THE CHALLENGES OF COLLABORATIVE KNOWLEDGE MANAGEMENT: WHY GRASSROOTS TECHNOLOGY NEEDS HELP FROM THE TOP

ADAM BERGENDAHL
MARTIN JENSEN

Master of Science Thesis
Stockholm, Sweden 2011
THE CHALLENGES OF COLLABORATIVE KNOWLEDGE MANAGEMENT: WHY GRASSROOTS TECHNOLOGY NEEDS HELP FROM THE TOP

Adam Bergendahl
Martin Jensen

Master of Science Thesis INDEK 2011:65
KTH Industrial Engineering and Management
Industrial Management
SE-100 44 STOCKHOLM
Abstract

This single case study explores the adoption of a wiki knowledge management system at a mid-sized IT retailer and consultancy. In exploring what factors affect how and if employees interact with the wiki six key areas are identified as crucial to enabling successful knowledge transfers with such a system:

1. Clearly linking the knowledge management to tangible business value
2. Clarifying for users the purpose and usage of the wiki
3. Aligning desired wiki use with the pre-existing corporate culture
4. Verifying that employee incentives are aligned with desired behavior
5. Making sure knowledge management is a part of existing processes
6. Effectively using technology to aid the users

Additionally the study includes a comparison with previously conducted studies on implementations of traditional non-collaborative knowledge management systems and finds a high degree of similarity with the issues that have previously been faced within the field. This thesis therefore argues that the new technology present in a wiki type system does not solve the pre-existing problems facing knowledge management practitioners. Instead, the same issues facing the implementation of any such system need to be resolved before the potential of a wiki knowledge management system can be realized.

Key-Words

Knowledge management, Corporate wiki, Web 2.0, Collaborative knowledge management, Knowledge sharing, Wiki, Collaborative software, Social software, KMS
# TABLE OF CONTENTS

Diagrams ................................................................................................................................. 7
Figures ................................................................................................................................. 7
Tables ................................................................................................................................. 7

1. Introduction ......................................................................................................................... 8
   1.1. Background .................................................................................................................. 8
   1.2. Contribution ............................................................................................................... 8
   1.3. Purpose and aim ......................................................................................................... 9
   1.4. Applicable fields of research .................................................................................... 9

2. Method .................................................................................................................................. 10
   2.1. Approach .................................................................................................................. 10
   2.2. Data Collection And Analysis .................................................................................. 12
      2.2.1. Participative Observations .................................................................................. 12
      2.2.2. Literature Study .................................................................................................. 12
      2.2.3. Survey ............................................................................................................... 12
      2.2.4. Qualitative Interviews ....................................................................................... 12
   2.3. Method Discussion ..................................................................................................... 13
      2.3.1. Delimitations ....................................................................................................... 13
      2.3.2. Implications ......................................................................................................... 13
      2.3.3. Literature study .................................................................................................. 14

3. Theoretical Framework .................................................................................................... 15
   3.1. Wiki Software ........................................................................................................... 15
   3.2. Reasons for Wiki Resistance .................................................................................... 16
   3.3. Possible Solutions To Resistance ............................................................................. 17
   3.4. Information Junkyards ............................................................................................. 18
   3.5. Knowledge Management and IT .............................................................................. 18
   3.6. Project Based Codification ....................................................................................... 19
   3.7. Data-Information-Knowledge ................................................................................... 22
   3.8. Knowledge ................................................................................................................ 23
   3.9. Knowledge Processes ............................................................................................... 23
   3.10. Incentives for knowledge sharing ............................................................................ 25
3.11. Extrinsic rewards

3.12. Cultural barriers

3.13. Knowledge Management Ecosystems

3.14. Knowledge management – Human resources

3.15. Taxonomy of knowledge management strategies

3.16. Issues among Knowledge management practitioners

3.17. Corporate web 2.0 technologies

4. Empirical Setting

4.1. Case study organization

4.2. Knowledge management systems at Technia

4.3. Conducted Survey Of Internal Communication At Technia

4.3.1. Selection of interviewees

5. Empirical Findings

5.1. Unclear link to business value

5.2. Purpose of the wiki

5.2.1. Purpose of wiki is not clearly communicated

5.2.2. Lack of guidelines and instructions

5.2.3. Several IT systems fill similar roles

5.2.4. Lack of top-management role models

5.3. Does not incorporate existing culture

5.3.1. Limited culture of formal cooperation

5.3.2. Reluctance to contribute

5.3.3. Sensitive information

5.4. Insufficient Incentives to share

5.5. Processes not adapted to the wiki

5.5.1. Sharing takes time which is a constrained resource

5.5.2. Some users prefer other communication channels

5.5.3. Critical mass of high quality information not yet reached

5.6. Low usability of the wiki

5.6.1. It is difficult to navigate and find information in the wiki

6. Discussion
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1. Knowledge management at Technia</td>
<td>52</td>
</tr>
<tr>
<td>6.1.1. Knowledge management strategy at Technia</td>
<td>52</td>
</tr>
<tr>
<td>6.1.2. Top management participation</td>
<td>53</td>
</tr>
<tr>
<td>6.2. Linking wiki to Business Value</td>
<td>54</td>
</tr>
<tr>
<td>6.2.1. Knowledge management linked to business value</td>
<td>54</td>
</tr>
<tr>
<td>6.3. Clarifying the Purpose and usage of the wiki</td>
<td>55</td>
</tr>
<tr>
<td>6.4. Incorporating existing culture</td>
<td>56</td>
</tr>
<tr>
<td>6.5. Incentives not aligned</td>
<td>57</td>
</tr>
<tr>
<td>6.6. Processes not adapted to KM and Wiki</td>
<td>57</td>
</tr>
<tr>
<td>6.7. Using technology to aid users</td>
<td>58</td>
</tr>
<tr>
<td>7. Conclusions</td>
<td>60</td>
</tr>
<tr>
<td>7.1. Criticism and suggestions for further research</td>
<td>62</td>
</tr>
<tr>
<td>7.2. Acknowledgements</td>
<td>62</td>
</tr>
<tr>
<td>8. Bibliography</td>
<td>63</td>
</tr>
<tr>
<td>9. Appendix I abbreviations</td>
<td>65</td>
</tr>
<tr>
<td>10. Appendix II Wiki screenshot</td>
<td>66</td>
</tr>
<tr>
<td>11. Appendix III Communication survey</td>
<td>67</td>
</tr>
<tr>
<td>12. Appendix IV Interview Guidelines</td>
<td>72</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

1.1. BACKGROUND
Knowledge management is today regarded as an important part of modern organizations. (Nonaka, 2007) When organizations become increasingly knowledge intense, the need for a structured method of preserving and propagating the competency within the organization becomes a priority. In order to survive, innovate and flourish, companies need to learn from their experiences and efficiently transfer knowledge between employees. One solution often proposed in response to the challenge of intra-organizational knowledge transfer is to implement a computer based Knowledge Management System (McDermott, 1999). Being based on rapidly developing technology, computer based knowledge management system are subject to change, as technological advancements enable new methods of knowledge sharing (McDermott, 1999). The technical development of new software has laid the ground for a new generation of knowledge management systems of a highly collaborative nature, such as wiki knowledge management systems. Indeed, so called Corporate Wikis, have become highly popular (Holtzblatt, Damianos, & Weiss, 2010).

However, despite the popularity of these systems, there is limited research focusing on their use in corporate environments (Holtzblatt, Damianos, & Weiss, 2010). Knowledge management systems do not function in isolation but rather require an environment that is conducive to knowledge transfer. A wiki is of little value if members of the organization it is set to serve don’t contribute information to the wiki. Given the popularity of wiki systems, it is of great interest to understand what factors affect sharing through wiki based knowledge management systems used within organizations.

Wiki technology is highly collaborative. Any user of a wiki knowledge management system can edit any article, including those originally written by others. Hyperlinks can be used to arrange articles in any structure or in no structure at all. Multiple structures can exist in parallel. Users are free to create new articles, name them in any way they like and optionally add links to them from other pages in order to incorporate them into existing structures. The power of a wiki system is indeed in the hands of its users. Since wiki technology is inherently bottom-up, it is interesting to study the tension and dynamics when it is used for traditionally top-down knowledge management.

1.2. CONTRIBUTION
The present study is a case study, focusing on a wiki that was implemented prior to the commencement of the study. With limited available research focusing on factors affecting knowledge sharing through wikis, exploratory case studies form an important step in laying the foundation for future research on the subject. Furthermore, as the border between study object and context is weak in the case of wiki knowledge management systems, the case study approach is appealing by allowing for studying the former while being highly aware of the latter.
The organization studied had chosen a grassroots approach to knowledge management, installing a wiki knowledge management system and to a great extent leaving it up to individual users to determine what subjects articles should be written about, how articles should be written and in what structure they should be ordered. The case study therefore provides insight into grassroots technology based knowledge management.

1.3. PURPOSE AND AIM

The purpose of this thesis is to contribute insight into what factors are required for an organization to be successful in implementing a wiki knowledge management system and turning the system into an effective and efficient knowledge management tool.

The aim of this study is to:

- Explore, map and deduce what factors affect the sharing of knowledge within organizations through wiki based knowledge management systems;
- Investigate and discuss how these factors vary due to differences of wikis in comparison to traditional knowledge management systems and in particular due to the bottom-up collaborative nature of wiki software.

The identified critical success factors will be discussed in relation to practical wiki adoption as will the implications of the comparison to existing literature. As the case study conducted focuses on a recently implemented wiki system, factors found to affect sharing of knowledge are likely to be of hygiene rather than motivational character.

1.4. APPLICABLE FIELDS OF RESEARCH

The theories on knowledge management by a wiki-system or corporate wikis arise from two different fields of research. The knowledge management literature is well established when it comes to traditional approaches that would be possible with paper-based tools and IT tools mimicking the usage by paper. Wiki software however creates thoroughly new possibilities of sharing knowledge not previously possible before the last 10 years. How users interact with a collaborative system of this type has however been previously studied by various researchers within the computer science and human-computer interaction fields. Lacking from more system-centric publications is often the organizational context necessary to put the system to use in an organization. This essay attempts to capture relevant insights from the computer science and human-computer interaction fields as well as from the knowledge management field.
2. METHOD

2.1. APPROACH
The research approach chosen is to conduct a single case study. The choice of method is motivated by the goals of the study, being of explorative nature and requiring extensive descriptions what factors affect the social behavior of knowledge sharing in an organizational context. The case study research approach is highly suited for answering the type of questions raised by the goals of the present study (Yin, 2009). The case study was conducted at the company Technia, a mid-sized IT consulting firm.

In conducting the study a semi-iterative approach was chosen to provide a connection between the theory and the empirical observations in accordance with Figure 1. The method was influenced by the grounded theory research method (Collis & Hussey, 2009) as the alternation of deductive and inductive hypothesis creation provided a structured framework by which to approach such a complex and subtle problem. This abductive approach was aided by the fact that the authors had no a priori knowledge of the knowledge management field and can be described as having entered the field with open minds. The method facilitates a valuation of the observations free from previous biases and assumptions. The authors do however have previous experience from wiki systems and computer science as well as management studies that could help interpret the results as well as identify possible applicable aspects within the knowledge management field useful to the study.
The first phase of the study was concerned with planning. During this phase of the workflow, a thesis proposal was written that outlines the steps envisioned in order to complete the study. Following this a pre-study was conducted beginning with participatory observations of the new employee training at Technia. During this phase an understanding of the company’s organization, business and industry as well as overall strategy was gained by the authors. An internal survey had recently been conducted at Technia when the study began. The responses to the survey were analyzed and used as input for the data-collection phase and especially the selection of interview subjects and issues to discuss with them.

When the interviews had been conducted the important topics discussed were written down from the recorded interviews. These were organized according to themes and prioritized subjectively according to what was emphasized by interviewees. The last stage consisted of the final writing off the thesis as well as a thesis defense.
2.2. DATA COLLECTION AND ANALYSIS

2.2.1. PARTICIPATIVE OBSERVATIONS
A significant part of the researchers’ time was devoted to participatory observations at the Kista Technia site during the spring of 2011. A lot of insight into the company was gleaned from various meetings in hallways as well as attending the new employee introduction and ‘Technia University’, a two-day summit to inform employees of new developments in the company. The participatory observations were conducted by taking notes when observing important insights into the company’s strategy, culture, attitudes and business. This enabled a deeper understanding of the company and what is important in the context of information sharing. The insights were used during all stages of the study, mostly as a method of evaluating and prioritizing the many opinions and facts that were gathered, but they also provided a background about what questions would result in meaningful answers during the interviews.

2.2.2. LITERATURE STUDY
One of the initial steps conducted was to begin reading up on the literature published in the area of knowledge management. As none of the researchers had any previous experience in the area, the initial studies were focused towards a computer science perspective gradually approaching the knowledge management field. Additionally both researchers participated in a course focusing on knowledge management at the Royal Institute of Technology (KTH) in order to get an overview of the most influential ideas and concepts within the field. The literature review continued during the entirety of the study and supplemented areas that were deemed lacking.

2.2.3. SURVEY
Prior to the start of the study a survey had been sent out by the head of communication at Technia. Although this survey was not tailored exclusively to this research project, a large number of the questions posed addressed issues relevant to the study. In an effort to increase the granularity of the survey it was cross-referenced with an employee database in order to provide increased detail about the individual respondents. The survey, which contained Likert scale-type questions as well as room for comments, provided a number of initial viewpoints that were taken into account. By aggregating the data when cross-referenced with employee database data it was possible to get data on attitudes subdivided by a number of parameters such as role and years worked at Technia. This was then used as input to get a varied selection of employees that reflected viewpoints both positive and negative to the wiki system.

2.2.4. QUALITATIVE INTERVIEWS
Eight different interviews were conducted. Out of these, three were interviews with people in management roles and five were interviews with employees who had no responsibility for making the wiki work except to use it. Employee interviewees were selected based on the survey previously carried out by the case study company, to represent both wiki users and non-users. The management interviewees were selected because they were in various ways responsible for the wiki.
All interviews followed a semi-structured approach, with a significant portion of the interview focused at matters not directly related to wiki usage, such as interviewees’ previous experiences and daily routines at work. The interviews were about one hour long and recorded. All interviewees except the management interviewees were informed that the results would be anonymous.

The interview recordings were coded in successive stages, to a small extent inspired by grounded theory (Collis & Hussey, 2009). Interviews were broken down into individual elements of information, which were labeled according to the issues discussed. The labeled information was then grouped and classified in a hierarchical structure. The structure was re-organized into a structure of conceptual character based on broad themes covering organizational, individual and technical issues. The themes generated were ‘grounded’ in the sense that they refer back to original empirical findings. The subjective choice of coding labels was made to reflect factors that were found during interviews to impede the wiki’s ability to function as an effective and efficient knowledge management system.

2.3. METHOD DISCUSSION

2.3.1. DELIMITATIONS

The study was a single-case study, focusing on only one organization. This could potentially limit the applicability of the findings of the study. Being an IT-firm, the level of computer literacy in the studied company was generally high. This limits the applicability of results somewhat. The company is also mid-sized and any conclusions would necessarily need to be adjusted if applied to larger or smaller firms. Being a geographically diverse company certain complexities in the knowledge management could potentially be culture-specific. These factors would warrant further investigation before any results are transferred to a general context.

