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Collaborative Tools for Idea and Knowledge Management

A look behind the hypes

Master of Science Thesis in the Master Degree Programme, Product Development

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Göteborg, Sweden, 2011
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Abstract

This thesis addresses the emerging interest in Web 2.0 platforms. Based on several success stories such as Facebook, Wikipedia and MySpace these kinds of tools are finding their way into the workplace. The question that needs to be answered though is if the usage of these tools can deliver real value in a business context or if the use of these tools just is hype, based on exaggerated hopes. More specifically, this thesis addresses the question from an innovation perspective, with main focus on how idea and knowledge management can be improved.

Previous research has covered the need for collective ideation and stated the knowledge creation and sharing among individuals as crucial. Shared knowledge gives new combinations and results in ideas. Especially important in this creative process is a wide array of remote influences. Simultaneously several issues are presented regarding the way knowledge has been, and in many occasions still is, handled. Examples of main problems are found in that too much focus has been put on exploitation of knowledge rather than exploration which is seen as crucial for ideation. Furthermore there have been unsuccessful attempts to capture tacit knowledge, which contrary to explicit knowledge is dependent on context and human interpretation. The failure is due to a too high focus on IT-systems as one simultaneously has been overlooking the need for social networks.

In recent years new web-based tools, so called Web 2.0 platforms have been increasingly highlighted. These platforms, in a business context widely referred to as Enterprise 2.0, enable interaction and conversations between people that over time form networks. The platforms are also characterized by being focused on people, having almost all barriers to entry and participate removed, resulting in a bottom-up rather than top-down implementation. Typical examples of these tools are blogs, wikis, tagging, social search and idea management systems extended with discussion and rating possibilities.

Based on a case study of fifteen global companies, supported by secondary research, trends of the Web 2.0 evolvement have been compiled within this thesis. While the picture of how far companies have come in their exploitation of these tools is diverse, a number of the case companies have many platforms in use and are reporting substantial benefits. One of the most vital benefits is found in increased search speed, both for content and people. This will increase the possibilities to find experts, to create cross functional teams with a great array of competences, discuss and develop ideas and to increase your personal network, all affecting the ideation and innovation processes. Furthermore heavy users report gains in effectiveness by reduced e-mail traffic, reuse of shared material and easy access to know-how.

While some report great results, many are still struggling to get the sought values out of their platforms. This is many times due to poor management support and thereby an inability to reach the critical mass needed. Comparing the studied case companies with secondary research a consistent picture emerges of the need for top management support together with other key success factors as for example how to get the tools used in the daily workflow and how one needs to reward people with visibility in the organization. The thesis argues, based on the results some companies gain, that the usage of these tools are not just a hype but that one consequently must work with the implementation and cannot just leave it to faith.

Keywords: Enterprise 2.0, ideation, idea management, innovation, knowledge management, networks, Web 2.0.

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1. Introduction

To give an overview of this thesis, the first chapter of this report aims to provide an introduction of how the use of collaborative tools can support efforts intended to strengthen a company's innovation capability. Additionally this chapter will explain the specific aim as well as delimitations for the thesis. This is done in order to frame what results that are sought for and what value this thesis has for SCA in their continuous work of improvements.

1.1 Background

Companies of today are put under an ever-increasing competition (Flynn et al. 2003). A growing globalization, fragmented and demanding markets together with diverse and rapidly changing technologies are three major factors contributing to this situation (Wheelright & Clark 1992). The approach for organizations to meet the current competition, to maintain market shares, enhance product range and improve internal processes is to a high extent by the act of innovation (Flynn et al. 2003; Barsh et al. 2007; McAdam & Keogh 2004).

One fundamental part of innovation is the one of idea generation or ideation. This activity mostly takes place within the earliest phase of innovation, sometimes denoted as the fuzzy front end (Kim & Wilemon 2002). According to Zhang & Doll (2001), this part has a great impact on the innovation process as a whole. In attempts to respond to this, several companies have made use of suggestion boxes as according to Brem & Voigt (2007) are used to harness and capture the creativity of employees. Over time and by the support of IT, these suggestion boxes have evolved to more sophisticated idea management systems (Sandström & Björk 2010). Despite this fact, many companies are struggling with the predevelopment steps of their innovation efforts (Khurana & Rosenthal 1997). This reality gives incentives and highlights possibilities of strengthening not only the ideation process, but the whole innovation process as such.

When considering the idea generation within firms there has been a shift from observing ideation as a single activity to a larger, social collaborative action (Björk 2011; Tether 2002). As ideas beside creativity are a result of knowledge it makes sense that a greater amount of knowledge available through human collaboration will result in a higher amount of ideas of higher quality. In fact, the combination of knowledge and learning from others will enable ideation not yet possible by one person alone. The claimed gains of a collective approach to ideation, highlight an increasing need of networks and communication channels in order to share knowledge. These networks shall not be limited to an intra-organizational construction though, but as Chesbrough (2003) argues the focus on knowledge sharing should be widened far beyond company borders to enable what is denoted as open innovation.

The view of knowledge as important for innovation is nothing new, as knowledge management systems have been in place for many years, not solely but to a substantial extent for the purpose of innovation. A problem though is that most of these systems, in form of portals and intranets, have not been successful in capturing the output of knowledge workers, as being too centralized and leaving no traces of who has visited or used the information (McAfee 2006). Furthermore Swan et al. (1999) states that one has been too focused on exploitation rather than exploration as being crucial for knowledge sharing, learning and genuinely new ideas. Additionally when one has been focused on capturing and exploiting knowledge one has not taken into account that knowledge can be differently easy to exchange. While some knowledge may be explicit and easy to understand, there is knowledge that does not have much value if not put into a context and being processed by a sense-making dialogue

(Swan et al. 1999). This knowledge, denoted tacit knowledge, is less well suited to just be captured in a knowledge management system but is instead calling for network structures. According to Swan et al. (1999), IT-based systems may facilitate structural networks but do not encourage the social networking processes which are fundamental for communication and sense-making. All in all this has lead to that traditional knowledge management systems are being used to a very limited extent by today's knowledge workers (Davenport 2005).

Over the last years new web-based platforms, denoted Web 2.0 technologies, focused on collaborative authoring as blogs, wikis, discussion forums and social network communities have emerged. In a business context these platforms are widely referred to as Enterprise 2.0 (McAfee 2006; Tapscott 2006). The question is, if and in what aspects, these tools may handle knowledge and enhance the creative generation, sharing and combination of ideas in a fundamentally better way than traditional knowledge and idea management systems have done in the past. Regardless the answer, additional factors like companies being increasingly geographically spread and in need for emergent collaboration are calling for improved long distance communication, collaboration and sharing. This fact will ultimately most likely support the roll-out of the new kind of tools.

What the web 2.0 tools have in common is that they facilitate interaction and conversations between people resulting in network formations made up of digital relationships (Cook 2008). In addition Cook (2008) states that these tools are also focused on people, having almost all barriers to entry and participate removed, resulting in a bottom-up rather than top-down implementation. This pattern of a bottom-up approach is not the least likely to be supported by the explosive usage of collaborative social media in people's private life, especially among younger people as can be seen as the knowledge workers of tomorrow. Simultaneously this raises questions about what companies can do to favor this intrinsic urge of their employees.

As the development of Web 2.0 technologies and the Enterprise 2.0 is fairly new, it may be too early to see its full effect. This though, does not exclude the value of trying to evaluate what has been done so far, by whom, why and what the results are. Especially as many buzzwords are present around the Web 2.0 platforms in industry (Rollett et al. 2007). All in all this leads to an overlying curiosity regarding if Enterprise 2.0 to some extent just is a hype based on exaggerated thoughts or if the tools used at a private basis would fit and deliver value within a business context as well.

