11] within companies, research discussing different levels of culture regarding knowledge processes are still missing.

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