2.3.2. IMPLICATIONS

Being a single case study, the validity of contributions made needs to be verified by further studies of other organizations. As the topic of the study may allow the results to be interpreted in different ways, it is important to note the organizational context in which the study was carried out. While statistical generalization is not possible from a single case study, it is feasible to suggest analytical generalizations to other, similar, organizational settings. In order to assure reliability of the study, all collected data was carefully maintained.

A few in-depth interviews were used for the collection of empirical findings in order to get deep understanding of the interviewees’ usage of and opinions about the wiki as a knowledge management tool. While the method is well suited to generate high quality qualitative data, using it comes with the risk of missing relevant factors. The grounded theory approach used is somewhat subjective. The authors chose labels and themes that were clearly related to the research question, a method that arguably reduced the subjectivity introduced by the grounded theory approach used.

The study was carried out during a relatively short time span. Hence, it reflects the wiki implementation process at the studied organization at a single point in time. As the implementation
of a wiki could be a relatively lengthy process, this fact needs to be considered when evaluating the findings of the study.

2.3.3. LITERATURE STUDY
As with any literature study there are without doubt areas of research that have not been thoroughly covered. The reviewed literature was to a large extent selected to answer and provide input to questions and issues that arose during the course of the study. Further the literature review attempted to cover the most influential issues within the field but can by no means be considered exhaustive.
3. THEORETICAL FRAMEWORK

3.1. WIKI SOFTWARE
Hasan and Pfaff (2006) outline in their work the three stages of frameworks that have evolved within the field of knowledge management. The first generation is based upon an ICT system providing timely input of information to decision makers and the second generation is based on the SECI model (see Figure 2) as well as the division between tacit and explicit knowledge. The current third generation however requires more complex adaptive models to create sense-making of collective knowledge creation. This allows a conceptual alternative to scientific management (Hasan & Pfaff, 2006).

Furthermore, Hasan and Pfaff (2006) describe the rough outline of what a wiki consists of as well as its properties. A wiki is a collective knowledge management repository named after the Hawaiian word for ‘quick’ or ‘fast’ in order to symbolize the fast paced possibilities of editing a document. The structure of a wiki is a set of interconnected HTML pages that can be accessed through a web browser and easily edited in the same way. Users are encouraged to add information to existing pages as well as create pages with entirely new subjects (Hasan & Pfaff, 2006). Hasan and Pfaff (2006) outline a number of advantages that a wiki structure can provide in knowledge management:

- Ideal collaboration environment (requires no technical skill to edit)
- Easy to customize (open structure makes it easy to adapt to the context)
- Promotion of organizational learning (a wiki is in sync with the concept of ‘organizational learning’)

Previous studies have been conducted on wiki implementations at other companies of a comparable size and type. One such study conducted by Chau & Maurer (2005) looked at an implementation of a corporate wiki called MASE. The philosophy behind this tool was the need for user to contribute through communication with peers as well as structured informational in a markup format. This communication was in the form of various plug-ins that provided the users with the possibility to work in a collaborative fashion by making the user aware of other users that were online as well as provide support for a virtual meeting environment. The company studied was a medium-sized software company providing knowledge management software. The study was conducted by a static analysis of logs documenting the user interaction with the system over a three month period (Chau & Maurer, 2005).

The study concluded that the wiki was used primarily for asynchronous communication with the collaborative features of the software used only sparingly. Furthermore, the study found that 80% of the information was in unstructured form and that of the top 10 contributors none were management staff. Most of the contributors were developers and some were technical writers. This created a self-organizing knowledge factory thereby avoiding an “ivory tower” syndrome that is sometimes attributed to centralized experience factory units. Furthermore, of the new pages created
during the time period only 15% were created and then never accessed again. Users also noted that this light-weight approach to knowledge sharing enabled them to easily contribute and the simple mark-up language of a wiki sped up the process (Chau & Maurer, 2005).

3.2. REASONS FOR WIKI RESISTANCE

The literature presents several aspects that cause resistance in an organization to the implementation of a wiki-based knowledge management system. One such case was identified and studied by Hasan & Pfaff (2006). The management in this case chose not to go forward and implement a wiki solution. Several obstacles were identified at an early stage such as: narrow bandwidth for knowledge conversion, acquisition latency, knowledge inaccuracy and a maintenance trap where increasing knowledge becomes increasingly difficult to maintain (Hasan & Pfaff, 2006).

However, several additional caveats were identified by the Hasan & Pfaff (2006). There was a resistance among management to let go of the important information advantage that management possesses and as a wiki tends to flatten the organization, proponents of a hierarchal model were not enthusiastic. Furthermore, other models of knowledge management have more control systems in the form of verification and version control. On a social level there was doubt about the potential for vandalism in a wiki where any collaborator could potentially deface a page. It was also difficult to distinguish fact from fiction in a wiki making information potentially unreliable. Lastly the lack of attribution for contributed work goes against the innate need of workers and any attempt to attribute credit could cause conflict among multiple contributors. Some legal concerns were also presented such as intellectual property (no owner) and libel liability where no individual contributor could be held responsible (Hasan & Pfaff, 2006).

A case study conducted at a large not for profit organization by Holtzblatt, Damianos & Weiss (2010) revealed several factors impeding wiki users’ willingness to share information and knowledge through the wiki. These factors include that; there may be a cost associated with adding information to a wiki, information may be secret, users may not want to share unfinished work and that users don’t want to share sub-par work with their colleagues. Further, it was shown by Holtzblatt, Damianos & Weiss (2010) that established work practices and tools had a significant role and that people’s general unwillingness to spend time learning a new tool that they did not come across “naturally” in their daily work impeded wiki usage. The lack of guidelines and standards for how the wiki should be used was a further obstacle for full potential wiki utilization. Finally, the case study indicated that there was a culture of sensitivity working against the collaborative nature of the wiki. People did not want others to edit content that they regarded as belonging to them and they were keen to avoid editing content they regarded as belonging to someone else (Holtzblatt, Damianos, & Weiss, 2010).

Further study into the subject of organizational resistance to sharing in online repositories was conducted by Wasco and Faraj (2000). Wasco and Faraj (2000) describe the three dominating views within the knowledge management community as knowledge as an object, embedded in people or maintained within a community. When knowledge is a private good it is described along dimensions such as tacit-explicit, universal-local, declarative-procedural or sticky-fluid. Furthermore, it can be
appropriated and exchanged as a commodity between organizations. The second approach that regards knowledge as embedded in people challenges the disembodied view of knowledge. It is still however a private good and exchanged via human interaction (Wasko & Faraj, 2000).

The third view is the slightly more unconventional view that knowledge is something maintained within a community (Wasko & Faraj, 2000). This knowledge is a public good that all persons may use without consuming it. The public knowledge at the same time can only be maintained if it is continually provisioned by its members. Although the first two are the alternatives most pursued by corporations, the authors suggest that this third view could often be advantageous. This perspective defines the knowledge as “the social practice of knowing” thereby emphasizing the community aspect of knowledge. The other two views place knowledge as the property of the organization or the individual knowledge is exchanged through market mechanisms such as incentives provided to the individual, be they status or pay incentives. The authors argue that this theory does not apply to the community owned knowledge where that rational decision is to free-ride and only consume without contributing. Yet recent research suggests that people contribute in an altruistic manner as well as work harder when they are motivated by a moral obligation (Wasko & Faraj, 2000).

During their investigation, Wasko and Faraj (2000) studied a number of newsgroup chat rooms and sent out a survey in order to determine what motivated the people to contribute. Wasko & Faraj (2000) then performed a content analysis on the responses in an attempt to gauge the level of participation and the reasons for it. They subdivided the reasons for sharing into tangible and intangible and found that although a portion of all respondents participated for tangible returns, a substantial portion did it for a sense of contributing to a community and other intangible benefits (Wasko & Faraj, 2000).

3.3. POSSIBLE SOLUTIONS TO RESISTANCE
Some of the presented solutions to the discussed problems are based on literature inspired by Wikipedia. One such answer was presented by Hasan & Pfaff (2006) were they attempt to counter argue against the identified obstacles. They maintain that the decentralization of IS control needs to be a step-by-step process where qualified colleagues will verify the veracity of the information. By assuming that management hires competent employees, any inaccuracy is assumed to be identified and corrected. As for vandalism the authors highlighted that work-related matters are often not very emotive thereby reducing the risk of vandalism. Revision control and revealing the identity of collaborators would further reduce the risk of malice. To counter the argument that wikis will have a low degree of participation due to not attributing authorship they present an assertion that group cooperation is driven by interdependence. The wiki contains such an interdependence mechanism. Corporate incentives also need to be given to motivate employees to be fully motivated to contribute. The legal aspects are seen as an opportunity. By foregoing the standardized processes for intellectual property present in the company greater opportunities for innovation arise (Hasan & Pfaff, 2006).
3.4. INFORMATION JUNKYARDS

A potential pitfall in the development of knowledge management system is the danger of ‘information junkyards’ as highlighted by McDermott (1999). He illustrated the example of how information systems alone cannot create healthy knowledge management at a consumer products company that had implemented an IT system for the documentation of work processes. The staff hated the task of documenting procedures that in their view were too complex and diverse to be captured in a database. After much prodding by senior managers the database was however populated yet little used. Most people found it to be too general and generic to be useful. In the end the company had an expensive and useless information junkyard that served no purpose. According to McDermott (1999) the fault in this case was creating an information system without an understanding of what the professionals needed as well as in what form and level of detail (McDermott, 1999).

3.5. KNOWLEDGE MANAGEMENT AND IT

McDermott (1999) further elaborated on the differences between information systems and working knowledge management. According to McDermott (1999) the view of knowledge management experts needs to be lifted from the purely technical aspects to the people involved. He illustrates this by highlighting four key challenges that organizations need to tackle to successfully implement a community based knowledge management system: the technical challenge, the social challenge, the management challenge and the personal challenge.

Knowledge management has always been an important part of many fields, such as master craftsmen training apprentices. However it was first in the 1990’s that it evolved into a conscious practice. As the focus of industrialized countries shifted from natural resources to intellectual capital, executives were compelled to investigate the foundation of their business. At the same time networked computers arose, enabling this information to be stated explicitly and shared easily. Leading the charge were consulting firms where the main assets rested firmly in the mind of the employees (Hansen, Nohria, & Tierney, 1999).

The knowledge management practices of the consulting firms can be divided into two main categories. The first is the codification strategy that focuses on stating the knowledge in an explicit manner and to store it in databases where it can be reached by other employees. The second is the personalization strategy where knowledge is mainly communicated between individuals. The computer fills the roll of facilitating this contact (Hansen, Nohria, & Tierney, 1999).

Companies that follow a codification strategy generally invest to a high degree in IT infrastructure. The goal is to rely on the “economics of reuse” by offering lower prices and faster delivery. Documents or code are written down and made searchable in a central repository where others can access them and reuse the work. However, the knowledge does not function as prepackaged products but rather as Lego bricks which the users are required to assemble while adding their own skill (Hansen, Nohria, & Tierney, 1999).
3.6. PROJECT BASED CODIFICATION
Codification is inherently a static process due to the very nature of recording and storing knowledge. This does not however necessitate that the process in and of itself is not a process of learning and adaptation. Prencipe & Tell (2001) studied this aspect in project based organizations where the ideal result was to capitalize and transfer the knowledge gained in one project to other projects within the organization. Companies attempting to capitalize on knowledge gained from projects also face some unique challenges in that individual projects are unique and temporary. Companies face the challenge of learning “from a sample of one”. It can be argued that many projects are more a unique constellation of individuals than anything else. Within an organization that consists of a large number of projects the company can be regarded as a population of projects where individual projects compete for resources and time. The goal of knowledge management in this case would be to introduce a genetic component to the projects to enable knowledge learned to propagate (Prencipe & Tell, 2001).

Prencipe & Tell (2001) argue that previous codification literature focuses to a too high degree on the outcomes of the codification approach rather than looking at the process itself. They speculate that in the argument between codification and the reliance on tacit knowledge the knower has been forgotten from the process. The knower is someone within the organization that draws knowledge from several sources thereby rendering any rigid description of the knowledge processes too narrow. They further subdivide codification into the three phases experience accumulation, knowledge articulation and knowledge codification. Experience accumulation is a natural part of a company’s capability development. As routines are perfected they are gathered by the practitioner. There is however no need to have them formalized and conceptualized as each person only has a need to know how to do their own job. Knowledge articulation is the cognitive dimension of learning while performing a task by reflective thinking. The function of knowledge articulation is that it constitutes a context for the justification of knowledge as well as enables knowledge to be communicated and shared. Finally knowledge codification is a natural extension of the articulation requiring some further thought and structure. One could say it is the phase of sense-making that renders tacit knowledge explicit (Prencipe & Tell, 2001).

Based upon the three stages of organizational learning Prencipe & Tell (2001) identified several different learning landscapes based upon the behavior of a number of studied organizations. Along one axis are the different phases and along the other the different levels along which they are functional (see Table 1 Learning Landscapes). The bullet points list examples of activities within each cell. The landscapes are the L-shaped (blue), T-shaped (red) and stairway (green).

The L-shaped landscape or explorer is mainly concerned with people-to-people learning. Prencipe & Tell (2001) found this learning landscape mostly in smaller organizations characterized by informal communication where processes and procedures were regarded as hampering the development of new ideas at the early stages of innovation and personal relationships were paramount. The second landscape, the T-shaped or navigator has a higher focus on the articulation of lesson learned with regular meetings for expressing how a project was conducted. The authors found a risk of meeting
overload but otherwise a functioning knowledge exchange. The codification practices of the navigator companies were however somewhat limited as shown by an intranet that only contained some limited knowledge. No particular incentives were implemented to facilitate knowledge sharing. Project leaders were evaluated mainly on the project performance and not knowledge re-used from previous projects that had been documented. Lastly the authors identified a learning landscape dubbed the exploiter or staircase landscape. The cases classified as exploiter had a more developed ICT infrastructure where lessons learned from each project. One of the studied companies had generic processes for project phases in order to facilitate reuse. Although the companies had a mature IT environment they focused on person-to-person communication for knowledge accumulation thereby balancing the codification with innovation. (Prencipe & Tell, 2001)
<table>
<thead>
<tr>
<th>Level of analysis</th>
<th>Experience accumulation</th>
<th>Knowledge articulation</th>
<th>Knowledge codification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>On-the-job training</td>
<td>Figurative thinking</td>
<td>Diary</td>
</tr>
<tr>
<td></td>
<td>Job rotation</td>
<td>“Thinking aloud”</td>
<td>Reporting system</td>
</tr>
<tr>
<td></td>
<td>Specialisation</td>
<td></td>
<td>Individual systems design</td>
</tr>
<tr>
<td></td>
<td>Re-use of experts</td>
<td>Scribbling notes</td>
<td></td>
</tr>
<tr>
<td>Group/Project</td>
<td>Developed groupthink</td>
<td>Brainstorming sessions</td>
<td>Project plan/audit</td>
</tr>
<tr>
<td></td>
<td>Person-to-person</td>
<td>Formal project</td>
<td>Milestones/deadlines</td>
</tr>
<tr>
<td></td>
<td>communication</td>
<td>reviews</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Informal encounters</td>
<td>De-briefing meetings</td>
<td>Meeting minutes</td>
</tr>
<tr>
<td></td>
<td>Imitation</td>
<td>Ad-hoc meetings</td>
<td>Case writing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lessons learnt and/or</td>
<td>Project history files</td>
</tr>
<tr>
<td></td>
<td></td>
<td>post-mortem</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>meetings</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intra-project</td>
<td>Intra-project</td>
</tr>
<tr>
<td></td>
<td></td>
<td>correspondence</td>
<td>lessons learnt</td>
</tr>
<tr>
<td>Organisational</td>
<td>Informal organisational</td>
<td>Project manager</td>
<td>Drawings</td>
</tr>
<tr>
<td></td>
<td>routines, rules</td>
<td>camps</td>
<td>Process maps</td>
</tr>
<tr>
<td></td>
<td>and selection</td>
<td>Knowledge</td>
<td>Project management</td>
</tr>
<tr>
<td></td>
<td>processes</td>
<td>retreats</td>
<td>process</td>
</tr>
<tr>
<td></td>
<td>Departmentalisation</td>
<td>Professional</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and specialisation</td>
<td>networks</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Knowledge</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>facilitators and</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>managers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inter-project</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>correspondence</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inter-project</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>meetings</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 1 LEARNING LANDSCAPES (PRECIPE & TELL, 2001)
3.7. DATA-INFORMATION-KNOWLEDGE

Alavi & Leidner (2001) question the traditional definitions from the computer science fields regarding the roles played by different hierarchies of information. The traditional view is that data is the lowest class and generally exists only in the form of facts or raw data. When the data is processed it becomes information. Verified and authenticated information is regarded as knowledge. The authors question this view and put forward the argument that knowledge exists in the minds of people and is a prerequisite for any of the other classes to exist. Raw unprocessed data does not exist as even the process of selecting and gathering data requires thought with a specific goal in view. Therefore structured and processed data, information, can create new knowledge only when absorbed by an individual. An implication of this is that a knowledge management system will not be radically different from any other information system as its main purpose is to structure and help users assign meaning to information (Alavi & Leidner, 2001).