Focusing on SCA, continuous efforts are being made at looking into the possibilities of internal and external collaboration. The current evolvement of concepts as Open Innovation and the new Web 2.0 tools and platforms that emerge highlights possibilities of how the company can strengthen its innovation ability. SCA is responding to this by investigating different ways to improve their capability within the area of idea and knowledge management. At the moment a project is running in order to replace a 15 year old idea management system optimized for patent applications with an idea collaboration system intended to boost innovation within the company. When this is done and implemented (or perhaps simultaneously with this activity) SCA is addressing a further upgrading of their idea and knowledge management efforts. In this respect they are looking at *best practice* or even *next practice* in this area, which acts as the main incentive for this thesis to be made.

1.2 Purpose and Research Questions

The overlying aim for this thesis is to provide SCA with a solid basis for a decision of how to make use of collaborative tools in their next phase of the idea and knowledge management

efforts. Based on theoretical studies and investigations of how other large companies are utilizing collaborative (web 2.0) tools, this report more specifically intends to find an answer to the three research questions below.

- Which virtual collaborative tools are in use, at what stage of implementation are they and what strategic intents are found behind?

- What effects does usage of virtual collaborative tools have on a company's early phases of innovation, with main focus on idea and knowledge management?

- How are virtual collaborative tools implemented and what key questions must be addressed in order to reach success?

The answers to these questions give an overview of the current evolvement within the field which ultimately supports the aim to provide a basis to rely on and to give recommendations for SCA. Additionally the study enables a discussion of whether the new tools may solve previous and still existing problems regarding idea and knowledge management or not, as described in the first part of chapter three.

1.3 Scope

In addition to present the purpose and research questions for this thesis, there is a need to state some limitations to further clarify the scope of the project.

First of all regarding what tools that are considered within this study, they are to a large extent limited to collaborative tools based on Web 2.0 technologies in use within an Enterprise 2.0 context. In order to be able to put these tools in a context though, some smaller parts of this thesis will cover idea management systems as well as larger enterprise content management systems (ECM) or groupware. The underlying reason is found in that these systems in many cases act as the overlying structures which in Web 2.0 technologies are integrated.

While the thesis is intended to cover the tools and systems as clarified above, different technical aspects regarding programming or integration with existing IT-solutions are beyond the scope of the project. The tools are evaluated as types but no thorough investigation of what different producers or brands offer within a defined type of tools is done. Instead focus is put on how one from a managerial perspective in the best way can implement the tools, raise adoption and ultimately reach a beneficial usage.

Another key clarification is that the investigation of how collaborative tools can support idea and knowledge management is done with an overlying focus on how these areas support innovation. Idea management (a sub process of innovation management) is by Brem & Voigt (2007) stated to include the generation, evaluation and selection of ideas which also act as a limitation for this thesis. How ideas are handled beyond these stages, regarding funding and further investigations as later steps in the innovation process, is outside the scope.

When considering knowledge management it does not only effect and support innovation. Knowledge and how it is handled has fundamental impact on most of an organization’s activities, as marketing, production, businesses, etcetera. The main implications for this thesis are that while stating that it is focusing on collaborative tools for knowledge management there are several parts of knowledge management that to different extents fall outside the

scope of the project. No real distinct boundaries exist though, as the study aims to give a broad overview of collaborative tools, simultaneously as being characterized by an exploratory approach. Instead, the thesis is built on the direction of innovation as the ultimate driver without limiting the outcome in this complex area too much. A schematic clarification regarding how the different concepts are related to each other is presented in figure 1, which corresponding figure text aims to present what is covered and not in the thesis.

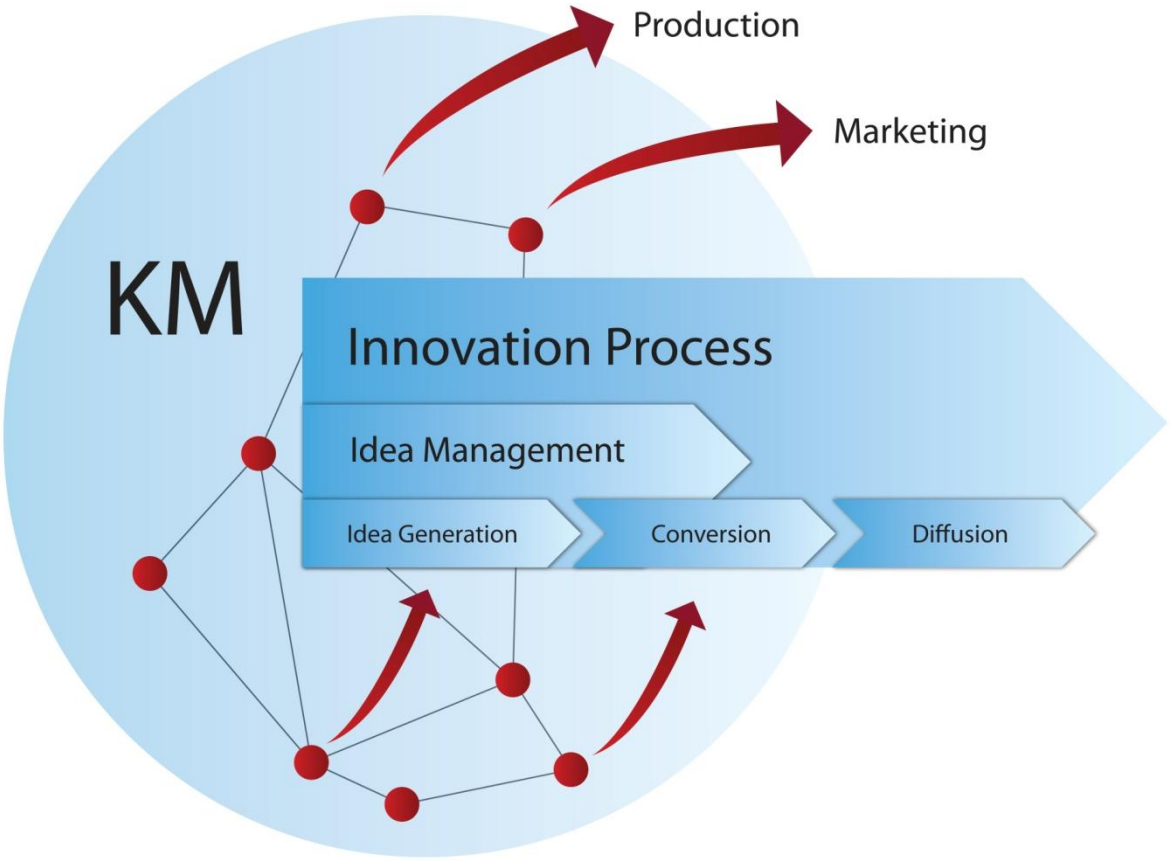


Figure 1: Based on an innovation model presented by Hansen & Birkinshaw (2007), including the phases of idea generation, conversion and diffusion this figure aims to provide clarification in how the concepts relate to each other. As this thesis, besides knowledge management, is limited to idea management not all phases of the innovation process is considered. The phase of conversion (selection, screening, funding) is only considered regarding selection and screening while the diffusion phase (realization and implementation) is not covered at all in this work. As stated in this chapter already, the area of knowledge management does besides supporting the innovation process by facilitating the phases of idea generation and conversion also have implications for several other activities as exemplified in the figure (production, marketing, etcetera).

A further clarification that calls for mentioning is that this thesis is written in a generic way, being applicable for any company interested in the questions the thesis aims to answer. With some minor exceptions, alignment with present status and initiatives at SCA are not addressed in this study.

1.4 Thesis Outline

The structure for this thesis follows a quite traditional pattern with seven main chapters, including the references. Additionally the used interview guide is presented in an appendix.

Introduction
This chapter gives a brief explanation of the evolvement within the field of collaborative tools and its connection to innovation. In addition the purpose and research questions of the thesis are given and existing delimitations are presented in order to give additional frames to the project.

Method
Within this part of the report the research approaches are presented and arguments given why certain methods have been chosen. Additionally the research sample is presented via a schematic description of the companies and the persons that have been interviewed.