The term ‘knowledge’ also has a large amount of different definitions according to the literature. If knowledge only exists in the minds of individuals the hoards of information serve no particular purpose but are only of value when accessed and assimilated by individuals (Alavi & Leidner, 2001). However, if knowledge is regarded as an object then it can be stored and gathered in warehouses such as IT systems (Alavi & Leidner, 2001). Alavi and Leidner (2001) present the taxonomy of knowledge presented in Table 2 where the different potential definitions of knowledge are presented along with what implications they would have for knowledge management.
### TABLE 2: KNOWLEDGE DEFINITIONS (ALAVI & LEIDNER, 2001)

<table>
<thead>
<tr>
<th>Perspectives</th>
<th>Implications for Knowledge Management (KM)</th>
<th>Implications for Knowledge Management Systems (KMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge vis-à-vis data and information</td>
<td>Data is facts, raw numbers. Information is processed/interpreted data. Knowledge is personalized information.</td>
<td>KM focuses on exposing individuals to potentially useful information and facilitating assimilation of information.</td>
</tr>
<tr>
<td>State of mind</td>
<td>Knowledge is the state of knowing and understanding.</td>
<td>KM involves enhancing individual’s learning and understanding through provision of information.</td>
</tr>
<tr>
<td>Object</td>
<td>Knowledge is an object to be stored and manipulated.</td>
<td>Key KM issue is building and managing knowledge stocks.</td>
</tr>
<tr>
<td>Process</td>
<td>Knowledge is a process of applying expertise.</td>
<td>KM focus is on knowledge flows and the process of creation, sharing, and distributing knowledge.</td>
</tr>
<tr>
<td>Access to information</td>
<td>Knowledge is a condition of access to information.</td>
<td>KM focus is organized access to and retrieval of content.</td>
</tr>
<tr>
<td>Capability</td>
<td>Knowledge is the potential to influence action.</td>
<td>KM is about building core competencies and understanding strategic know-how.</td>
</tr>
</tbody>
</table>

### 3.8. KNOWLEDGE

Different types of knowledge can also be subdivided along different variables in order to be properly classified. One of the more famous classifications is along the tacit vs. explicit delimitation. Here Alavi & Leidner (2001) see that a lot of the existing literature in some way classifies the tacit knowledge as worth more than the explicit knowledge. This gives rise to the uncomfortable conclusion that the inability to record knowledge makes it more worth. Rather they see the two groups as continually interacting whereby tacit knowledge creates explicit knowledge and vice-versa. The authors also outline an additional framework for knowledge classification that is much more specific than the tacit-explicit classification that has been widely cited. (Alavi & Leidner, 2001) The authors further expand upon the subject of knowledge transfer noting that it is an important factor in knowledge management. The picture quickly becomes very complex when discussing the transfers of knowledge from many different knowledge types (Alavi & Leidner, 2001).

### 3.9. KNOWLEDGE PROCESSES

One of the formative frameworks within knowledge management is the SECI model based upon the work of Nonaka (2007). In his work Nonaka outlines the four main types of learning that exist in an organization. This concept is based upon the concept that knowledge can be of two different types:
tacit and explicit. There are therefore four different types of knowledge transfer that can occur; tacit to tacit, tacit to explicit, explicit to explicit and explicit to tacit. These four different types of learning are given the names: socialization, externalization, combination and internalization according to Figure 2 SECI model (Nonaka, 2007).

*Socialization* refers to the tacit-tacit process whereby people work together and thereby exchange knowledge. An example of this sort of learning might be an apprenticeship situation whereby knowledge is transferred from one person to another by actually performing the task together. This knowledge can then be *externalized* in order to transition from tacit to explicit knowledge. This occurs by writing down or in another way formalizing tacit knowledge so that it can in some way be transferred more easily. An example might be for someone to write down the work processes that they have developed an intuitive understanding of through many years on the job. The explicit-explicit transition is named *combination* and is the process of taking knowledge from already codified explicit sources and combining them into something new. This might for example be a controller combining the data from several financial sources into one single financial report thereby creating something new although all the knowledge already existed within the company. Finally the transition explicit-tacit named *internalization* refers to the process of taking codified knowledge and through practice to develop an intuitive understanding of it (Nonaka, 2007).

These processes are ideally repeated in a cycle with each new step building upon the previous experiences in order to constantly evolve and build the knowledge within the company. Figure 2 SECI model illustrates the iterative nature that is desirable in a knowledge-creating company (Nonaka, 2007).
3.10. INCENTIVES FOR KNOWLEDGE SHARING

An issue always closely tied to that of knowledge management is how to engage employees in the desired behavior of sharing knowledge. These types of programs promoting and rewarding the most skilled in getting them to act in an expert role have been around for a long time. Bartol & Srivastava (2002) discuss these issues, subdividing the knowledge sharing processes into several different processes each requiring to be treated in a different manner. Differences also exist as to when it is applicable with monetary as opposed to other incentives to promote knowledge sharing within the organization (Bartol & Srivastava, 2002).

Bartol & Srivastava (2002) begin their study by adopting a previous taxonomy of knowledge management systems and from it they identify four main sharing processes that exist within the organization. First is contribution to organizational databases; second, sharing in formal processes within teams or work units; third, the sharing of knowledge in informal interactions within the company and the final process being knowledge sharing within voluntary communities of practice (Bartol & Srivastava, 2002).

When considering the rewards that the authors study they recognize that rewards can be intrinsic (the rewards being the joy of performing a task) as well as extrinsic. The extrinsic rewards can be monetary as well as non-monetary as in recognition of peers. The authors limit the scope of the article to only the monetary rewards. There also exists some controversy between the interactions of intrinsic and extrinsic rewards. The argument goes that by providing monetary incentives the intrinsic rewards are externalized and therefore diminished. The counterargument, however, states that providing extrinsic rewards signals the organization’s appreciation of the competency provided thereby further strengthening the intrinsic rewards. The authors take no clear sides in the debate but contend that the field is muddled (Bartol & Srivastava, 2002).

Bartol & Srivastava (2002) further discuss the issue of knowledge transfers when contributing to databases. They find that within the personalization-codification spectrum this type of transfer sits firmly at the codification end. They further point to a number of anecdotal evidence that companies have linked this type of knowledge sharing to performance pay. For example employees at Capgemini are evaluated on a scale from 2 to 5 with 5 being the best. Employees not contributing to knowledge sharing activities cannot score more than a 3 in the evaluations. Although there is no formal evidence of the efficacy of these incentives the authors argue that these types of transfers are especially suitable for performance based rewards and that this process is towards the economic end of the spectrum of interactions between employer and employee. There exists however a metering problem with regards to this type of compensation. At both Capgemini and Ernst & Young employee knowledge contribution to the database is measured in regards to how widely that information is used (Bartol & Srivastava, 2002).

The fourth process, of communities of practice, is also discussed. Due to previous research within the area the authors conclude that participants in communities of practice are not driven by monetary gains. They therefore suggest that alternative approaches would be required to target these groups and suggest further research is needed. (Bartol & Srivastava, 2002)
3.11. EXTRINSIC REWARDS
The view that extrinsic rewards can be a motivator is however contradicted by a study conducted by Bock, Zmud, & Lee (2005). In their study they conducted a large scale survey mapping respondents’ attitudes to knowledge sharing to a number of factors. The study found a negative relationship between the expected extrinsic rewards and the sense of self-worth towards knowledge sharing. Worth noting is however that it was found that the greater the anticipated reciprocal relationships were, the more positive the subjects’ attitudes to knowledge sharing were. Based on their findings the authors came to the conclusion that nurtured social relationships are a prerequisite for functioning knowledge sharing. Secondly they recommended fostering active communities within the workforce as well as providing appropriate feedback to employees engaged in knowledge sharing. A knowledge management policy stressing extrinsic rewards as primary motivator was not sufficient (Bock, Zmud, & Lee, 2005).

3.12. CULTURAL BARRIERS
Participation in a knowledge management system is also a highly cultural phenomenon. McDermott & O’Dell (2001) conducted a study attempting to root out the cultural aspects of knowledge sharing as well as provide guidance for practitioners within the field. Following Shein (1990) they defined organizational culture as a composite of three levels (McDermott & O’Dell, 2001). The most visible being the artifacts such as espoused values and mission statements as well as policies and stated beliefs. On a deeper level organizations have a number of core assumptions underlying the actions of the employees. Acting outside of these core assumptions is often unthinkable and they can be the reason for acting contrary to stated missions and values (Schein, 1990).

McDermott & O’Dell (2001) found a number of key factors needed to succeed with the high-level cultural aspects based on the best practices of the studied companies:

1. *Not properly linking knowledge sharing to the solving of practical business problem* was found to be the single most decisive factor for failure of knowledge sharing projects. The best-practice companies could easily describe how knowledge sharing was linked to business results. They found three main ways of tying the knowledge sharing to the business; making knowledge directly a part of the business strategy, piggybacking sharing knowledge to another key business initiative and sharing knowledge as a standard way of working. Each of these are however able to visibly tie business value to knowledge sharing.

2. *Matching the knowledge management to the style of the organization* was another key factor. As an example the authors mentioned Lotus where the companies live in an electronic world and it was natural to build an electronic system for sharing.

3. *Aligning reward and recognition to support sharing knowledge*. Although none of the best-practice companies believed that this was a silver bullet it however highlights the companies and managements prioritization of knowledge management as an important success factor. (McDermott & O’Dell, 2001)
McDermott & O’Dell (2001) also observed a number of invisible values of the studied companies reflecting the core assumptions that underlies the organizational culture. Based on these finding they suggested a number of ways of building on the preexisting conditions:

1. **Build on a core value of the organization** meant that none of the interviewees described their knowledge management practices as taking the company in a new direction; rather they described the knowledge sharing within terminology that already was well embedded within the company. For example the knowledge sharing at Ford was described as a way of ‘avoiding mistakes’ a value already well cemented in the culture.

2. **Build on existing networks.** The most successful companies were able to leverage the existing networks in order to yield results. At Lotus an already informal company where networks were formed on an ad-hoc basis. This involved letting the groups form and eventually legitimizing moderators to support. At other places this involved engaging already existing social groups used to share knowledge and lightly authorize them by giving them a budget (McDermott & O’Dell, 2001).

Further McDermott & O’Dell (2001) found that at the best organizations not sharing knowledge had serious career as well as personal consequences. Being seen as a ‘knowledge hoarder’ would get you assigned to training seminars and limit promotions. Further asking questions without first consulting the database would result in ‘flaming’ by peers. In summary the key the authors found for tackling the cultural aspects of knowledge sharing was more to adapt the knowledge sharing practiced to the corporate culture rather than the other way around (McDermott & O’Dell, 2001).

### 3.13. KNOWLEDGE MANAGEMENT ECOSYSTEMS

An article by Burkharda, Hilla, & Venkatsubramanyana (2011) covers how modern knowledge management is used in a high-tech Silicon Valley company. This is done through a case study at a company active within the semi-conductor business that paradoxically suffers from knowledge management related shortcomings. They state that as KMS are becoming ever more complex with a high degree of participation with omnidirectional information flows the companies need to act more as stewards of knowledge. This cooperation often involves open and frank information sharing with customers (Burkharda, Hilla, & Venkatsubramanyana, 2011).

The study by Burkharda, Hilla, & Venkatsubramanyana (2011) was of a case format detailing the growth and development of ecologies of knowledge management mostly within the area of customer satisfaction which was the main priority of Z-Chip as the company was called. The handling of the tech-documents (of which there were many) were also severely lacking with many unreadable and the people who wrote them missing from the company. Furthermore, an ecosystem of information about the company’s products had developed on various forums around the web. These issues also concerned the management due to the possibility of lacking quality of information when Z-Chip was not the only source of authoritative information. The authors identified a number of information flows that had developed within as well as outside of the company (Burkharda, Hilla, & Venkatsubramanyana, 2011).
From the study Burkharda, Hilla, & Venkatsubramanyana (2011) drew a number of conclusions that can be applied to the knowledge management needs of other company’s within the high-tech industry. First of all, the traditional approaches to KM were seen to be increasingly challenged by the complex and rapidly changing knowledge landscape with communities of practice extending to the customer base. Secondly, the social nature of the web creates new and often autonomous information linkages that extend beyond the core firm. Third, the new role of the company suggests the firm as a manager of a meta-community-of-practice for the knowledge ecosystem in which the firm is situated. Finally the authors suggest that the current theories for knowledge management do not adequately explain and deal with situation, that modern companies are situated in (Burkharda, Hilla, & Venkatsubramanyana, 2011).

3.14. KNOWLEDGE MANAGEMENT – HUMAN RESOURCES

Although the knowledge management field often has had a technology focus the knowledge sharing is conducted by people, a fact which is often overlooked according to Yahya & Goh (2002). They argue that the focus of KM should reside with the people involved. They reason that KM is intimately tied to the HR practices of companies and that the HRM influences the KM practices. They argue that KM is actually an evolved form of human resource management (Yahya & Goh, 2002).

The study conducted by Yahya & Goh (2002) mapped the results of a number of surveys to find what practices and factors mark an effective knowledge company with regards to its HR practices. They found that the HR needs demanded to develop effective knowledge sharing differ from the traditional views. They stress a focus on internal training focusing on; leadership skills, creativity, problem solving skills and quality initiatives (Yahya & Goh, 2002).

Yahya & Goh (2002) further look at the performance and appraisal system required to promote desired employee behavior. Although their results suggest an appraisal system based on the knowledge sharing of the employee in order to reward or punish, they also stress the importance of forgiveness in the appraisal system. The leeway for reasonable failures is to promote an actionable culture influenced by a ‘knowing comes from doing’ culture (Yahya & Goh, 2002).

Finally Yahya & Goh (2002) study the pay and incentive structures required in promoting knowledge sharing behaviors:

- “reward risk tasking attitude in order to promote creativity in solving daily problems; and
- stress on group-based compensation and reward to simulate knowledge exchange and sharing within group members.”

Yahya and Goh (2002) further found that companies tend to give out rewards based on the individual’s contribution to the group’s performance, the individuals knowledge sharing and innovative work approach.
3.15. TAXONOMY OF KNOWLEDGE MANAGEMENT STRATEGIES

Earl (2001) created through interviews with active knowledge management practitioners a taxonomy that attempts to classify the different perceived types of knowledge management observed in the field (see Table 3). The goal of this exercise was to help CIOs and CKOs to take the step from reading the literature within the field to getting an actionable help in the form of a taxonomy that would help answer the question ‘what to do next Monday’ (Earl, 2001).

The first category on the taxonomy in Table 3 KM Strategy Taxonomy is the technocratic perspective. Within this section the system school is the most established focusing on establishing information systems for the codification of knowledge in order to permit access to a number of expert individuals. The second category is the cartographic school. This is the ‘yellow pages’ approach to knowledge management. An example within this category is Bain & Co, a management consultancy. The strategy is to effectively map who knows what. The final school within the technocratic approach is the engineering school, conceptually an offshoot from the business process reengineering practices. Companies with a KM strategy focusing on the engineering school have information systems providing employees with relevant information when needed in the business processes. The information needed to better perform a certain task is within this school delivered in a context sensitive way when needed by the employee, e.g. sales and marketing tactics when the employee is in a sales process (Earl, 2001).

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>TECHNOCRATIC</th>
<th>CARTOGRAPHIC</th>
<th>ENGINEERING</th>
<th>ECONOMIC</th>
<th>ORGANIZATIONAL</th>
<th>SPATIAL</th>
<th>STRATEGIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOCUS</td>
<td>Technology</td>
<td>Maps</td>
<td>Processes</td>
<td>Income</td>
<td>Network</td>
<td>Space</td>
<td>Mindset</td>
</tr>
<tr>
<td>AIM</td>
<td>Knowledge Bases</td>
<td>Knowledge Directories</td>
<td>Knowledge Flows</td>
<td>Knowledge Assets</td>
<td>Knowledge Pooling</td>
<td>Knowledge Exchange</td>
<td>Knowledge Capabilities</td>
</tr>
<tr>
<td>UNIT</td>
<td>Domain</td>
<td>Enterprise</td>
<td>Activity</td>
<td>Know-how</td>
<td>Communities</td>
<td>Place</td>
<td>Business</td>
</tr>
<tr>
<td>EXAMPLE</td>
<td>Xerox</td>
<td>Shonk Films</td>
<td>Bain &amp; Co</td>
<td>HP Frito-Lay</td>
<td>Dow Chemical</td>
<td>IBM</td>
<td>BP Amoco</td>
</tr>
<tr>
<td>CRITICAL SUCCESS FACTORS</td>
<td>Content Validation</td>
<td>Incentives to Provide Content</td>
<td>Cultural Incentives to Share Knowledge</td>
<td>Knowledge Learning and Information Unrestricted Distribution</td>
<td>Specialist Teams</td>
<td>Instrumentalized Process</td>
<td>Sophisticated Culture</td>
</tr>
<tr>
<td>PRINCIPAL IT CONTRIBUTION</td>
<td>Knowledge-based Systems</td>
<td>Profiles and Directories on Intranets</td>
<td>Shared Databases</td>
<td>Intellectual Asset Register and Processing System</td>
<td>Intellectual Asset Register and Processing System</td>
<td>Intellectual Asset Register and Processing System</td>
<td>Eclectic</td>
</tr>
<tr>
<td>PHILOSOPHY</td>
<td>Codification</td>
<td>Connectivity</td>
<td>Capability</td>
<td>Commercialization</td>
<td>Collaboration</td>
<td>Contactivity</td>
<td>Consciousness</td>
</tr>
</tbody>
</table>
The economic-commercial school is according to Earl (2001) less concerned with exploration and more with delivering results from existing results. This could involve the handling of intellectual property in order to gain maximum returns. The philosophy of this school is the pure commercialization of intellectual capital possessed by the organization (Earl, 2001).

Within the behavioral category the organizational school is concerned with organizational structures to share or pool knowledge. This is often defined by the organization of communities of likeminded individuals in a fashion similar to communities of practice. This behavior can often be supported by technology but focuses more on the knowledge transfer within groups. The next school is the spatial school of knowledge management. Using terms such as water-cooler meeting spaces and ‘knowledge cafes’ the organization attempts to foster an environment of knowledge exchange by facilitating meetings between individuals within the office. Lastly, the strategic school places knowledge management strategy at the core of the entire company’s strategy. This is when the firm sees knowledge as its core competency (Earl, 2001).

3.16. ISSUES AMONG KNOWLEDGE MANAGEMENT PRACTITIONERS

It is also apparent that a clear link between business strategy and knowledge management is one of the most important factors in succeeding with a knowledge management implementation. In a survey querying a number of top-management knowledge management practitioners in USA and Canada by King, Marks Jr., & McCoy (2002) about the most important issues facing knowledge management today, the linkage to business results was considered the most prominent. The key to succeeding with the knowledge management implementation was to have a view of how the implementation would provide the firm with a strategic advantage. This factor was closely tied to the second most important issue according to the practitioners; top-management support. Although top-management often do not think and reason in terms of knowledge management it was important for them to have an understanding of the advantages that functioning knowledge sharing could provide the firm (King, Marks Jr., & McCoy, 2002).

The top 10 issues from the full list of 20 as ranked by the surveyed respondents are as follows:

1. Providing strategic advantage
2. Top management support
3. Knowledge currency – *keeping the knowledge current*
4. Motivation to participate – *how to motivate employees to participate*
5. Identification of organizational knowledge – *which knowledge should be captured?*
6. Financial cost and benefits – *how to financially measure KM results*
7. Verification of knowledge contribution – *how to keep the data relevant*
8. System design
9. Sustainability – *how to establish knowledge sharing as a business process*
10. Security

(King, Marks Jr., & McCoy, 2002)
The factors highlighted by the knowledge management practitioners in the study by King, Marks Jr., & McCoy (2002) were then subjected to a factor analysis in order to determine the main categories of issues that faced the implementers of KM initiatives. The result was a subdivision of the 20 issues into 4 different categories; Executive/strategic management, costs benefits risks, operational management, and standards (King, Marks Jr., & McCoy, 2002).

### 3.17. CORPORATE WEB 2.0 TECHNOLOGIES

Several IT/IS tools have been in use in a corporate environment and have begun to earn a wide acceptance as important tools for companies to stay competitive. Examples of these mature IS include; ERP, CRM, SCM as well as PLM systems. All these systems as argued by Chui, Miller, & Roberts (2009), in a practitioner paper, are united by the fact that they automate transactions related to physical artifacts (Chui, Miller, & Roberts, 2009). In the case of PLM systems this would be the documenting and tracking of individual components of a finished products.

![Fig 3: Adoption of corporate technologies](image)

FIGURE 3 ADOPTION OF CORPORATE TECHNOLOGIES (CHUI, MILLER, & ROBERTS, 2009)

However, the new technologies, often referred to as web 2.0, have an increased social component requiring new approaches from management. Previous solutions have had a top-down nature whereby an investment is made in the new system which the employees are then required to use. With web 2.0 systems this approach is not effective as the success of the system relies on active user participation with a significantly higher degree of freedom (Chui, Miller, & Roberts, 2009).
During a study conducted by Chui, Miller, & Roberts (2009) the authors studied 50 early adopters of web 2.0 systems in a corporate environment. The study identified 6 important factors detailed below based on the success and difficulties experienced by the studied companies.

1. The transformation to a bottom-up culture needs help from the top
2. The best uses come from users—but they require help to scale
3. What’s in the workflow is what gets used
4. Appeal to the participants’ egos and needs—not just their wallets
5. The right solution comes from the right participants
6. Balance the top-down and self-management of risk
   (Chui, Miller, & Roberts, 2009)

For each of these recommendations Chui, Miller, & Roberts (2009) provide a number of examples of how it is possible to leverage the factor in able to succeed. Often the authors also include a cautionary example of how ignoring one or several of these key factors can lead to the failure of the system implementation (Chui, Miller, & Roberts, 2009).
4. EMPIRICAL SETTING
The collection of empirical data was carried out at the IT consulting firm Technia during a course of four months in the spring of 2011.

4.1. CASE STUDY ORGANIZATION
Technia is a consulting firm in the IT sector, located in Kista outside Stockholm, Sweden. The company is a leading reseller and customizer of product life-cycle management software with 280 employees and several large and mid-sized clients, mostly in Sweden and the Nordics, but also in the US. The nature of the product necessitates a close collaboration with clients in order to tailor the product according to the clients’ businesses.

Formally, the organization is divided into nine different departments along industrial as well as functional departments, facilitating the formation of communities of practice. Five departments specialize in clients in different industry segments, while the other four are responsible for various internal functions and product development. Figure 4 illustrates the organization as described on the company’s intranet.

![ORGANIZATIONAL CHART](image-url)
The company has seven offices in four different countries. Table 4 outlines the distribution of personnel with different roles in the various offices. The geographic diversity of the company further necessitates the communication within the company as some of the offices are relatively small.

<table>
<thead>
<tr>
<th>Kista</th>
<th>Developers</th>
<th>QA</th>
<th>Management</th>
<th>Administration</th>
<th>Sales</th>
<th>Middle-management</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>22</td>
<td>4</td>
<td>7</td>
<td>11</td>
<td>4</td>
<td>10</td>
<td>75</td>
</tr>
<tr>
<td>Finland</td>
<td>11</td>
<td>8</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Norway</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>USA</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Malmö/Gothenburg</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>30</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>9</td>
<td>125</td>
</tr>
</tbody>
</table>

**TABLE 4 EMPLOYEE DISTRIBUTION IN SURVEY**

### 4.2. KNOWLEDGE MANAGEMENT SYSTEMS AT TECHNIA

Technia has a number of different IT systems that can be described as to some degree functioning as knowledge management systems. One of the main systems dealing with knowledge management at Technia is the Jira Studio system. This is a cloud-based platform that is hosted in the US and consists of three main modules: a code repository, issue handling and a wiki. The code repository module is a software versioning and revision control system for the handling of all code developed at Technia. The second module in the Jira Studio suite is the issue tracking module. This module is used to document, describe, and track the handling of bugs found in the software developed. The third and final module in Jira Studio is a wiki called ‘confluence’ but mostly referred to as ‘the wiki’. Some confusion at Technia arises however as the issue handling module of Jira Studio is sometimes referred to as ‘Jira’, as is the wiki. The wiki is the main concern of this study and will be referenced as ‘the wiki’ for the remainder of this report.

The wiki consists of a number of pages that can be added or deleted by any user. Additionally a number of ‘spaces’ or hubs exist that each has a number of children or sub-pages. Although new spaces can be added by anyone, users are encouraged to find suitable space within the existing structure to place new pages. This is in order to keep a structure and provide some guidance. Additionally the wiki includes a blog feature whereby users can upload texts documenting what they are doing that will then be posted to a specific space. One such blog was kept by the CEO and posted to the main space. See Appendix II for a screenshot of the wiki.

In addition to the various tools included in Jira Studio, a number of additional information systems at Technia aim to share data between employees at Technia. A document sharing system by the name of Grace exists to share specifications and other important documents among Technia employees. The Grace system has the advantage over a pure fileserver of version tracking the document repository.
For keeping track of customer accounts a CRM system called SuperOffice is used. SuperOffice is mostly utilized by sales staff and has the features of not only keeping track of contact details of existing and prospective customers but also logging contacts and meetings.

For internal communication of a top-down fashion there is an intranet called ‘tkn’ that posts static information and is only editable by a select few. As this is a static system it is used mostly for distribution of information in a top-down fashion. Additionally HR controls a database that is accessible by Technia employees that contains information about staff called ‘Employee Central’. Finally the office tools Communicator and Outlook are used for their chat and email functionality respectively. Outlook is also used for its calendar functionality and booking of meeting rooms.

Apart from these tools that can to some degree with a sufficiently wide definition be classified as knowledge management systems Technia has a number of additional IT systems such as FLEX and Maconomy that are used for expense reporting and time reporting respectively. There also exist a few additional IT systems with significantly less usage than the systems discussed.

4.3. CONDUCTED SURVEY OF INTERNAL COMMUNICATION AT TECHNIA
During January 2011 a survey regarding the perceived quality and possible improvements in the internal communication at Technia was sent out by the responsible of communication at Technia. The survey received a total of 125 answers from people in several different roles at the company. Although the main goal of this survey was to get an overall sense of how the communication was perceived within Technia many of the questions treated aspects closely related to the knowledge management role that the wiki is to serve. The full survey can be found in Appendix I. The survey responses were analyzed by the authors of this essay. The goal of this analysis was twofold; to get a birds-eye view of the perceived and needed knowledge management at Technia and to pin-point individual persons in order to get a varied thought trough sample in the following interview phase.

The data from the survey was analyzed to examine what factors determined the perceived access to knowledge was within the company as well as the need for information from a knowledge management system. Survey responses were cross-referenced with an employee database in order to examine the relation of survey responses to various other parameters.

From the analysis a number of conclusions can be drawn. First of all the general feeling is a somewhat mediocre sense of being informed of what is going on at Technia. The answers here seemed to center on the middle option of three presented as “to some extent [informed of what is going on at Technia]”. Worth noting from Diagram 1 is the sense of not being informed that exists among the sales staff. This feeling is shared by the consultants as well. When subdivided geographically the employees in Malmö/Gothenburg are the ones who feel the most isolated from the rest of the company. This is in line with the results from the pre-study of “knowledge islands”. As would be expected management is the group that feels they have the best overview of the organization.
On a regional level it seems that the smaller offices such as Norway, Malmö and Gothenburg sense a lack of available information, the exception being the comparatively enthusiastic response by the Finland offices. This altogether points to a compartmentalization of knowledge among the various offices and possibly even the various workforces. One sales representative from outside the Kista office phrases it as: “Too much information is kept within the grapevine of [the] Kista office”.

These results don’t seem to vary with age or time spent at Technia. As outlined by Diagram 2 the responses to whether the employees feel well informed or not seem to center on the same mediocre 3 that was seen in similar subdivisions. This counteracts the intuitive hypotheses that colleagues that have stayed longer at Technia would have a better idea of what is going on in the company due to contacts in other offices. This data would support the idea of enacting a codification rather than a personalization strategy for knowledge management at Technia. This is motivated by the assumption that no knowledge management system will ever be able to replace the intimate knowledge and close contacts built with 15 to 17 years of experience, yet the average for this group is only a poor average of 3.6 as compared to the overall average of 3. Leaving out a discussion about the statistical significance of this difference, if more than 15 years at a company does not raise the average more than 0.6 points, Technia does not seem to be a suitable candidate for a formalized personification strategy but perhaps a codification strategy would be more suitable.
This distribution suggests that there is no benefit to profiling the potential interviewees based upon either age or time spent at Technia. However a selection is advised to be made with regards to the work role of the subjects as well as geographical location. As it is not possible to have an interview based upon each the intersections of role and location some strategic choices need to be made in order to get a good overview of the company. As seen in Diagram 3, not every single location has all the roles present. Therefore a third parameter of adoption is introduced in order to get a fair assessment of why people either use or do not use the wiki.