Theoretical Framework
This chapter of the report has the role of presenting previous research within the field. Two main areas are covered. The first area describes how idea and knowledge management is related to innovation as well as limitations of previous ways of working within these areas. The second area covers what has been written about collaborative tools and how these can be used to improve the previous or current way of working with knowledge and ideation in order to support innovation. Not the least, the second area highlights different implementation and success factors that have been found in previous research.

Empirical Findings
Within the empirical findings a compilation of relevant descriptions of how other companies are working with these tools are given. The structure is chosen to suit the research questions rather than to give separate descriptions of how far each and every company has reached in their implementation and use.

Analysis and Discussion
In the analysis and discussion relevant theoretical and empirical data is connected and analyzed in order to give answers to the research questions. The main investigation covers how previous research regarding collaborative tools together with the empirical research within this study support each other or differ which ultimately gives the answers searched for.

Conclusions
Based on the analysis and discussion this chapter aims to summarize and present key insights in a clarifying way. Additionally, recommendations will be given of how SCA can benefit from the use of the investigated tools and how the corresponding work process and preceding implementation can be handled in a favorable way. Possible future research beyond this thesis is also presented.

References
The ending chapter of references includes all literature used. All used references in this report are presented based upon the Harvard System.

2. Method

This chapter aims to present how the study has been conducted. The used methods as well as what sources the thesis builds on are described. In addition several aspects that have affected the outcome of this thesis are highlighted.

2.1 Research Approach

The research approach that has been chosen for this thesis is of an exploratory character. According to McQuarrie (2006) this research strategy is appropriate when searching for discovery while the goal of a confirmatory strategy is rather to reach resolution. The distinction is absolutely crucial to achieve valuable insights and intended results (McQuarrie 2006). Accordingly this study is of a qualitative nature as in-depth thoughts and experiences are aimed for rather than quantitative proofs of questions that may not be adequate before exploring the area of virtual collaborative tools a bit further.

The main method used has been case studies, performed at 15 companies, with a complementary interview with a researcher within the area of collaborative tools. According to Yin (2009), case studies are suitable when answers are sought for questions as *how* and *when*. Eisenhardt (1989) states the case study to be a suitable research approach when little is known about a phenomenon and existing perspectives seem inadequate. Whether the literature for the use of Web 2.0 is inadequate or not, there are certainly a great amount of buzzwords surrounding the Web 2.0 platforms in industry as highlighted by (Rollett et al. 2007).

2.2 Data Collection

The data used for this study is based on an extensive literature review as well as elicited facts and opinions from the conducted interviews.

2.2.1 Literature Review

The starting point has been to frame the key concepts for this thesis, namely Web 2.0 platforms, idea management, knowledge management and innovation. As Web 2.0 platforms is a fairly new phenomenon, the literature review does not only aim to describe the platforms as such but also aims to put them into a context. Thereby the literature review in its first part goes through how idea and knowledge management relates to innovation and how all these concepts are benefitting from collaboration. Additionally what issues that have been experienced in the past are addressed in this section. In its second part the literature review explains how the field of virtual collaboration and especially Web 2.0 has emerged, what value it can give and to what issues it responds.

The literature consists of scientific articles, material from IT-analysts and consulting firms as well as management literature and a few selectively chosen blog posts written by established thought leaders. The literature used to describe concepts as innovation and idea and knowledge management is almost extensively based upon scientific articles. Regarding the descriptions of Web 2.0 platforms though, more lightweight literature has partly been used as the phenomenon is quite immature leading to that less scientific material is available.

2.2.2 Interviews

The empirical part of this case study is exclusively based on interviews, considered as one of the most important sources of case study information (Yin 2009). The fact that the research is characterized by a qualitative approach and covers a quite immature topic has implications on the population of interest. As the collaborative Web 2.0 platforms not yet are considered to be in widespread use in companies in general, a majority of the case study companies were

chosen based on knowledge that they were early adopters of these kinds of tools. Additionally, to be of value for SCA only companies of a certain size have been chosen for the thesis. Ultimately the study covers 15 international or global companies presented in the table below. In addition a complementary interview has been conducted with a researcher in the area. The number of case companies chosen is a result of a consideration. At one hand there is a need to investigate a sufficient number of companies to be able to see patterns and draw conclusions but on the other hand the number was limited by the available time for this study. The interviewees representing the different case studies are in most cases either directly working with or involved within functions where one makes use of these tools. Additionally the interviewees are predominantly working with innovation or knowledge management.

Table: This compilation includes the 15 (A-O) companies and the researcher (P), the case study is based on. Beside the company facts, given through type of company and size (in number of employees), the interviewees are presented.

Company	Type	Size (1000)	Interviewee
A	Global Manufacturing Company	<10	Research & Development Manager
B	Global Chemical Company	<10	Sales & Marketing Business Partner
C	Global Chemical Company	<10	Principle Scientist
D	Global Vehicle Research Company	<10 (50-100)	Innovation Project Portfolio Manager
E	Global High Technology Company	<10	Senior Business Strategy Manager
F	International Food Company	<10	Product Development Director
G	Global Manufacturing Company	10-50	Director
H	Global Consultancy Firm	10-50	Consultant
I	Global Food Company	10-50	Innovation Director
J	Global Manufacturing Company	10-50	Concept Manager
K	Global Energy Company	50-100	Knowledge Management Manager
L	Global Aerospace & Defense Group	50-100	Scientific Advisor & Technology Intelligence VP
M	Global High Technology Enterprise	50-100	Innovation Director
N	Global High Technology Enterprise	>100	1: Chief Technologist 2: Collaboration & Innovation SME
O	Global Consumer Goods Enterprise	>100	Innovation Leader
P	IT-University	-	Researcher

The interviews performed have in most cases been conducted over telephone, with exceptions for a few that have been taken place at the office of the interviewee being done face-to-face. With one exception, only one person at each company has been interviewed. The interviews have been characterized by a semi structured approach where an interview guide with open ended questions, presented in the appendix, has served to guide the interview in the right direction rather than to request answers on specific questions. All interviews performed have, based upon approval from the interviewee, been recorded and then afterwards transcribed before the data have been analyzed.

2.3 Reliability and Validity

According to Yin (2009) a key criterion for judging the quality of an empirical research is to ensure the outcome to be both reliable and valid. According to Kirk & Miller (1986) reliability covers to which extent a measurement procedure will result in the same answer independent on however and whenever it is carried out. Validity on its hand deals with to what extent the research gives the correct answer (Kirk & Miller 1986). Regarding the reliability aspect of this thesis, a limitation must be mentioned. As the interviews have been characterized by a semi-structured approach the result is dependent on the particular conversation that occurred during that special occasion. While all interviews have been guided to cover the answers searched for, one cannot neglect that the outcome in detail cannot be seen as repeatable as the social interaction during an interview is not static. Simultaneously this limitation does not have any major effects on the thesis as the aim is to elicit an overview of company situations rather than very specific measurements.

When considering validity, great effort has been made to carefully transform the transcribed interviews into the chapter of empirical findings. In addition, complementary follow-up interviews have been conducted with some interviewees to straighten out question marks or to ask additional questions that did not get covered in the original interview, the latter strengthening the reliability. Still it is important to state that when, in all cases but one, only interviewing one person in each case company the answers will be affected by the personal bias and interest of the interviewee. People define and refer to tools differently, as well as focusing on what is the most valuable for themselves. Consequently the given answers do not necessarily give the perfect picture of each company. As this study does not specifically aim to compare the investigated case companies but rather compile overlying patterns of usage this is not a major issue.

3. Theoretical Framework

This chapter will give a broad background by theoretically presenting the role of collaborative tools regarding knowledge and idea management. To start with, an explanation of how idea and knowledge management relates to innovation will be given, followed by a presentation of perceived limitations of existing and previous attempts to manage knowledge and ideas. The different collaborative tools that are emerging will be covered in the second part of this chapter, where they will be described in detail as well as it will be explained how they can solve several problems of the past. In order to provide additional value, a compilation of implementation and success factors will end up the chapter.