Diagram 2: Feeling of being informed by time at Technia and age

Diagram 3: Number of employees by location and role (of survey respondents)
4.3.1. **Selection of Interviewees**

There were three potential variables upon which it was possible to base the interview selection: role, location and wiki usage. As age and time at Technia seem to play minor roles in affecting employees’ need for information, those factors could be excluded. This yielded a potential of 70 (seven roles time five locations times two usage frequencies) combinations. Several of these combinations could however be eliminated. First off as seen in Diagram 3, not all roles were present at all locations. Therefore a representative portion has been selected in order to get an as wide array as possible of different views. To further narrow down the candidates the written responses to the questions were evaluated in order to select people who have a strong view about the wiki either one way or the other. The reasoning behind selecting people with a strong view is that the person is more likely to have given the setup some thought as opposed to someone who is indifferent. Additionally, the two persons jointly responsible for the wiki implementation, the head of quality and the head of communication, were interviewed, as was the CEO of Technia. The interviews are outlined in Table 5.

<table>
<thead>
<tr>
<th>Interviewee Number</th>
<th>Role</th>
<th>Place of work</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wiki Responsible</td>
<td>Kista</td>
</tr>
<tr>
<td>2</td>
<td>Wiki Responsible</td>
<td>Kista</td>
</tr>
<tr>
<td>3</td>
<td>Salesman</td>
<td>Kista</td>
</tr>
<tr>
<td>4</td>
<td>Consultant</td>
<td>Kista</td>
</tr>
<tr>
<td>5</td>
<td>Consultant</td>
<td>Kista</td>
</tr>
<tr>
<td>6</td>
<td>Project Manager</td>
<td>Oslo</td>
</tr>
<tr>
<td>7</td>
<td>Administrative Staff</td>
<td>Kista</td>
</tr>
<tr>
<td>8</td>
<td>CEO</td>
<td>Kista</td>
</tr>
</tbody>
</table>

**TABLE 5 INTERVIEWEES**
5. EMPIRICAL FINDINGS

The empirical findings section is based on the conducted interviews and influenced by the participatory observations conducted at Technia. The viewpoints are presented under a number of themes that were identified during the course of the study. The endnotes correspond to an individual interviewee.

5.1. UNCLEAR LINK TO BUSINESS VALUE

A few interviewees made comments indicating that there is no strategy in place for knowledge management, nor for the wiki. Individuals may have their own strategies for the wiki, but there seemed to be no widely agreed-upon common strategy shared by everyone in the organization.

“I would not really say that there is a strategy [for knowledge transfer]. There is some kind of basis of ideas and something that looks like the beginning of a strategy, but no strategy is yet in place.”

“The wiki just showed up, coming from [...] the US. [...] The strategy for the wiki is very unclear. [...] They forgot to decide what it was for.”

The view that the strategy was unclear was confirmed by the head of communication.

“I guess it’s not really a good answer, but the reason [for setting up a wiki] is that we got this system for free when we bought another system. It was like included in the price. And then people thought, well, why not make something good out of this.”

He continued to talk about the future of the wiki, explaining that there were not really any goals set out for how much it should be used,

“[... since] we don’t know how we want the wiki to be in the future, or what we want to use it for.”

According to the Head of Communications, there were however two purposes of having the wiki. The first was for the company to become more efficient.

“You will be able to save time by not having to look for the most recent version, you will always be informed of what has been done in the respective projects, and you will not have to send e-mails back and forth.”

The second goal was to contribute to better team spirit and morale at the company. With a geographically diverse project organization, efforts were needed to keep the entire organization together.

“[All employees should have] some idea of what is going on in the different projects.”

The Head of Quality agreed with the Head of Communication about one goal of the wiki being to improve internal efficiency. The former explained that by reusing knowledge, the efficiency of the company could be improved.
“ [...] The purpose [of implementing the wiki] is of course to lower our costs of doing things. And that in turn is of course in order to increase our efficiency and thus our profitability [...]”

Thus, the two executives shared the common goal of increasing work efficiency, but only the Head of Communication mentioned the unification of the company’s work force as a separate goal of the wiki.

Through the discussion with the Head of Quality however, emerged a third goal, which was not discussed by the Head of Communications. The Head of Quality talked about using the wiki as a collaborative document editor.

“The Wiki is my primary work tool. I upload everything I do there. To me, it is my work area, so to speak. I no longer sit down and work towards my own hard drive, to put it simply. Instead, I run all information which has relevance and interest even for me, into the Wiki. And that means that when I sit down and work with this thing all the time, what other people are doing is floating by in those latest update things.”

The CEO of Technia discussed the strategy of Technia, linking it to knowledge management. Due to uncertainties of IT projects, it is difficult to estimate the scope and cost of IT projects, she said. From a customer perspective, this often leads to IT projects not being delivered on time and not meeting price expectations. Reusing large parts of work from previous projects is an efficient way to reduce uncertainties of projects and thus increasing customer satisfaction according to the CEO.

“Traditionally [...] Technia has delivered projects that to a very large degree have been custom tailored for its customers. This leads to uncertainties in the delivery.”

Recognizing that there is a trade-off between delivering custom made solutions and standard projects, the CEO argued that Technia needs to focus more on reusing solutions in multiple projects. Custom made parts of projects means high risk and reducing the custom made parts of projects thus means reducing risk. By offering similar solutions to similar customers, it would be possible to split fixed development costs on multiple customers.

“In order to achieve [...] economies of scale, we must have reuse”

Increasing reuse is also considered by the CEO to increase shareholder value by facilitating a move from cost based selling of consulting hours, towards a pricing model based on value based selling. In order to facilitate the formation of knowledge within the company, the CEO had organized the company according to sectors, with the purpose of forming teams with sector specific expertise.

“I don’t know if Jira is the solution to knowledge management. Maybe it is too early to tell”
5.2. PURPOSE OF THE WIKI

5.2.1. PURPOSE OF WIKI IS NOT CLEARLY COMMUNICATED
A majority of the interviewees expressed that they did not fully understand the purpose of the wiki.

“I think that we need to find out how we are supposed to use [the wiki]. [...] Because the way I view it, we are unsure about how to use Jira and everybody uses it in different ways.”

“When Jira was introduced there was no clear strategy for what it should be used for, like what are our intentions of having this system.”

“It has also been said that throw everything in there, it doesn’t have to be right, but there is no basic structure in place.”

“I’d like to see a complete picture and understand what the wiki is for, what is TKN for and, well, the complete picture.”

5.2.2. LACK OF GUIDELINES AND INSTRUCTIONS
Some interviewees described that they experienced that it was not well defined what should be in the wiki and that the lack of such understanding made the wiki difficult to use. The interviewees requested more templates and a clarified structure. It appeared from the interviews that local customs of wiki usage had developed in different parts of the firm.

“I guess I am like what info should I put there?”

“If I were responsible for the wiki, there should be rules and guidelines for what should be added there.”

“I have created my own structure for what should be in the wiki. In my view, the wiki is for implementations at customers.”

“I feel that it is a bit unclear at the moment what should be where… and then we have this legacy system Grace as well, and I don’t know how those two are related. [...] It has not been communicated whether we are supposed to just add finished stuff or also work in progress.”

5.2.3. SEVERAL IT SYSTEMS FILL SIMILAR ROLES
Because there were a range of IT systems at Technia, filling similar purposes as the wiki, several interviewees described that the wiki was not always the first place to look for information. A member of the team responsible for the wiki implementation discussed the various IT systems that could be replaced by the wiki and argued that it would be able to eventually replace Grace and the intranet, as well as a specialized HR system.

“[The wiki] replaces our current intranet. And it sufficiently replaces our current document management system. [...] Then we have an old employee database [...] that [...] we should be able to kill as well.”
The fact that these systems were still operational in parallel to the wiki seemed to cause some confusion.

“I have no idea if I, when I’m looking for something, should go to the intranet (is that still active?) or to the wiki. I think it is strange that we have both.”

“What are their [the wiki’s and Grace’s] respective roles? […] It is quite messy at the moment.”

But even closing down Grace and TKN doesn’t seem to solve the problem completely, as there were also other systems that provide similar functionality as the wiki. A seller pointed out that SuperOffice filled its purpose well and clearly objected the idea of having to use the wiki in addition to SuperOffice. Ideally, the respondent wanted all sales related matter to stay in SuperOffice.

“I use SuperOffice to keep track of all my work and share it with other sellers. [...] I have [SuperOffice] open all day long on my computer.”

“We need one place, not a new place.”

From the interviews it became clear that the HR department also runs several systems providing functionality for information sharing, an Excel sheet with all employees and a system called Employee Central. The functionality of those systems overlaps the functionality of the wiki.

5.2.4. **Lack of Top-management Role Models**

Several interviewees discussed during the interviews an opinion that the top management is not involved enough in the new wiki system. Few role models to follow may have led to increased ambiguity when it comes to in what way the wiki is supposed to be used.

Almost all interviewees described a lack of management role models when it comes to knowledge sharing. A theme discussed was the request for more information about what is going on in the company business-wise and what the plans for the future are. One interviewee pointed out that new IT systems don’t solve the fundamental problem that somebody regularly and frequently needs to formulate information. A respondent requested specific and detailed information about the company’s product strategy, remarking that a sixty minute presentation at the Technia University conferences held once or twice a year would be insufficient. An interviewee who considered top-management communication to be insufficient, exemplified this view by pointing out that despite the fact that several months had passed since the current head of quality and practice was appointed to his position, there had been no information about this in the wiki or sent out by e-mail.

“The CEO has some meeting every third month, I think, and... that’s about it.”(about communication channels used by top management)

“[Information from top management] doesn’t exist.”

When it comes to how the interviewees would like to be informed about corporate matters by the management, there were quite a few suggestions. The role of management as communication role
models emerged through the interviews. Some of the interviewees recognized the wiki as a good information channel to be used by the management to distribute corporate information, while others mainly talked about other information channels. About the wiki, one employee interviewed concluded that the key factor to making the wiki “fly” is to make the management use the wiki themselves.

“The gray-haired people need to become more visible”. 6

“I would like to have corporate information distributed both by e-mail and through Jira [wiki]. [...] Then I could go back [to the wiki] and look information up later on.” 4

“The strategy is supposed to come from the top, but right now it’s way too diffuse.” 5

“I'd like to see [communication from top management] better organized - a systematic continuous stream of information.” 7

Two interviewees made a connection between the communication of top management and the culture at Technia. The impression given by the interviewees during the interviews was that, in general, the communication style used at Technia was informal, relying a lot on oral discussions. 7 Technia has had the Grace knowledge management system for a long time, but few described that system as a natural place to look in for information except than for certain documents they knew were in the Grace system.

“Technia has never been good at communicating [formally]; rather you hear stuff in the halls when visiting the Stockholm office.” 6

While the interviews showed evidence of quite some innovative wiki uses in the Technia organization, little evidence of effort put in by management to help the ideas formed by these users grow was found during the interviews. The wiki usage started in USA and the wiki is successfully used in the American part of the organization. No interviewee described any strategy for transferring what is working in the US part of Technia stated by the management. The fact that the Americans use the wiki more than others was by many, including the head of communications, described as partly a product of large geographical distances. There was still no spelled out strategy for helping the well working wiki usage from the US scale to the rest of the Technia organization.

“If something is done over there in the US, there is usually good information available about exactly who did it, so you can e-mail or call them in case you want to discuss anything. But if something is done here, there's usually not so much of that.” 4

5.3. DOES NOT INCORPORATE EXISTING CULTURE

During the interviews an informal culture was described, where people enjoy solving complicated technical problems in innovative ways rather than looking for well-tested solutions already developed. Developers were generally described as being proud of their work, sometimes too proud to borrow from others and a bit reluctant to allow others to edit what they had done without asking for permission.
5.3.1. **LIMITED CULTURE OF FORMAL COOPERATION**

During the interviews, a helpful corporate culture was described. However, it seemed that people preferred to help their colleagues using informal ways of communicating, rather than relying on formal measures. In fact, it seemed that as the company had grown during the past years, the casual communication channel of the old start-up was retained. The CEO of Technia described a corporate culture of employees traditionally enjoying a great degree of freedom with few restrictions regarding their planning of their work.  

“There is a culture of helping each other out between the projects and so on, but that is done at a very informal level.”

“I think that there is a ‘whatever it takes’ attitude at Technia. We’re dynamic and the most important is what happens here and now. People don’t have time for the formal stuff.”

“People at Technia are not at all lazy, but when it comes to formal stuff that feels a little bit irrelevant compared to what you are doing at the moment, people are lazy. You can say people like to focus on short term wins. The very nice processes that we have are stored on a bookshelf.”

Interviewees showed some skepticism when discussing whether the new wiki would be able to change the sharing culture.

“A tool is a tool, and you can add any tool but there is still corporate culture and the tool won’t change that.”

“If you have a really good tool, it can help to change the culture, but in the current situation I doubt that [the wiki has that effect].”

“Back in the days there has been many attempts to make people [formally] inform others about their project, but no one ever does that. The thing is that doing that gives you absolutely nothing in return. It’s like you have a bunch of old information that somebody would like you to add somewhere for the sake of somebody else, and you just won’t do that. You have already finished your work and there’s no time or interest in documenting it like that.”

5.3.2. **RELUCTANCE TO CONTRIBUTE**

Two interviewees expressed a reluctance to edit articles that they considered being owned by other people. They did not express any reluctance to suggest changes to material written by others, but they did not want to edit articles directly without asking for permission first.

“There’s a threshold I think, to go in and edit somebody else’s [article]. I would prefer to go and talk to that person and then maybe change if that person had the same ideas, if he or she said like, yeah go ahead, go on and change […].”

“You comment other people’s [articles], so you can have a discussion going on about a subject. […] There is not really any ownership on the pages… but you don’t want to just change stuff. […] I guess you are afraid of trespassing.”
While no interviewee stated it as a reason for not adding information to the wiki, one of the persons in the team responsible for the wiki rollout, said that some people not wanted to share knowledge because they were afraid of others editing it without asking for permission.

"Some people don’t dare to share anything because they think that someone will destroy it".  

One person described the culture at Technia as not encouraging reuse of knowledge.

"Technia is a technology firm from the beginning, and it is like what was invented here is my stuff, I invented this. […] Borrowing from someone else offers some resistance. You want to do things your own way. You say that it doesn’t really fit your purpose and then you do something else from scratch instead. Being a developer is a very creative role and should be a creative role. […] Developers think that it is fun to do new stuff. […] To some individuals, it could be about pride, that you want to say I did this."

This existence of this attitude was confirmed by a top management interviewee, who described it as a problematic challenge for the company, if it were to reuse knowledge and solutions to a greater extent in the future.

One person described keeping work on the local hard drive until it reached a "certain level of quality". Not before this stage was it ready to be uploaded to the wiki or shared using another method. Another interviewee talked about avoiding sharing work that was not ‘top notch’, a habit which led to postponing the publishing of work on the wiki. One interviewee claimed to put in a major effort to make work that was going to be shared with others really, really good before sharing it.

Another described a reluctance to formally document what could be regarded as failures or sub-par work.

"[I] gladly share what has gone well, but not what has not gone very well. […] You document the stuff that you did, that went well."

**5.3.3. SENSITIVE INFORMATION**

A person working with sales expressed that it would not be a good idea to have information about ongoing sales processes in an environment where it might be accessed by the wrong people. The interviewee found no problem at all sharing information with other sellers at the company, but did not want to make information more widely acceptable.

"I think that you should separate sales and projects. The sales information is the most sensitive information we have actually. It’s the type of information that we do not want to let go of at all, anywhere."

"Ideally, SuperOffice takes care of everything that is related to sales. (the SuperOffice CRM tool was only used by sellers)"

Another person commented that it is possible to use access restrictions in the wiki environment, even though the Grace system was found to be better suited for projects with access restrictions than the wiki.
“Roadmap and that kind of stuff is borderline, it’s a trade-off. […] There are a few different variants, we actually have quite some files in our own wiki for the product development team, I mean you can set access restrictions on the stuff.”

One person in the wiki implementation team talked about the IT department, frequently using the wiki but putting all information in a closed area where only a few people had access. He could not understand why they did not want everyone in the company to access the information.

“They had a need to cooperate around the information that they handle. So [the head of IT] wanted help to add an area for that. So he got a page that’s called Support’s Secret Stuff. And that page is access restricted to the IT department only. And they have their info, use it actively on that page, but they don’t dare to make it publically available. And I find that tremendously interesting”.

5.4. INSUFFICIENT INCENTIVES TO SHARE

Adding information to the wiki does take some effort. This was discussed by almost all interviewees in one way or another.

During the interviews, many voices spoke about the lack of incentives to share knowledge on the wiki. One interviewee pointed out that documentation work is increasingly being valued at Technia, but billable hours still is the number one goal.

“I probably need to be forced to add stuff, it needs to be part of my deliverables […] You need that little whip to get stuff done.”

“Some people don’t care about it, they say: ‘what do I get from adding stuff to the wiki’”

“What is important is that we make money, and I think that’s the way it is in all companies.”

(about why internal documentation has low priority)

Several interviewees discussed documentation and ‘making stuff reusable’ in relation to the priorities at the firm. While interviewees agreed that reusing the same principles in different projects and avoiding ‘reinventing the wheel’ was an important part of the company’s strategy, few described that contributing to reuse was a number one priority for them. In the conflict between short term gains (billable hours) and long time gains (reusable solutions that can be sold many times to multiple clients), through the interviews a picture emerged of a bonus system favoring the short term gains.

“As the bonus system works today, the incentives to share knowledge with colleagues and other projects are purely indirect. People are measured on a very general level so there is no direct connection to variable pay. […] If you are to advance to a management position however, your ability to contribute knowledge to others is a factor that is assessed.”

“The thing is that we do what we are supposed to deliver to our clients. And then documenting things for our own internal purposes is not included. And people say that we need to do as much as possible for the client. And when we reach the point of delivering to the client, well then there is no time left to document for internal purposes. Then you need to get the next project started.”
Interviewees seemed to request some kind of incentives for engaging in knowledge transfer and documentation work. That increasing knowledge reuse was named a top priority by management was not considered to be enough to motivate some of the interviewees.

“There are no economic or other incentives to make reusability. It is clearly said that we should make reusability, but there is nothing to motivate us.”

“At the firm it is being said that we need to get better at re-using and so on, but there are no incentives for that […]”

The CEO however stressed that there are numerous other types of incentives than money, for example freedom of planning your own work, the possibility to work with interesting projects and so on, and that these types of incentives were likely to be at least as efficient as monetary incentives.

“There are always people who say ‘if we just pay people, they will do it’. But that’s not the kind of company that I want to build.”

5.5. PROCESSES NOT ADAPTED TO THE WIKI

It seems that for many members of the Technia organization, the wiki doesn’t have a natural part in the work flow. One explanation of this might be that the system is new.

“Sometimes [I need to find information that is in the wiki] but I’m really bad at logging into the wiki to look for it. […] I really don’t know why.”

5.5.1. SHARING TAKES TIME WHICH IS A CONSTRAINED RESOURCE

Many interviewees described lack of time as the primary reason for not adding information to the wiki. One interviewee pointed out that documentation is only done when there is time left after everything else has been done. Wiki documentation work did not seem to have a natural spot in the workflow. This view was shared by another interviewee, quoting time as the major reason for not adding articles to the wiki.

“My problem is that I have a hard time finding enough time.” (about why not documenting work in the wiki system)

“When you sit and work and have a lot of stuff to do, you don’t see any obvious benefit of sharing information on the wiki, you just see that doing so would mean two extra minutes of work.”

“I have a deadline on Wednesday next week, a lot of functionalities that need to be finished by then, and of course I prioritize getting the functionality ready before documenting it. I’m thinking that I’m going to do the documentation work later, but then I’ll be caught up in something else instead.”

“It doesn’t happen every week, but sometimes when I have a little bit of time over, I go in and write about something good that I’ve got to write about.”
A person responsible for the wiki commented:

“There is sort of an attitude that the wiki is an extra unit of work. It’s like people think that first I do a lot and then I am expected to put all of this information up on the wiki afterwards and make it available to everyone.”

5.5.2. **SOME USERS PREFER OTHER COMMUNICATION CHANNELS**

Quite a few interviewees made comments indicating that communication through a wiki is not adequate for the type of knowledge transfer processes they are interested in. One theme discussed by an interviewee was the need of two-way communication. In the view of this employee, the wiki is limited to transferring information in the form of documents, which is equivalent to one way communication. Further, interviewees argued that the commenting functionality in the wiki didn’t enable efficient and dynamic conversations. E-mail and communicator applications, similar in functionality, were found to have the same shortages. The fact that simply talking to people was considered easier than finding information in the wiki was also brought up and discussed. Several interviewees discussed that it is simply more convenient to just walk over to people and talk to them rather than use the wiki. It was also argued that spontaneous meetings were better suited for project communication than using IT systems. The reason for this would be because significant parts of meetings were, according to an interviewee, usually focused on discussing how to solve customer problems, something which is not easily done using a wiki. One person pointed out that information about the business should be given orally, not through some web page or similar means of communication. It is worth noting that the team responsible for implementing the wiki did say it was not aiming to reduce the amount of face-to-face meetings.

There appears to be differences within Technia when it comes to the preferred means of communication. One person said that sellers are generally more inclined to use the phone rather than looking for information in the wiki, while another commented that customers tend to use the phone rather than make comments in the wiki. A third pointed out that since she is co-operating with Dassault, she needs to use e-mail and the telephone a lot, since that’s how the people at Dassault communicate. A few people had little objections to using e-mail and argued that e-mail is easier to use and better suited for communicating than a wiki. One person explained that if she believes that there is somebody in the US that for example has a presentation that she would like to reuse, she would e-mail that person. Another interviewee commented that e-mail is by her considered to be the natural tool for collaboration. Another interviewee preferred to use the tool WebEx in combination with ordinary document sharing to distribute information about her responsibilities.

“Short messages and texts sent back and forth are way too open for interpretation.”

“Putting together offers or making tenders and similar stuff is sort of a creative process – you need to discuss.”

“Often I know what people have been working with, since I have been here for a while.”
“It’s the network!” \(^5\) (on why e-mailing questions is better than finding information in the wiki)

“You send e-mail messages back and forth between colleagues and thrash questions over.” \(^3\)

### 5.5.3. CRITICAL MASS OF HIGH QUALITY INFORMATION NOT YET REACHED

Several interviewees made remarks about the quality of information in the wiki being low. Information had been added to the wiki without ‘quality filters’, leading to the wiki containing articles that simply were not good enough to be useful.

The fact that they don’t expect to find what they are looking for in the wiki seems to be a reason for some interviewees not to use the system. A few commented that the documents she needs to find probably aren’t available in the wiki, but in other, older systems.\(^3,5\) This was stated as a reason not to use the wiki.

“We had Grace before and now we have Jira, but sometimes the information is not there, so you still have to ask [questions], somebody might know something”. \(^5\)

“Well, if you build a foundation of information, naturally more people [will] go in”. \(^4\)

The fact that some information in the wiki was considered by interviewees to be of low quality was described by some interviewees as a reason for not using the wiki, while at least one member of the team responsible for the wiki implementation didn’t consider this to be a problem.

“We need updated information. Information that is not updated is not useful” \(^3\)

“[The wiki] is full of half updated pages and it is incomplete. You know that something is going on, but you target the source instead to get updated information.” \(^5\)

“When you just make something available on the wiki, you shouldn’t, in my opinion, be very afraid. You just throw it up there and somebody might make use of it. If it later is refined and becomes so good that it really should be actively distributed, then you make sure that it is of good quality and push it out, afterwards. […] And this means that a lot of the stuff that is cooking isn’t really correct. But at least it is something that can be worked on.” \(^2\)

### 5.6. LOW USABILITY OF THE WIKI

One interviewee stated that the wiki was difficult to use.

“I don’t like the interface. It is messy and you’re like ’oh well, where am I supposed to go now?’”\(^5\)

Several, however, thought that the interface might be a problem for other people.

“[The sales people] are bad, they don’t understand the tool.” \(^2\)

“I simply don’t think [other people at the firm] understand how to use it.” \(^4\)
“I don’t feel that I have any problem at all using the wiki, but I know there are other people who don’t understand how it works and think that it is a bit complicated.”

One interviewee complained about the wiki being slow to use, saying that the loading times were long and that the wiki needed to be fast.

When discussing the process of opening up the wiki, one interviewee complained that ”[you] need to actually act to get into the wiki”, stating ”that is an obstacle.”

“I think many say like, I don’t care about this.”

One interviewee, working with sales, expressed great content with the SuperOffice tool and using the telephone and e-mail. Pointing out that he gets all the information he needs, he saw no point in learning to use another tool.

5.6.1. IT IS DIFFICULT TO NAVIGATE AND FIND INFORMATION IN THE WIKI

The fact that the wiki was considered to be difficult to navigate was by several interviewees stated as a reason for not using the wiki. One person complained particularly about information from the HR department, saying that it was messy. In general however, the complaints regarded the structure of documents in the wiki, which was considered by the interviewees to make using the wiki difficult.

“I’d prefer an old-fashioned tree structure. Then I understand where to find what I’m looking for. As it is now, it’s just too much at once.”

“It’s like the wild west in there.”

“It’s a trash pile actually, you just throw stuff there. There is no thought of structure or order.”

“I need to discuss the projects with the business consultants. Exchange documents and so on. I send requests about information to all of them by e-mail and they respond back to me. It is really difficult to know if the information that I am looking for is in the wiki. It is not structured in that way. It just feels like a bunch of documents. It makes no sense. And it needs to be structured to be easily accessible. I know what different people know, and that makes it easy to find information by calling or sending e-mails.”

Several interviewees commented the fact that it is difficult to know that status of an article in the wiki. The fact that the old Grace system has extensive life cycle management of documents, while the wiki lacks that functionality seemed to cause some confusion. One interviewee pointed out that it is impossible to know if a document in the wiki is valid or not.
A few interviewees complained about the quality of the search function. Search results were found to be often largely irrelevant.

“The search engine could be cleverer, it is easier to find information if you have a search engine that is helping you and really finds what you are looking for.”

One interviewee pointed out that due to firewall settings and security restrictions, some customers had been unable to access the wiki at all.
6. DISCUSSION

6.1. KNOWLEDGE MANAGEMENT AT TECHNOIA

Although several systems could ostensibly be categorized as a KMS at Technia, the focus of this study is on the wiki system. Several of the other systems do indeed manage knowledge by a wider definition of the term. For example the code repository would fit nicely with the ‘commercial’ KM strategy of Earl (2001) as it is indeed a way of managing and commercializing intellectual property, in this case code. However with regards to the data-information-knowledge hierarchy this system would be more suitably classified as containing information or possibly data. (Alavi & Leidner, 2001) Similarly, the issue handling system as well as some internal systems, e.g. Maconomy/FLEX and employee central, falls somewhat short on the hierarchy to be an interesting candidate for actually reusing the experiences of employees.

There are however a number of IT-systems that do indeed fall within the theoretical definition of a knowledge management system as regarded in this study and could be said to contain knowledge. (Alavi & Leidner, 2001) These are often mentioned in the interviews as potential alternatives to the wiki and will therefore be regarded as KMS for the sake of a debate on the strengths and weaknesses of the wiki. In this category is SuperOffice, the sales database, which could indeed be regarded as a KMS of a limited nature. The information to input into this system is clearly defined and allows limited room for reinterpretation by the user. SuperOffice would fall in the ‘engineering’ strategy of Earl (2001) as it provides the user with defined knowledge when needed.

The intranet or ‘tkn’ is however harder to define with regards to KMS. It could be regarded as representing an earlier generation of KMS where the synthesized knowledge is filtered through a knowledge factory. (Chau & Maurer, 2005) When used as a KMS rather than an information dissemination tool it is therefore somewhat static and provides users with information that has been filtered and formalized providing a level of legitimacy that however is somewhat dated.

Finally, the email and communicator systems could to some degree be regarded as KM systems if regarded within the context of a ‘personalization’ strategy. (Hansen, Nohria, & Tierney, 1999) The email system contains a database of all employees along with their titles thereby providing some limited context by which to get contact with employees harboring the desired knowledge. Similarly, the communicator is essentially a chat program to facilitate communication and therefore of limited functionality when compared to the wiki.

6.1.1. KNOWLEDGE MANAGEMENT STRATEGY AT TECHNOIA

A wiki system is difficult to place on the personalization – codification spectrum, often used for categorizing approaches to knowledge management. The system has a number of clear codification components such as writing down and documenting processes and lessons learned. The goal being for employees to be able to search and navigate the existing information then assemble it into new formations to solve problems. (Hansen, Nohria, & Tierney, 1999) Yet this classification quickly
becomes lacking when examining the wiki software. By providing functionality such as the names of
the collaborators for each page, commenting functionality, blogs and contact details of employees a
number of key personalization components are included in the system. The ‘phonebook’ aspect of
the wiki is enabled by providing the users with not only the contact details of active users but also
effectively a list of their competences and interests by examining their edit history. (Hansen, Nohria,
& Tierney, 1999) The wiki can therefore be classified as a new generation of knowledge
management system. (Hasan & Pfaff, 2006) Since the wiki contains elements of both these two
fundamental strategies, the usage seems to be more based on the preferences by users. Indeed, a
hybrid usage pattern seems to have emerged with initial inquiries directed at the codified knowledge
available in the system. When the information is lacking or insufficient, additional sources are sought
out such as the code in the case of development related information. For more complicated inquiries
the employees often contact the person responsible directly. This usage also renders a clear position
of the wiki in the knowledge management strategy taxonomy by Earl (2001) difficult. In his
taxonomy the current usage would fall somewhere in-between the ‘systems’ and ‘cartographic’
schools yet falling sufficiently short of the ‘strategic’ school. (Earl, 2001) The goal of the wiki could
however be stated in regards to the Nonaka (2007) SECI-model as attempting to transfer tacit
knowledge to explicit, termed ‘externalization’.

It can also be noted that Technia is in a somewhat transitional phase. There has been a move away
from ‘business as usual’ whereby new business models needed to be explored. This reflected in the
organization, by exploring new geographical markets, as well as the knowledge management by an
increased focus on reuse. The increased focus on reuse takes Technia from fitting in squarely in the
Prencipe & Tell (2001) landscape as a T-shaped or navigator company with a focus on interpersonal
communication and meetings, towards an exploiter or staircase landscape. Although Technia is not
yet an exploiter company it has all the makings of implementing that strategy.