3.1 Innovation

As stated in the introduction, companies of today are put under an intense, global and growing competition which they have to address by focusing on innovation (Flynn et al. 2003; Barsh et al. 2007; McAdam & Keogh 2004). But what is an innovation? The literature in the field of innovation is extensive but to some extent also fragmented (Smith et al. 2008). This has resulted in that a number of definitions exist. According to Van de Ven (1986), innovation can be described as the process of developing and implementing upcoming ideas. Another definition is the one of looking at innovation as a process of turning opportunity into new ideas which are taken further into a widely used practice (Tidd et al. 2001).

Besides defining an innovation as such, there are also different notations on what types of innovation that exist. Usually one distinguishes between incremental and radical (or breakthrough) innovation, depending on the leap of technological or market change. An incremental innovation usually provides new features or improvements to an existing technology or market (Garcia & Calantone 2001). A radical innovation leads to discontinuities, not usually being a response to a demand but instead creating one by initiating new technology or markets. Still though, Garcia & Calantone (2001) highlight that the typology is a relative concept, depending on the firm or person behind the innovation. A third type of innovation defined by Garcia & Calantone (2001) is something denoted as a really new innovation which can be positioned between the incremental and radical or breakthrough innovation.

Within a model presented by Hansen & Birkinshaw (2007), innovation is recommended to be looked upon as a value chain including the three phases of idea generation, conversion and finally diffusion. The first phase of idea generation is intended to bring out new ideas which can be done internally in small units as well as across the company but also by interaction with external players. The second phase of conversion includes the activities of selection and screening of ideas as well as the funding of promising ones to take initial steps in transforming ideas into results. At last, a dissemination of the developed ideas across the organization is intended within the phase of diffusion.

An important learning from the model is that all phases are equally important for an innovation to succeed. This can easily be understood as without ideas, there will be nothing to convert but without a good conversion or diffusion process it does not matter how good or how many the ideas are (Hansen & Birkinshaw 2007). As this thesis will focus on ideas and the knowledge behind, it has the implication that only the earliest phases of the value chain will be of interest as already stated in chapter 1.3.

3.1.1 Ideas and their Origin

Considering the generation of ideas, as of main interest for this study, it is to a high extent an act within the beginning of the innovation process as already stated. This initial phase of innovation is often referred to as the fuzzy front end (Kim & Wilemon 2002). Still though one should have in mind that despite the linear models of the innovation process as presented, ideas are to some extent generated, developed and combined along the process. Hargadon & Sutton (1997) highlights how the emergence of new connections between people and different groups result in that ideas are combined and developed as well as new ones are fostered.

According to Björk (2011) one can see a shift where companies are extending their idea generation or ideation efforts beyond the usage of suggestion boxes by applying a more proactive approach to idea generation. This trend includes the use of several different sources for capturing ideas. According to Hansen & Birkinshaw (2007) ideas can have many origins both within and outside the organization. Cooper & Edgett (2009) distinguishes the following six general categories; voice-of-customer methods (VOC), open innovation methods, internal idea capturing, patent mapping, peripheral vision and disruptive technologies. Out of these methods different voice-of-customer methods were considered the most effective, despite some of them were not widely used (based on a study of 18 different sources). Most widespread among companies was internal idea capturing, though relatively ineffective. According to Cooper & Edgett (2009) the internal idea capturing is often restrained by insufficient systems and a lack of direction as well as an outspoken strategy of ideas needed.

A trend during recent years has been the focus on, and interest in, open innovation. Chesbrough (2003) states that the internal focus on innovation must be broadened far beyond company borders, in the new era of open innovation, and that internal idea creation miss out a huge potential by using a more closed model. The fact is that this is the case for numerous companies. Hansen & Birkinshaw (2007) states that many companies miss out the potential to acquire new knowledge and ideas from external sources. This makes business networking important, as it is of great concern in the innovativeness capabilities (Pittaway et al. 2004). According to Lindegaard (2010), open innovation has just got started and is riding on two big trends. The first one is that innovation has become global, making it logical to open up the innovation process to external partners as a next step. The second trend is that knowledge is becoming increasingly accessible and transparent, making it easier to innovate across barriers.

Despite all that has been written, Cooper & Edgett (2009) find in their study that correspondents neither find the open innovation concepts very popular nor effective. To have in mind though is that the concepts are relatively new, and it may be too early to evaluate the methods (Cooper & Edgett 2009). According to Trott & Hartmann (2009), the focus on open innovation is nothing but new notations of a far back reaching understanding of the need to make use of external sources in the innovation process. One such source, stressed by Von Hippel (1989), is the importance of customer involvement and especially the potential seen in lead users.

3.1.2 Knowledge and Collective Idea Generation

To enable innovations one must regard knowledge as top priority (Howells 2002; Tapscott 2006), as knowledge is a necessity for the generation of ideas (Kim & Wilemon 2002). The act of innovation, invention or discovery does not only involve the usage of existing knowledge though, but usually also the acquisition of new knowledge by learning (Howells 2002). One should also mention that knowledge is more than information. The transformation from information to knowledge occurs when someone reads, understands and interprets

information in order to apply it in a work function (Marshall 1997). This results in that what may be knowledge for one person can be information for someone else.

Sharing knowledge is not possible through a one way channel. The transfer of knowledge must be based on some kind of shared common understanding or shared reference frame (Swan et al. 1999). Shared learning and the mutual exchange of knowledge for innovation makes knowledge a social constructed process (Berger & Luckmann 1966), dependent on collaboration (Tapscott 2006). If seen in an extended perspective, this also makes the ideation a collective action. An idea is certainly the result of individuals, but the development and combination of ideas is at the same time to a large extent dependent on cooperation and collaboration (Nonaka 1994). According to Björk (2011); Tether (2002), this has led to a shift from looking at ideation as individual contributions to a collective process.

Despite former notions of lone inventors as being crucial, especially for breakthrough ideas, collaborative ideation based on a multidisciplinary constitution gives breakthroughs (as well as failures) at a higher pace (Flemming 2007). The result is, in spite of the failures, an increased amount of valuable ideas. A less diverse constitution of collaborating partners will also produce ideas at high pace but the result will be characterized by incremental ideas as well as less failures. The advantages of collaboration for ideas are in line with what Surowiecki (2004) denotes "Wisdom of Crowds", including the concept of the masses being wiser than the experts given that certain criteria are satisfied.

Beside theoretical and empirical evidence for knowledge sharing and collaboration as being crucial for ideation in general, there are reasons found in the current industrial evolvement that contributes. One such reason behind a growing collective approach could be the increased complexity of products and services of today. Teams with a diversity of knowledge are needed to accomplish what would not be possible by individuals themselves (Jackson 1996). The globalization of organizations is another reason, where Swan et al. (1999) highlights the importance of knowledge sharing between heterogenic and geographically spread units and individuals.

3.1.3 Limitations of Previous Knowledge Management Systems

In order to handle knowledge and enable sharing and learning amongst the organizations' employees, IT-based Knowledge Management systems have evolved throughout the years. When the field of Knowledge Management boomed within literature in late 1990's, a predominant focus was put on IT-based Knowledge Management Systems (Swan et al. 1999). In a survey by Davenport (2005) though, regarding different media used by knowledge workers, knowledge management systems did not even show up. This shall be seen in the light that the innovation processes have become increasingly interactive (Swan et al. 1999), making the handling and exchange of knowledge ever as important. Clearly this gives birth to a number of questions in which way previous IT-based knowledge management systems have failed. By answering these questions new approaches for knowledge management can be found that can solve the numerous problems that have been connected with earlier attempts to manage knowledge.