6.1.2. **Top Management Participation**
One issue the empirical findings pictured as an impediment to the successful implementation of
wiki-type knowledge management system is the limited participation by top management. This issue
however seems to be of limited consequence in regards to previously published studies. Often the
top contributors are not among the management staff. (Chau & Maurer, 2005) The issue of
management participation is also conspicuously missing when knowledge management practitioners
are questioned about the most important issues to resolve. They do however list top management
support as the second most important issue thereby signaling that the actual information provided
my management is of lesser importance than the signals sent regarding company priorities. (King,
Marks Jr, & McCoy, 2002)
6.2. LINKING WIKI TO BUSINESS VALUE

One of the key factors successively highlighted from previous experience is the clear message that knowledge management cannot exist in a vacuum. It is only once knowledge management is used to achieve a clear and explicit goal that the system will reach its potential and accomplish gains. (McDermott & O'Dell, Overcoming cultural barriers to sharing knowledge, 2001) Therefore it is only once a clear business strategy in regards to knowledge management has been determined that any KM strategy can be decided upon. This point is driven home by practitioners listing ‘providing strategic advantage’ as the single most important in developing a KM strategy. Only once this business value has been explicitly stated can the means of getting there, the knowledge management strategy, be explored. Following the decisions made in regards to developing a KM strategy several technical aspects will need to be considered to support the organization in its goals. (McDermott, Why information technology inspired but cannot deliver knowledge management, 1999)

6.2.1. KNOWLEDGE MANAGEMENT LINKED TO BUSINESS VALUE

In the case of Technia, three different business values of having the wiki were discussed by interviewees:

1. Efficient knowledge management facilitates reuse of tried solutions and transfer of knowledge between different projects. Reducing the innovative components of deliveries arguably decreases risks and thereby costs, leading to increased profit.
2. Especially for geographically separated teams and large projects, a good knowledge management system arguably has the ability to improve teamwork and exchange and creation of knowledge within a project.
3. Making knowledge from various parts of a large organization easily accessible for all members of the organization can be argued to increase the efficiency of the organization, by reducing the need for members of the organization to contact one another, requesting information.

While management and top management interviewees discussed the business value of efficient knowledge management extensively, this discussion does not seem to have affected the goals and usage guidelines of the wiki. The decision to start using a wiki system for knowledge management was not taken based on explicitly stated assumptions about business value as a result of using the system.
By having a clear view of the business values the wiki system is supposed to deliver it is possible to establish goals for the wiki system. However, the organization studied has not chosen to do so. Whatever the reason is for Technia not having set up goals for the wiki, clearly linked to business value, the results are interesting. By deciding what purpose the wiki is set to serve, it would have been possible to set up a structure, construct guidelines for usage and otherwise design the wiki with the goals in mind. Instead encouraging people to publish anything lead to the wiki mainly contributing business value by facilitating project internal communication. Hence, the wiki failed to meet two out of three possible business value contributions discussed by interviewees. The one area where the wiki did produce business value was internal project communication. In fact, that area is characterized by a somewhat more top down oriented approach, as each project had its own project manager.

6.3. CLARIFYING THE PURPOSE AND USAGE OF THE WIKI

Once a tangible business value of knowledge sharing can be identified in the company there is a need to define what the wiki is for in order to help users understand its purpose. The lack of a clearly defined purpose for the various systems seems to be one of the objections put forward when discussing the lack of use of the wiki. This is in line with the example of an information junkyard put forward by McDermott (1999) whereby the project failed due to an insufficient understanding of the user needs. These objections could possibly be disregarded with the argument that the adaptive nature of the wiki allows users to themselves define its purpose. Chui, Miller, & Roberts (2009) however argue that many of the objections found in the academic literature are present also among companies currently deploying web 2.0 technologies. This is highlighted by the fact that the two main tips to practitioners are that creating a bottom-up culture requires help from the top and that users need help to scale successful experiments. This contradicts the myth that new technology will create self-organizing systems without any help from management. The lack of guidelines for a wiki was also shown to be an impediment by Holtzblatt, Damianos, & Weiss (2010) further demonstrating that the new technology is not exempt from the limitations of previous medium.

Instead it seems that successful web 2.0 projects need to be fostered in a hospitable environment created by management and guided by a clear and tangible business value. (Chui, Miller, & Roberts, 2009) (King, Marks Jr., & McCoy, 2002) The new technology does however not pose challenges to the company’s knowledge management forcing them into a role as rather stewards of information instead of attempting to neatly classify the knowledge in boxes (Burkharda, Hilla, & Venkatsubramanyana, 2011).

A way of providing employees with such an environment would be to first and foremost think through the usage of the knowledge management system in order to find out what its key advantages are. At Technia the primary users and ones who derive the most value from the wiki are firstly the developers who have to find ways of sharing information of a technical nature amongst themselves and in self-organized communities of practice. Secondly consultants are able to find needed information and can identify who suitable people to contact are. Lastly it seems that utilizing the wiki in line with the business strategy of reuse a lot of value could be added by incorporating the
sales staff in the wiki system to provide information on what has been developed as well as what would constitute reuse and what would need to be customized. Along with this is a need to draw clear guidelines for what is supposed to be included in the wiki. Concerns that the quality of information in the wiki varies too much to render the entire system could be mitigated by defining when an entry into the wiki is desirable.

One purpose of the wiki, the intra-project communication, seems to be functioning successfully. However, when finding a suitable way of working with the system it is difficult for individual users to spread the innovation to the rest of the company. Therefore it is important with management help to lift up, encourage and promote successful uses of the system.

6.4. INCORPORATING EXISTING CULTURE

One of issues that arose from the interviews is that Technia has a strong organizational culture. The company is populated by developers who relish the opportunities Technia offers in developing fun, new and interesting ideas. This creates a culture according to the interviewees where it is ‘fun to reinvent the wheel’. Developing new ideas from scratch in order to attribute a sense of ownership often trumps the organizational strategy to enable reuse in code as well as knowledge. The culture of ‘reinventing the wheel’ needs to be negotiated and fused with the goal of decreasing the customization, a challenge the top management is very well aware of. There is also a sense of favoring short-term gains within the company at the expense of long term planning and often knowledge sharing activities. Here an effective knowledge management system could serve a purpose as a cheaper way of spreading knowledge within the company as opposed to costly seminars and courses.

McDermott & O’Dell (2001) describe the cultural aspects of implementers of successful knowledge management initiatives as building on the core values of the organization. Dismissing the fun aspects of working in a company such as Technia is not an option as it would counteract many of the reasons people choose to work there. However this does not necessarily contradict the idea of reuse and sharing, as long as fun new solutions can be built on existing innovations thereby facilitating Technia’s transition into a service providing company.

The combination of a personalization and codification strategy that the wiki enables also seems to be a suitable match with the Technia culture. Doing so enables employees to not only find information about a subject but also see who is knowledgeable within the subject, a method that seems to predate the wiki implementation. Although Technia has previously been largely reliant on a personalization approach, the results of the survey indicate that there is no increased sense of being informed when spending many years at the company. This indicates that the personalization approach used is not sufficient. Therefore the addition of a codification element seems important. The fact that Technia as a company is geographically diverse and the complaint of employees of being isolated when working in the smaller offices point to a need for increased codification.

Technia is today organized in vertical business areas, a way of implementing the reuse strategy in order to seek several clients within the same sector. This is a sound strategy but does however risk a
degree of compartmentalization creating islands of knowledge that could be of use to other verticals. The wiki could potentially be a way to develop horizontal communities of practice in order to facilitate knowledge transfers between verticals centered on wiki spaces. This practice is presented by McDermott & O’Dell (2001) as a way of building upon existing networks in the company, a key to aligning the KM strategy with existing culture. They suggest legitimizing successful communities of practice by awarding them time to discuss issues as well as a budget.

### 6.5. INCENTIVES NOT ALIGNED

A large part of the knowledge management literature is directed towards creating incentives for employees to share the knowledge they possess, an act that costs time and effort and is not cheap. The incentives for wiki seem however to be even more a case of encouraging altruistic behavior than earlier IT systems. Wasko & Faraj (2000) showed that community owned collaborative knowledge encourages users to participate freely and willingly spurred mostly by a moral obligation and intangible benefits. The focus on promoting knowledge sharing with softer rewards is supported by Bock, Zmud, & Lee (2005). They however find that the greatest motivator for knowledge sharing is the feeling of reciprocity, a factor lacking in the utilization of the wiki at Technia. Although employees receive the reciprocity with regards to email and personal exchanges this study found no evidence that users expected to get anything in return for contributing to the wiki. Bartol & Srivastava (2002) discuss the fact that monetary rewards can be difficult to gauge when it comes to knowledge sharing as an additional impediment to using extrinsic monetary rewards.

It seems that an important factor in contributing to a knowledge management system is some form of reward, not because it is a silver bullet but because it signals the priorities of the company and management. McDermott & O’Dell (2001) found that it was important to align reward and recognition with knowledge sharing. During the study at Technia no evidence of such priorities was expressed by any of the employees. The importance of signaling the prioritization of management was expressed as; ‘appeal to the participants’ egos and needs – not just their wallets’ by Chui, Miller, & Roberts (2009).

Bartol & Srivastava (2002) bring forward employee evaluations at the company Capgemini that require participation in knowledge sharing in order for employees to get the highest evaluations. Although employees at Technia have a factor in their evaluations that is supposed to incorporate the collaboration aspect, this part is nowhere near as explicit as that of Capgemini. A system whereby knowledge sharing that leads to implementable reuse is rewarded and recognized in employee evaluations could encourage sharing as well as give a resonant signal of management prioritization.

### 6.6. PROCESSES NOT ADAPTED TO KM AND WIKI

One of the practical tools of management is the use of business processes to influence behavior. This tool seems to have stayed in vogue for the transition into web 2.0 technology such as the wiki. It is brought forward as one of the main issues within the field of knowledge management and deemed important in the study conducted by King, Marks Jr., & McCoy (2002) where it is mentioned as a prerequisite for sustainability. They argue that the only way to maintain the KMS is to have the maintenance and updating as part of the business processes. This point is further driven
home by Chui, Miller, & Roberts (2009) when advising practitioners how to make web 2.0 work. They put the answer as bluntly as ‘what’s in the workflow is what gets used’. It thereby seems that collaborative tools are not exempt from the previously established KM practices.

The limited extent of processes that enable knowledge management is especially visible at Technia. The organization has for a long time focused on reselling and customizing an existing system. Therefore the focus has firmly been of the billability, i.e. the hours towards a customer project, of each employee. This is in turn reflected in the processes where time not devoted to the client project is discouraged. As the employee bonuses are based upon each person’s billability and the act of documenting and sharing knowledge is not included in this category, it effectively creates a negative incentive to document what you know. This effect could be mitigated by including the knowledge sharing processes in existing workflows or as a part of the project work.

6.7. USING TECHNOLOGY TO AID USERS

The empirical findings indicated that low usability was a major factor causing Technia employees not to use the wiki as a primary source of information. The structure was found to be missing or at least difficult to understand and the search function was in practice declared unusable. In addition, the low quality requirements on material published on the wiki has lead to the creation of what McDermott (1999) refer to as an information junkyard. This in itself is a usability problem, as people find low quality information reflecting outdated knowledge when scanning the wiki for information. The usability problems of the wiki have obvious implications for the ability to function as a conveyor of knowledge.

It seems that the lacking, or at least insufficiently explained, structure of the wiki impeded wiki usage in two ways. First, it made it difficult for employees to find information in the wiki. The long term effect seems to have been that it has been difficult for the wiki to become an integrated part of the natural work flow at the company. People preferred to use other channels of communication when looking for information, rather than looking for it in the wiki, simply because they knew that finding it in the wiki would be difficult. This problem seems to have been amplified by the sub-par performance of the wiki search engine. Secondly, the unclear structure seemed to make people refrain from adding knowledge to the wiki. It was simply not considered clear in what place information should be written. A further impediment preventing the wiki being used at its full potential is likely to be the fact that the tools for editing articles were found to be difficult to use by some members of the case study organization.

The policy of allowing and encouraging people to publish almost anything, without specific requirements on either content or quality had led to a large bulk of wiki articles that were unusable as sources of knowledge. Some were found to be too old and some were found to be simply not good enough. The fact that people didn't expect to find useful information was found to be a reason for avoiding using the wiki. This indicates that some type of a threshold value might exist – a maximum amount of low quality or outdated articles that can exist in a wiki environment before users turn to other sources for finding knowledge. Simply put, users might accept that a certain portion of their searches for information yield unusable results and might even sometimes consider
editing and improving such information. However, when the ratio of unusable to usable information becomes so high that users beforehand expect a knowledge management system to return unusable information, they will turn to other sources for finding information.

A part of improving usability is to find a better structure of articles that make users able to understand where to find and store information. The search function would also benefit from being improved. However, even a state-of-the-art search function of today would have problems distinguishing sub-par quality articles from high quality articles automatically. This links the issue of usability firmly to the quality requirements on articles in the wiki.

By clearly defining quality standards for wiki articles, many usability problems could be avoided. If irrelevant information and low quality articles were removed, valid results would show up higher in the search results, improving the usability of the system. It seems reasonable to argue that a wiki can support a limited number of low quality articles, before users find the system difficult to use or unfit for its purpose. This poses an interesting challenge, especially when setting up a new wiki system. The findings suggest that the development and implementation of pre defined templates and clear guidelines would likely increase the quality of information in the wiki and thus the quality of the wiki as a knowledge management system.
7. CONCLUSIONS

This thesis was written with the purpose of exploring the relatively new area of corporate wikis within the knowledge management field. The aim of the study was two-fold: to explore factors influencing knowledge sharing through corporate wikis and to compare and contrast these factors with previously identified issues within traditional knowledge management systems. Six main factors were identified as crucial to the adoption of a wiki knowledge management system. These factors can also be seen to hinge on one another and a proposed logical order is listed below.

The first factor found to affect the knowledge sharing is to establish a clear link how the wiki will contribute to tangible business value. Only when this connection is clearly stated and accepted by management is it possible to develop a knowledge management strategy aligned with the perceived opportunity. When the system is associated with a business goal several of the additional succeeding factors become easier to implement with top management support and the knowledge management strategy will have a goal. Therefore, the remaining five factors can be seen to hinge on this initial step.

The second identified factor is to inform users of the purpose of the wiki and how the system is expected to be used. Without a purpose clearly communicated, it is difficult for users to know how to use the system in an effective and coordinated manner. The case study showed that while some users had developed their own goals and guidelines for the wiki usage within project, the majority of users were confused. Relying entirely on self-organizing establishment of rules does not seem to be enough in order to create sustainable wiki based knowledge sharing practices, but rather a purpose and usage guidelines need to be formalized during the wiki adoption.

The third factor found is to make sure the knowledge management strategy incorporates existing culture. Wikis can be adapted to become a component for organization using both codifications and personalization strategies. While a wiki can be a part in such a transition, its structure allows for other implementations as well, indicating a need for management to be aware of knowledge management culture and working actively with the wiki in order for it to fit naturally with the way of working at the company. Culture is an issue even more prevalent with a wiki type system compared to with a traditional knowledge management system, since a lot of autonomy is given to individual users.

The fourth factor emphasizes aligning the incentives of individuals to the desired outcome with regards to the knowledge management strategy. Although contributors to collaborative knowledge management tools seem to be motivated more by recognition and community spirit, rather than monetary gains, encouragement seems to be as important as ever in a wiki based system. Whether this includes knowledge sharing as a parameter in employee evaluations or the signaling of the importance of the activities by management, employees only contribute if they feel it is a prioritized area. In the single case explored in this essay, an incentives system focusing on billable hours was an obstruction to long term documentation and knowledge sharing.
The fifth identified factor was to include knowledge management activities in the work processes. This is first and foremost in order to remove any obstacles that the users might experience to contributing knowledge. Without the inclusion of knowledge sharing activities in the workflow of the company a negative incentive is set that obstructs the engagement in knowledge sharing activities. This crucial step does not seem to have become any less prevalent due to the collaborative nature of the wiki, at least not in the case focused on by this essay.

Lastly, the study indicates that usability related issues are affecting employees’ willingness to use the wiki. This finding indicates that the view of Hasan & Pfaff (2006), that wiki users do not need any technical skills, may be incomplete. In fact, the empirical findings of the study indicate that the collaborative nature of wiki systems introduce new usability issues, not commonly found to be a problem in traditional knowledge management systems. In particular, the very open structure, where users themselves organize articles according to their own minds, led to the system being ostensibly unstructured and difficult to navigate, introducing a wiki specific usability problem. The difficulty to navigate the structure of the wiki also accentuated search function usability problems, since users tended to rely on the search function to find information. To mitigate these issues tools such as templates, guidelines and a clear structure can be used.

The six identified critical factors are similar to the areas that previous researchers have shown to be important determinants to knowledge sharing through traditional systems. Therefore, the findings of the study indicate that any hypothesis stating that collaborative knowledge management systems differ greatly from traditional systems when it comes to what factors affect sharing of knowledge needs critical examination. Wikis do not seem to represent a new paradigm in knowledge management system, at least not when it comes to factors driving their success.

The empirical evidence presented in the present essay indicate that the bottom-up nature of wiki knowledge management systems may introduce challenges not commonly associated with traditional knowledge management systems and that the new grassroots technology indeed does need help from the top.
7.1. CRITISISM AND SUGGENSTIONS FOR FUTHRE RESEARCH

As this study is based on a single case, conclusions drawn from it need to be verified by others. As stated in the introduction, one of the reasons for conducting this study has been to explore an interesting new area and laying the ground for future research on the subject. It can be argued that the findings of the present study may have limited relevance beyond the studied organization. However, if other organizations implement a wiki system identical to the one explored in this thesis, and that it therefore to some extent may be possible to analytically generalize findings to other settings in similar organizations and situations. The authors consider the primary contribution made to be in-depth descriptions of factors affecting wiki usage in a single case study.

It is important to note that the findings of the present study are likely to not be exhaustive. The approach used, focusing on a single, somewhat failed, wiki implementation with a few in-depth interviews is likely to have missed factors that are important factors affecting wiki-based knowledge sharing. Further case studied of similar and different organizations are needed to explore both factors missed by the present study as well as whether factors found to be important in the presented case study are important in other settings as well. Examining wiki implementations in less technology oriented settings would also be interesting. An important aim for researchers wanting to understand one of the most prominent developments in social knowledge management software will be to develop theories focusing on the social and collaborative aspects of wiki usage and the interplay between management and employees in making the grassroots technology beneficial for organizations as a whole.

The case explored in this thesis indicates that the main strength of wiki technology – the highly collaborative bottom-up approach – is not necessarily always a point of strength. Effective and efficient knowledge management strategies do not seem to emerge from the social web collaboration taking place within wikis. IT consulting firms, such as the organization studied in this thesis, are focusing on building structural capital. I doing so, it is highly relevant to capture knowledge found in the grassroots of the organizations and turning it into usable organizational knowledge. Therefore, research on bottom-up knowledge management technology will be an interesting topic for future research. Further exploration of the bottom-up nature of wiki technology is required to understand if and how the success of other grassroots initiatives can be transferred to the corporate environment.

7.2. ACKNOLEDGEMENTS

The authors would like to thank Technia AB for the opportunity and access to key persons within the organization with a special thanks to Erik Johansson and Anders Ingestedt. The authors would further like to thank Anna Jerbrandt and Charlotta Linse for supervision and guidance during the thesis project.
8. BIBLIOGRAPHY


9. APPENDIX I ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>COP</td>
<td>Communities of practice</td>
</tr>
<tr>
<td>CRM</td>
<td>Customer relationship management</td>
</tr>
<tr>
<td>CS</td>
<td>Computer science</td>
</tr>
<tr>
<td>ERP</td>
<td>Enterprise resource planning</td>
</tr>
<tr>
<td>HCI</td>
<td>Human-computer interaction</td>
</tr>
<tr>
<td>HR</td>
<td>Human resources</td>
</tr>
<tr>
<td>HRM</td>
<td>Human resources management</td>
</tr>
<tr>
<td>ICT</td>
<td>Information communication technology</td>
</tr>
<tr>
<td>IS</td>
<td>Information system</td>
</tr>
<tr>
<td>IT</td>
<td>Information technology</td>
</tr>
<tr>
<td>KM</td>
<td>Knowledge management</td>
</tr>
<tr>
<td>KMS</td>
<td>Knowledge management system</td>
</tr>
<tr>
<td>PLM</td>
<td>Product life-cycle management</td>
</tr>
<tr>
<td>SCM</td>
<td>Supply chain management</td>
</tr>
<tr>
<td>SECI model</td>
<td>Socialization externalization combination internalization model</td>
</tr>
<tr>
<td>Wiki</td>
<td>Browser accessed information database where users can edit contents</td>
</tr>
</tbody>
</table>
10. APPENDIX II WIKI SCREENSHOT
## 11. APPENDIX III COMMUNICATION SURVEY

1. I’m well-informed of what’s going on in the company

<table>
<thead>
<tr>
<th>Answer</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To a very great extent</td>
<td>3</td>
</tr>
<tr>
<td>2. To a great extent</td>
<td>23</td>
</tr>
<tr>
<td>3. To some extent</td>
<td>71</td>
</tr>
<tr>
<td>4. A little bit</td>
<td>27</td>
</tr>
<tr>
<td>5. Not at all</td>
<td>2</td>
</tr>
</tbody>
</table>

Comments (optional)

2. The quantity of internal information is

<table>
<thead>
<tr>
<th>Answer</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Too much</td>
<td>5</td>
</tr>
<tr>
<td>2. Just right</td>
<td>44</td>
</tr>
<tr>
<td>3. Too less</td>
<td>77</td>
</tr>
</tbody>
</table>

Comments (optional)

3. It’s important for me to know what’s going on in other business areas and at other Technia offices

<table>
<thead>
<tr>
<th>Answer</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To a very great extent</td>
<td>36</td>
</tr>
<tr>
<td>2. To a great extent</td>
<td>47</td>
</tr>
<tr>
<td>3. To some extent</td>
<td>36</td>
</tr>
<tr>
<td>4. A little bit</td>
<td>7</td>
</tr>
<tr>
<td>5. Not at all</td>
<td>0</td>
</tr>
</tbody>
</table>
4. Technia's overall goals are well communicated

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To a very great extent</td>
<td>2</td>
</tr>
<tr>
<td>2. To a great extent</td>
<td>43</td>
</tr>
<tr>
<td>3. To some extent</td>
<td>55</td>
</tr>
<tr>
<td>4. A little bit</td>
<td>21</td>
</tr>
<tr>
<td>5. Not at all</td>
<td>5</td>
</tr>
</tbody>
</table>

How do you prefer these goals to be communicated?

5. How do you prefer personnel information to be communicated?

6. Today Ylva has info meetings every third month, this is:

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Too often</td>
<td>3</td>
</tr>
<tr>
<td>2. Just right</td>
<td>88</td>
</tr>
<tr>
<td>3. Too rarely</td>
<td>35</td>
</tr>
</tbody>
</table>

If not answering "just right", how often would you like them to be?

7. What kind of information would you like Ylva to provide at these meetings? (Choose several)

<table>
<thead>
<tr>
<th>Information</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Business Area info</td>
<td>80</td>
</tr>
<tr>
<td>2. Customer/project info</td>
<td>76</td>
</tr>
<tr>
<td>3. Strategic info</td>
<td>108</td>
</tr>
<tr>
<td>4. Numbers</td>
<td>77</td>
</tr>
<tr>
<td>5. How Technia is doing</td>
<td>115</td>
</tr>
</tbody>
</table>
6. If other, specify

**Comments (optional)**

<table>
<thead>
<tr>
<th>8. Running Technia University twice a year is a good idea</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Answers</strong></td>
</tr>
<tr>
<td>1. To a very great extent</td>
</tr>
<tr>
<td>2. To a great extent</td>
</tr>
<tr>
<td>3. To some extent</td>
</tr>
<tr>
<td>4. A little bit</td>
</tr>
<tr>
<td>5. Not at all</td>
</tr>
</tbody>
</table>

**Comments (optional)**

<table>
<thead>
<tr>
<th>9. Introducing an internal newsletter/newspaper is a good idea</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Answers</strong></td>
</tr>
<tr>
<td>1. To a very great extent</td>
</tr>
<tr>
<td>2. To a great extent</td>
</tr>
<tr>
<td>3. To some extent</td>
</tr>
<tr>
<td>4. A little bit</td>
</tr>
<tr>
<td>5. Not at all</td>
</tr>
</tbody>
</table>

**10. Technia's intranet is satisfying**

<table>
<thead>
<tr>
<th><strong>Answers</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To a very great extent</td>
</tr>
<tr>
<td>2. To a great extent</td>
</tr>
<tr>
<td>3. To some extent</td>
</tr>
<tr>
<td>4. A little bit</td>
</tr>
</tbody>
</table>
5. Not at all

What could make you visit our intranet more often?

11. What kind of information do you want to be published at an intranet? (Choose several)

<table>
<thead>
<tr>
<th>Answer</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guidelines and documents</td>
<td>105</td>
</tr>
<tr>
<td>Business Area info</td>
<td>96</td>
</tr>
<tr>
<td>Customer/project info</td>
<td>86</td>
</tr>
<tr>
<td>Strategic info</td>
<td>78</td>
</tr>
<tr>
<td>Numbers</td>
<td>63</td>
</tr>
<tr>
<td>Info about internal social activities</td>
<td>89</td>
</tr>
<tr>
<td>If other, specify</td>
<td>21</td>
</tr>
</tbody>
</table>

12. Jira is a vital tool in my daily work

<table>
<thead>
<tr>
<th>Answer</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>To a very great extent</td>
<td>24</td>
</tr>
<tr>
<td>To a great extent</td>
<td>25</td>
</tr>
<tr>
<td>To some extent</td>
<td>27</td>
</tr>
<tr>
<td>A little bit</td>
<td>38</td>
</tr>
<tr>
<td>What is Jira?</td>
<td>12</td>
</tr>
</tbody>
</table>

Describe how you're using Jira

13. A combined Jira and a traditional intranet is a good idea

<table>
<thead>
<tr>
<th>Answer</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>To a very great extent</td>
<td>20</td>
</tr>
<tr>
<td>To a great extent</td>
<td>31</td>
</tr>
</tbody>
</table>
3. To some extent

4. A little bit

5. Not at all

Comments (optional)

14. Do you have ideas or experiences from former employers' way of running internal communication that may be applied at Technia? If so on, describe how:

15. What is your opinion of Technia's internal social activities, (such us kick-offs, pubs etc.)?

16. Additional opinions regarding internal communication at Technia (optional)

17. Preferred size of hoodie

<table>
<thead>
<tr>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>XS</td>
</tr>
<tr>
<td>S</td>
</tr>
<tr>
<td>M</td>
</tr>
<tr>
<td>L</td>
</tr>
<tr>
<td>XL</td>
</tr>
<tr>
<td>XXL</td>
</tr>
</tbody>
</table>
12. APPENDIX IV INTERVIEW GUIDELINES

Intervjuämnen

Notera: Allmän information om intervjupersonen (namn, position, ålder, kön, antal år på företaget, etc.) hämtas ur en personaldatabas. Dessutom finns data från den tidigare genomförda enkäten (kortfattat om infobehov och wikianvändning) tillgänglig.

1. Presentation
   a. Bakgrund studien
   b. Användning av intervju
   c. Hur personer valts ut
   d. Anonymierson och inspelning
   e. Frågor innan intervjun?

2. Frågor
   a. Bakgrund, utbildning, IT vana, färdighet
   b. Kan du beskriva hur en typisk arbetsdag ser ut för dig? Exemplifiera
   c. Vilka samarbetar du med i ditt arbete?
   d. Hur går det till när ni arbetar ihop?
   e. Finns det några IT-verktyg som du använder i ditt dagliga arbete?
      i. Vilka/hur använder ni dem?
   f. Vilken kontakt har du med övriga delar av Technia? Exemplifiera
   g. Vilken information behöver du få från andra inom företaget?
   h. Hur får du tag på information från andra inom företaget?
   i. Hur skulle du vilja få tag på information från andra inom företaget?
   j. Vilken information har du som du tror att andra inom företaget kan ha nytta av?
   k. Hur delar du med dig av information som du tror att andra inom företaget skulle ha nytta av?
   l. Hur känner du att företagsinformation kommuniceras i dagsläget?
   m. Är du väl informerad om vad som föregår i företaget?
   n. Hur skulle du vilja att denna typ av information kommunicerades?
   o. Hur bra koll har du på ditt eget/andra företagsområden?
   p. Använder du dig av Technias Wiki som finns i Jira?
   q. Vad använder du Wikin till?
   r. Vad tycker du om Wikin?
   s. Vilken information hämtar du från Wikin och hur ofta?
   t. Vilken information har du lagt till i Wikin (om någon) och hur ofta?
   u. Har du redigerat artiklar andra har skrivit i Wikin och hur ofta?
k. Varför läser/läser du inte information som finns på Wikin?
l. Varför lägger du till/lägger du inte till information på Wikin?
m. Varför redigerar du/redigerar du inte information på Wikin?

n. Vad tror du om idén att Technia ska använda Wikin som sitt huvudsakliga verktyg för informationsspridning.
o. Vilka fördelar tror du Wikin har i jämförelse med andra system?
p. Vad skulle få dig att dela med dig av mer information genom Wikin?

q. Håller du med om något av följande nackdelar kring Wikin?
   i. Det finns en kostnad/arbete förknippat med att dela med sig till wikin
   ii. Information är ofta hemlig eller på annat sätt känslig att dela med sig av
   iii. Ovilja att dela med sig av ofärdigt arbete – man vill vara klar först
   iv. Man vill inte visa upp det som bara är ”halvbra” för alla kollegor
   v. Arbetsvanor – inte alltid lätt att ändra på
   vi. Människor vill inte behöva lära sig ett nytt verktyg
   vii. Man stöter inte på wikin naturligt/automatiskt i sitt arbete
   viii. Avsaknad av riktlinjer och standarder – vad ska man skriva där?
   ix. Jag vill inte att andra ska ändra ”mitt” innehåll
   x. Människor var rädda för att ändra innehåll som andra skapat

3. Avslutning
   a. Något att tilägga?
   b. Anonymisering och inspelning
   c. Tack!