McAfee (2006) distinguishes two kinds of information technologies used by knowledge workers, namely channels and platforms. Channels, like e-mails and instant messaging, fails in the aspects that very few can see what is being done. Only the ones that are involved in the conversation, maybe only two persons, are affected and can keep track of the progress. Platforms, like intranet and information portals, are what can be considered as more

traditional knowledge management systems. According to McAfee (2006), these technologies have failed in being too centralized, leaving no traces of who has visited or used information, and simultaneously being too bad at capturing the output of knowledge workers. Cook (2008) argues that channels and platforms are as polarized as anything can be. Where channels allow anyone to create but is consumed by very few, the platforms contain information that is created by few but available to the whole organization. Hinchcliffe (2007) gives his view of these issues and highlights that neither did intranets, portals, most groupware, e-mail nor classic instant messaging of the past provide access to a voice for employees to communicate and collaborate. Neither were the results globally visible. Related to bad visibility is the fact highlighted by McAfee (2006) that search functions for internal IT-systems in general are really bad.

To understand more in detail why previous knowledge management systems have not been truly successful one must go beyond IT-tools and systems and instead highlight that not all knowledge is easy to exchange. Some knowledge is really hard to communicate or make explicit to someone else, so called tacit knowledge (Polanyi 1966; Nonaka 1994). While explicit knowledge is easy to share in formal and transmittable languages, tacit knowledge has a personal quality which is hard to formalize and communicate to others (Nonaka 1994). This results in that tacit knowledge, as being dependent on its context and rooted in action and sense-making, is hard to capture within a traditional knowledge management system. Tredinnick (2006) states that knowledge management where one thinks that explicit knowledge just can be put in a database makes the knowledge independent of the individual who possess it. This has lead to that many attempts to codify tacit knowledge may not result in anything else than knowledge being useless as it is too difficult to explain, as well as it may be redundant, irrelevant or inaccurate (Swan et al. 1999). On the other hand, only capturing explicit knowledge will severely limit the contribution to innovation as tacit knowledge is of main value for ideation and thereby in an extended perspective also innovation (Swan et al. 1999; Howells 2002). According to Johannessen (2008) a key factor in creating knowledge for innovation is to organize a process that makes knowledge which is hard to communicate understood by the people involved. All in all, previous knowledge management systems have not been good at capturing valuable knowledge (McAfee 2006).

An issue related to the discussion of the difficulties to communicate knowledge is linked to the characteristics of the initial fuzzy front end of innovation. This phase deals with a great uncertainty (Kim & Wilemon 2002). According to Björk (2011) many methods and tools are not adjusted to this. The result is that too formalized methods and tools make it even harder to share deeply tacit knowledge between employees. Also, intranets and knowledge management systems many times reflect the preferred role of itself as knowledge and expertise are filtered through embedded management processes within the systems (Tredinnick 2006). The knowledge and expertise that emerge from actual work, as when solutions are created, the generation of ideas, sharing of skills and experiences as well as collaborative work in general are not captured in a valuable form which results in a low learning potential.

Another problem with knowledge management has been that it has been too focused on exploitation rather than exploration (Swan et al. 1999). Many knowledge management efforts have only dealt with the transmission and storage of knowledge looking upon knowledge as a finite resource (Tapscott 2006). Storage and exploitation may be necessary to prevent that things may be invented several times, but according to Swan et al. (1999) it is the exploration through knowledge sharing that enables knowledge creation and gives incentives for genuinely new ideas. Central is that knowledge must be seen as an infinite resource that can

be increased by collaboration (Tapscott 2006). According to Nonaka (1994) one must leave the passive and static paradigm of information processing conceptualizing the organization as something that only processes information or solves problems. Instead one needs to create and define new problems and then actively develop new knowledge to solve them.

Furthermore, even where knowledge may be codified, stored and broadcasted it is not certain that this knowledge will be used and applied by someone else (Swan et al. 1999). A supply driven approach as dominating for previous IT-solutions may just lead to the major problem of information overload, as experienced by many managers. Besides, the existence of knowledge does not automatically lead to collaboration. Initiatives that instead are demand driven are more likely to be concerned with the creation and application of knowledge in innovation processes (Swan et al.1999).

3.1.4 The Effect of Networks

In order to manage knowledge sharing in a better way than previously has been done, one must highlight the role of networks. According to Tapscott 2006, these networks are a prerequisite for enabling collaboration. Through the social communication process of networking, the sharing of knowledge is encouraged (Swan et al. 1999). Kim & Wilemon (2002) argues that knowledge networks are essential to improve the ideation process, where the informal community of social interaction is crucial for the new ideas to emerge (Nonaka 1994).

The problems with previous efforts to manage knowledge, described in chapter 3.1.3, is to a high extent due to a too high reliance on that knowledge management has to do with IT systems. These IT systems have been able to create structural networks but do not encourage the importance of social networking, as of main importance in increasingly interactive innovation processes. According to Swan et al. (1999) face-to face communication is the most central as deeply tacit knowledge is hard, if at all possible, to transmit in other ways. Hand in hand goes that people management is more important for knowledge sharing than the use of IT-systems. The risk of installing network links is that it reduces rather than increases knowledge sharing as they may undermine social networking. Instead Knowledge Management must be focused on active networking and the creation of network structure by encouraging the active personal networking that is needed. (Swan et al. 1999)

If a network structure is created in a way that supports active networking and social interaction it can enable former problems associated with knowledge management to have a solution. Tacit knowledge can be transferred more easily by the negotiation and sense making that the networking enables (Swan et al. 1999). The transfer is not the least strengthened by the possibility of dialogue, by Nonaka & Toyama (2005) denoted as key prerequisite for making tacit knowledge explicit. For this dialogue to take place Nonaka & Toyama (2005) introduce the concept of *ba*, (a Japanese denotion for place). *Ba* is not only a physical space but rather includes the contexts and meanings that are shared and created through interactions that occur at a specific time and space. Nonaka & Toyama (2005) defines *ba* as shared context in motion. *Ba* can emerge in individuals, project teams, temporary meetings, virtual spaces as well as email groups.

The concept of *ba* and the possibility for dialogue is not only vital for knowledge transfer but can also be seen as the foundation of knowledge creating activity. Thereby former problems of exploitation rather than exploration and new knowledge creation can find solutions via social networking activities and the upcoming dialogues. According to Swan et al. (1999) a

shift towards social networking strengthens the core of effective use of knowledge for innovation by linking geographically spread groups enabling effective knowledge transfer beyond functional and organizational boundaries.

Finally one should mention that social networks can have different tie strength as shown in figure 2, leading to different characteristics. Strong ties enable a cohesive collaboration where smaller groups of employees are knit together in a way that is beneficial for knowledge sharing (Kogut 2000; Flemming 2007). Weak links on the other hand gives increased diversity of influences which is valuable for creativity as discussed in the following chapter, 3.1.5. With absence of ties, both strong and weak, a structural hole occurs (McAfee 2009). These holes are a problem for organizations as they prevent information from flowing. Simultaneously they provide an opportunity for individuals to act as brokers by spanning links over the structural hole and thereby experience advantages by controlling information (McAfee 2009).

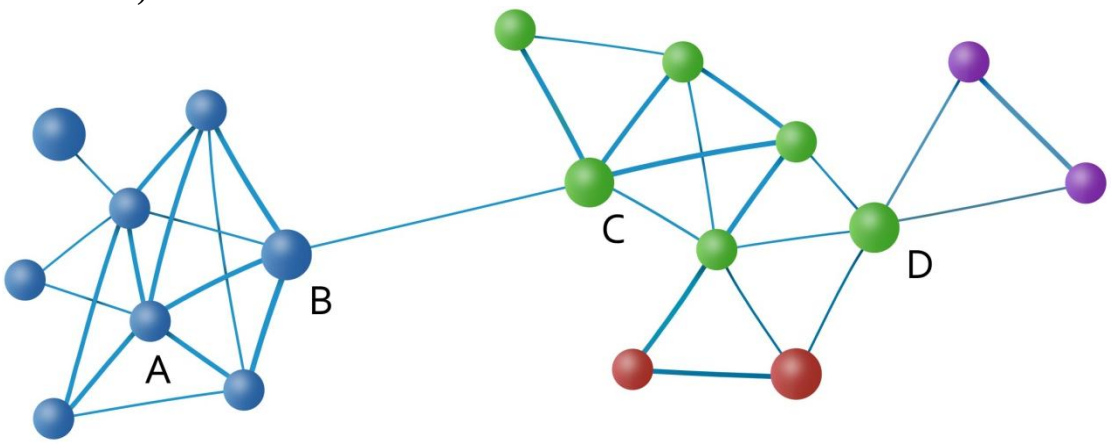


Figure 2: This picture shows how the individuals represented as B and C are brokers over what otherwise had been a structural hole. While individual A is affected by strong ties within a closed working group, individual D gets influences by weak links connecting to other groups.

3.1.5 The Role of Creativity for Ideation

Besides knowledge, employee creativity makes a substantial contribution to organizational innovation by fostering good ideas (Amabile et al. 1996). Whereas innovation transforms a new idea into a new product, service or an organizational improvement, creativity in general is the production of new ideas or the combining of old ideas into new ones (Heye 2006). In the previous chapters arguments for the importance of collaboration and networking for knowledge sharing and creation has been highlighted. Collaboration and networking is a prerequisite for high creativity as well. Social interaction and influence of others strengthen creativity well above what is the result of lonesome periods of thinking (Montuori & Purser 1995; Perry-Smith & Shally 2003). This is because of that influences from others give a cognitive stimulation which enables the possibility to see connections and make associations not otherwise being possible (Madjar 2005). The social environment can influence both the level and the frequency of creative behavior (Amabile et al. 1996).

According to Madjar (2005) it is important to find the social connections that enable the right valuable impulses for increased creativity. In addition the connection to individuals in different groups has a diverse effect on the creativity (Madjar 2005). For example work-related persons outside the business unit or department are likely to provide remote facts and perspectives that effect creativity stronger than inputs from work-related persons within more familiar surroundings. In addition non work-related persons provide remote ties that may

come with even more unique perspectives and ideas able to foster high creativity and totally new ideas. An aspect important to highlight is that a large number of weak ties give many impulses without any of them being too dominant, which is the core of creativity (Perry-Smith & Shally 2003). Strong ties on its own hand can hinder creativity by too heavy influences locking the possibilities to objectively regard other sources (Madjar 2005). Exposure from weak ties leads instead to no redundancy and high degree of heterogeneity (Perry-Smith 2006)

Besides cognitive stimulation as a key for creativity the importance of a good mood shall not be neglected (Madjar 2005). A good mood is crucial for creativeness and is affected by one employee's surroundings. Thereby the social environment, both work and non-work related is important not only for giving cognitive stimuli but also for encouragement and support. A related aspect is that it is important to feel acceptance for creativeness and new ideas as they may challenge existing thoughts and point of views (Madjar 2005).

3.1.6 Idea Management

According to Vandenbosch et al. (2006), two research streams in management and organization studies address ideas explicitly, namely creativity and innovation. Still there is a need to handle ideas and idea generation in an own field (Vandenbosch et al. 2006). According to Brem & Voigt (2007), idea management can be seen as a sub process of innovation management with the aim to handle idea generation, evaluation and selection in an effective and efficient way. Vandenbosch et al. (2006) defines the concept of idea management in a similar way by describing it as the process of recognizing the need for ideas as well as the generation and evaluation of them.

As stated in chapter 3.1.1, ideas can origin from several sources. Regarding internal idea generation, by Cooper & Edgett (2009) denoted to be the source giving the most ideas, Lindegaard (2010) argues for short idea generation sessions as time within today's business is crucial. While Paulus and Yang (2000) highlights previous research stating loss in productivity by using brainstorming sessions instead of having people working on ideas in isolation, they conclude that brainstorming is valuable if certain criteria are fulfilled. To be effective the participants need to be focused on shared ideas and have time to reflect on them.

A relevant question is what to do with the ideas. As Lindegaard (2010) states, it is important to have a high amount of ideas but it is worth nothing if you do not have a fast effective process that can winnow the great numbers down to some really good ones to go for. One way to not only capture the ideas of the employees but also being able to evaluate them is by making use of an idea management system. According to (Sandström & Björk 2010), these systems originate from the suggestion boxes that over time has been developed to become more sophisticated. According to Lindegaard (2010) many companies are lacking this kind of platform. The typical design of these systems is an idea box where ideas can be received and stored, as well as complementary possibilities to share, discuss and rate the ideas. Crucial with these systems according to Lindegaard (2010) is to follow up the idea submitters, give feedback and have an ongoing communication with them.

A critical success factor is then how to connect the idea management to the overlying innovation process. Before having ideas captured in a system one needs to figure out how to realize the ideas in the end. According to Lindegaard (2010) it is crucial to localize what is denotes as grade A people. These are individuals that can drive innovation further beyond idea management to the next step towards innovation.

3.2 Virtual Collaboration

A growing availability of new Information and Communication Technology (ICT) makes it possible to address issues of the past (Corso et al. 2008a). Especially the evolvement within the web during recent years has come to change how people work and even more how they will work from now on. Historically hierarchically corporations are influenced by the success stories as Myspace, flickr, Facebook, YouTube etcetera, where the values of mass collaboration are harnessed (Tapscott & Williams 2006). What Tapscott & Williams (2006) denotes wikinomics, is a paradigm built up by the principles of being open, peering, sharing and acting globally. New tools for collaboration will enable a transformation about knowledge and science into an increasingly open and collaborative environment that will accelerate discovery and learning (Tapscott & Williams 2010). The result will be that corporations by handling knowledge in a better way also dramatically will increase their capability to innovate and create value (Tapscott & Williams 2006).

The way collaborative innovation moves on to the next level, is by using the web for participation rather than as before when the web was used for passively receiving information (Tapscott & Williams 2006; Oberhelman 2007). Murugesan (2007) supports this view by describing the new Web, denoted Web 2.0, as more dynamic and interactive than the preceding Web 1.0. Web 2.0 is both a usage and technology paradigm, consisting of a collection of technologies, businesses, strategies and social trends (Murugesan 2007). The Web 2.0 as a concept originates from a conference brainstorming session between O'Reilly and MediaLive International (McAfee 2009). Fundamental for the Web 2.0 is to look at the web as a platform (O'Reilly 2007). What this means is that Web 2.0 tools are enablers rather than the essence itself which rather is the communication and collaboration that is channeled through (Levy 2009). Non-technological trends of Web 2.0 are also worth mentioning. Control is moving towards the end users and trust and authentication of information resources are key aspects of the concept (Tredinnick 2006).

No hard boundaries really exist about what defines Web 2.0 but as O'Reilly (2007) sees it, rather a gravitational core where focus is put on harnessing the collective intelligence and network effects. In similar words Web 2.0 can be characterized by what is denoted *the long tail* (Tredinnick 2006). This concept has its origin in statistics were it is used to describe the very slow decline after initial sharp drops (Rollett et al. 2007). Regarding knowledge the long tail can be looked upon as a few items heavily used but a great amount of items hardly used at all and thereby difficult to access. The use of Web 2.0 platforms addresses this problem as the web enables the items building up the long tail to be dramatically more accessible (Tredinnick 2006). Ultimately it is possible to conclude that where traditional computer applications became slower and slower the more people that were using them, Web 2.0 works the other way around (Bradburry 2007). The more people that use it, the more effective is the technique.

In a company context, focusing on these Web 2.0 tools and platforms that can be used organizationally, the term Enterprise 2.0 is used (McAfee 2006). A corresponding denotation for the Enterprise 2.0 is the Open, Networked Enterprise (Tapscott 2006). This denotation also encompasses that besides networks being crucial for collaboration, businesses also are in need of openness. According to McAfee (2009) Enterprise 2.0 is defined as; *the use of emergent social software platforms by organizations in pursuit of their goals*. Social software can be seen as platforms that facilitate interaction and communication between people and thereby provide digital networks to exist (Cook 2008). Such platforms are for example; blogs,

wikis, social bookmarking, mashups, etcetera that are referred to as Web 2.0 tools in a more general view.

Rangaswami (2006) highlights that Enterprise 2.0 delivering advantages in being lightweight with minimal need for system and maintenance resources as well as being easy to use by simple interfaces. Just the ease of use and creation is supported by McAfee (2006) as one of the most important aspects of Enterprise 2.0. In addition Enterprise 2.0 benefits from quick adoption and an easy integration, not the least by on demand and service based applications that hold vendors responsive (Rangaswami 2006). As a result, Hinchcliffe (2007) argues that new collaboration emerge that will enhance creativity, cross pollination and innovation.

Empirical evidence can now be found in that for example the intranet of many firms radically has changed its role (Corso et al. 2008b). From being a predominantly static top-down channel for communication and information to being transformed to a new open and working environment that is creative, focused on the users and their needs for interaction with others (Tapscott 2006; Corso et al. 2008b). According to McAfee (2006), this is a profound shift where predefined structures with lack of flexibility are replaced by user defined structures that can shift over time. This enables for example valuable communities to emerge and grow over time without guidance from above. The shift towards self organization does not call for a replacement of all older intranets and knowledge management systems though. Instead they can coexist with standalone as well as integrated Enterprise 2.0 initiatives. For some purposes more mature heavyweight IT-systems may still be better suited (Hinchcliffe 2007). In addition Hinchcliffe (2007) states that existing intranets and portals rather can be unburdened than put into conflict with the new tools, as communication over e-mail traffic and collaboration within enterprise content management systems may move to Enterprise 2.0 platforms.

Measurable effects on the business are now also seen by heavy users of Web 2.0 as a result of better knowledge sharing and more effective marketing (Bughin et al. 2009). The adoption pattern of Web 2.0 applications within companies seems to follow those of earlier eras, a typical S-curve. Early adopters learn to use the new technology which shows the value for others and the adoption picks up rapidly (Bughin & Chui 2010). This is what currently is happening and based on McKinsey's annual surveys regarding the use of Web 2.0 within enterprises it seems that benefits will show faster than expected (Bughin & Chui 2010).

As success stories will continue to emerge, Hinchcliffe (2007) points out that issues as information spill, intellectual property thefts and other problems will come up when so much critical business information will be more accessible. Despite early signs of value some critique or deliberateness also exists, not the least with the recollection of the dot.com bubble in 2001. Davenport (2007) questions if the technology itself will empower employees, decentralize decisions, free up knowledge etcetera. An argument is that the lack of participative technologies in the past cannot be the only reasons behind the formal and hierarchical organizations that exist. According to Davenport (2007) the Web 2.0 tools will not be able to address barriers that prevent knowledge to flow freely as power differentials, lack of trust, missing incentives, unsupportive culture and the general busyness of employees today.

Undoubtedly there are many buzzwords surrounding many of the Web 2.0 applications in industry (Rollett et al. 2007). The question is if the use of Web 2.0 in an industrial context, as referred to Enterprise 2.0, to some extent just is a hype or what true values that exist behind everything that has been written? The question is especially valid having in mind that Swan et

al. (1999) some ten years back in time highlighted an overoptimistic belief in IT regarding knowledge management. One shall have in mind though that Swan et al. (1999) suggested that IT should be focused on encouraging active networking.

3.2.1 The Role and Effects of Enterprise 2.0

Undoubtedly a strong evolvement of the Web is currently taking place and success stories based on virtual collaboration are easy to find. Still, taking the Web 2.0 applications into a company context within the Enterprise 2.0 give birth to the question of what issues the concept tries to respond to, if one looks beyond the general focus of virtual collaboration. Based on a compilation of well-reputed literature, Corso et al. (2008a) states that Enterprise 2.0 responds to six key dimensions, namely open belonging, social networking, knowledge networks, emergent collaboration, adaptive reconfigureability and global mobility. This is done by a set of organizational and technological approaches that ultimately aims to support new features and needs of people to boost flexibility, adaptability and innovation (Corso et al. 2008a).

- Open belonging encompass the aspects of an increasingly rich interaction within supply chains, communicating with suppliers, consultants, partners and customers (Corso et al. 2008a). As the companies become more open and networked the external collaboration processes must be addressed (Tapscott 2006). By the use of Enterprise 2.0 technologies, possibilities to go beyond company boundaries are supported (Corso et al. 2008a). One example of how Enterprise 2.0 possibilities are harnessed is by broadcast search, where questions can be posted to the big masses through for example a clearinghouse as exemplified by the profit venture *Innocentive* (McAfee 2009).

- The need for social networking is strengthened by the ease of mapping persons that possess valuable knowledge in order to reach people of interest with speed and validity (Corso et al. 2008a). Web-based telephone books, social presence updates and social network applications not only enable an easier way to connect to experts within the organization but outside as well. Different tools are differently well suited for different networks where Facebook-like applications can be beneficial for networks constituting of weaker ties simultaneous as wikis may be preferred for collaboration between people with stronger ties. New software platforms also allow people to span over structural holes and thereby establish connections to all those potential but not yet exploited possibilities that exist (McAfee 2009).

- Knowledge networks as a key for many organizational processes are responded to by tools for explicit knowledge transfer as document management systems, business intelligence, video sharing, podcasting, RSS etcetera. As a more direct response to previous problems regarding tacit knowledge, new transfer tools ease the interaction between experts. Examples found in forums, mailing lists, blogs, folksonomies, wikis etcetera are now present within the Enterprise 2.0. (Dearstyne 2007; Corso et al. 2008a)

- Emergent collaboration as a result of increased competitive and unpredictable environment can be addressed by Enterprise 2.0 as it enables both synchronous (instant messaging and video conferences) as well as asynchronous (diary sharing and co-editing of work documents) tools. This helps to overcome geographical time

barriers (Corso et al. 2008a). A key for emergent collaboration is the group editing that is enabled by Enterprise 2.0 platforms (McAfee 2009).

- Adaptive reconfigureability is needed for adjustments in line with endless changes occurring in policies and strategies in today's businesses. Technologies as mashups, RSS etcetera enable a flexible and dynamic approach to these issues (Corso et al. 2008a).

- Finally, global mobility defined as spending time out of office and rather frequently being out travelling can be addressed by new Enterprise 2.0 tools enabling connection any time of the day (Corso et al. 2008a). This is not the least possible due to increasingly advanced mobile phones giving access to the emerging Web 2.0 platforms.

Obviously different companies within diverse businesses have different needs to respond to and thereby choose to prioritize differently among the six key dimensions described above. Attempts to classify different companies have been made though. A compilation by Corso at al. (2008a) of 70 case studies, a survey of 65 CIO and a community discussion with experts show that a *social enterprise model* aiming to create new collaboration, knowledge sharing and relationship models seems to be the most widely in use (24 percent). Additionally Corso et al. (2008) group some companies (14 percent) within an *open enterprise model* trying to extend their virtual workspace boundaries in order to include external players. Some other companies (14 percent) are grouped into an *adaptive enterprise model* focused on flexibility and reconfigurability regarding corporate process management. An important notation is that not all companies, as seen when adding the percentages, are possible to group within these models.

According to a study performed by McKinsey 2010, based on responses from 3249 executives across a wide array of regions and industries, a large majority of companies receive measureable beneficial results by using Web 2.0 applications (Bughin & Chui 2010). For internal purposes 77 percent see an increased speed of accessing knowledge, 60 percent experience reduced communication costs and 52 percent point out an increased speed of access to internal experts. Additional benefits are increased satisfaction among employees (41 percent) and an increased number of successful innovations (28 percent). Regarding customer related purposes 63 percent of the respondents see increased effectiveness of marketing, 50 percent experience increased customer satisfaction and 45 percent highlight reduced marketing costs. Finally when it comes to working with external partners and suppliers 57 percent enjoy measurable benefits regarding increased speed of access to knowledge, 53 percent see reduced communication costs and 45 percent see increased satisfaction among their partners.

Despite that many companies are starting to benefit from Web 2.0, 79 percent of the respondents in the McKinsey study for 2010 still received fairly limited results. Of the remaining 21 percent Bughin & Chui (2010), distinguishes three groups especially benefitting from the use of web 2.0 within this McKinsey study. First, 13 percent of those companies using web 2.0 are denoted *internally networked companies* and they benefit from employees using the technologies in interaction with each other, that information is shared more readily and less hierarchically, that collaboration across organizational silos is more common as well as issues more often are tackled in a project based fashion. A key is that the tools are well

integrated in the workflow and that processes become significantly more flexible (Bughin & Chui 2010).

Another five percent of the companies using Web 2.0 are categorized as *externally networked organizations*, benefitting from interactions beyond company borders by using web 2.0 technologies to interact with customers and business partners. Finally another three percent of the companies using Web 2.0 are called *fully networked enterprises*, realizing a very high level of benefits. Within these organizations the use of Web 2.0 platforms is widespread involving employees and customers as well as business partners. Fundamental is that the technologies are promoting higher levels of collaboration by speeding up the breakdown of organizational barriers that hinder the information to flow effectively. (Bughin & Chui 2010)

The fundamental question of the results is if the reported benefits ultimately are seen in increased market shares and higher profit? According to Bughin & Chui (2010), correlations are seen where externally networked organizations are gaining market shares based on technology-enabled collaboration with external stakeholders. Internally networked enterprises, that collaborate across silos and share information widely, are also seeing improved market shares. Fully networked companies are more likely to be positioned as high performing companies, gaining high market shares, reaching higher profits and having faster growing earnings. Behind one sees more agile organizations that can take local decisions, are learning fast and can count on increasing network effects.

To summarize the work of Corso et al. (2008a) and the findings of McKinsey's study, the results are quite in line with each other. Most usage of Web 2.0 seems to be focused on new collaboration between organizational silos in a less hierarchical manner, sharing knowledge and building relationships and networks. In addition both Corso et al. (2008a) and Bughin & Chui (2010) localize a use of Web 2.0 to shape networks and enable activities beyond company borders. At the same time one shall not oversee that despite stories of success, the McKinsey study of 2010 revealed that still 79 percent of the respondents did not see more than limited results (Bughin & Chui 2010). In addition a corresponding McKinsey study from 2008 highlighted that many organizations not only had difficulties in finding a high overall satisfaction, but that also 22 percent of the respondents were clearly dissatisfied with the Web 2.0 attempts and some of these companies had stopped using the tools (Bughin et al. 2008). All in all previous research shows that many companies still are struggling with the adaptation of Enterprise 2.0 platforms but unquestionable benefits are shown from the ones that have succeeded.

3.2.2 Classifying Enterprise 2.0

The application of Web 2.0 technologies used within enterprises are evidently growing, influenced by social trends of global collaboration. But what is Enterprise 2.0 in detail, when going beyond the notations of being platforms enabling an increased collaboration? Different attempts to break down the Enterprise 2.0 concept have been made, where the classification models of SLATES and FLATTNESSES are the most well known (Cook 2008).

McAfee (2006) uses the acronym SLATES (Search, Links, Authoring, Tags, Extensions and Signals) as a classification model or framework for Enterprise 2.0.

- *Search*: Information has little value if it cannot be found. An effective platform must therefore be easy to search within, not the least by using keywords. As McAfee (2009) points out, internal intranets are usually much worse in this aspect than the internet.

- *Links*: The answer to the question of why the internet is so much easier to search on than the intranet is links. Why search technologies work so well on internet is due to the dense link structure. To increase the search ability on corporate intranet there is a need to expand the often limited group of people that make links. (McAfee 2009)

- *Authoring*: Via tools allowing people to contribute, the intranet platform shifts from being a creation of a few to a constantly updated interlinked creation of many people. Web 2.0 platforms help to capture the desire to contribute, which people through their use of blogs and Wikipedia have shown that they have. Thereby the company will gain shared knowledge, expertise and insights by letting the big masses contribute. (McAfee 2006)

- *Tags*: By using tags there is a possibility to move away from pre-categorization of content but instead let a collective categorization emerge over time, denoted folksonomy. McAfee (2009) refers to a survey by Forrester Research which points out that after a better search function within intranets, a better categorization is called for. Besides using tags for categorization, they provide a way to keep track of the platforms employees visit, making patterns more visible.

- *Extensions*: By combining computer technology with the use of tagging it is possible to give users the information such as, "If you liked that you may like this as well". An example of this is Amazon, providing additional suggestions to one's search. Extensions also encompass similar techniques as like and dislike applications. (McAfee 2009)

- *Signals*: In order not to get overwhelmed of an increasing stream of new info, there are possibilities to use signals in order to inform when new relevant content appears. This can be made by e-mails, but as inboxes already in many ways are overfilled technologies as RSS (really simple syndication) provide a better solution. By using RSS you do not have to search for updates but instead, using an aggregator, updates will emerge by short notices of headlines. (McAfee 2009)

Hinchcliffe (2007) has extended the SLATES concept by adding four new aspects of the Enterprise 2.0 resulting in the concept of FLATNESSES (Freeform, Links, Authorship, Tagging, Network-oriented, Extensions, Search, Social, Emergence and Signals). According to Hinchcliffe (2007), the SLATES acronym missed out the intended outcomes of Enterprise 2.0 by being strictly capability oriented. In the FLATNESSES concept this is addressed by adding the social, emergent and freeform aspects. In addition another capability aspect is added by calling the Enterprise 2.0 network-oriented; all in all shaping a concept that by its name reflects the enterprises' open and democratic character (Hinchcliffe 2007).

3.2.3 Different Collaborative Platforms

Certainly the Enterprise 2.0 responds to several needs, problems or opportunities as a concept in general. To understand how it works, one has to break down the concept into the different parts that build up the bigger picture though. Despite the denotation of Enterprise 2.0 being more than just platforms (Tredinnick 2006; Levy 2009), one cannot neglect the role they play as enablers. The Web 2.0 tools that build up the Enterprise 2.0 can exist as stand-alone platforms, as coexisting ones supporting each other or integrated in overlying intranets and portals. Web 2.0 applications can also be integrated in collaborative platforms like for

example Microsoft SharePoint or Lotus Connection, sometimes denoted as groupware. Within these platforms as well as outside, informal networks can be formed consisting of members sharing different common interests or being part of project teams. These informal networks, often referred to as communities of practice (Brown and Duguid 1998), can then set up their own array of relevant Web 2.0 tools.

Web 2.0 applications can also support or be part of idea management systems as touched upon in chapter 3.1.6. Tools like discussion forums can be used to discuss ideas aiming at improvements. Additionally there are simple tools as voting, rating, like or dislike applications that can support the collaboration within modern idea management systems. Web 2.0 platforms can also be used for virtual collaboration events as idea jams, which are huge online brainstorming sessions. An example is found from 2006 when IBM organized the InnovationJam event which involved 150000 people including employees, business partners and customers and ultimately resulted in participants posting over 46000 ideas (Dearstyne 2007).

There are different ways to group the Web 2.0 platforms. Soriano et al. (2007) groups the platform or tools used by an enterprise's virtual communities as social and linking tools (like tools for social networking, social bookmarking and social search), user-contributed content management platforms (like wikis, blogs and forums), tools for user opinions (like tools that support commenting and voting) and subscription based information distribution tools (like RSS-feeds). Another attempt to group or characterize is presented by Koch (2008) as shown in figure 3.

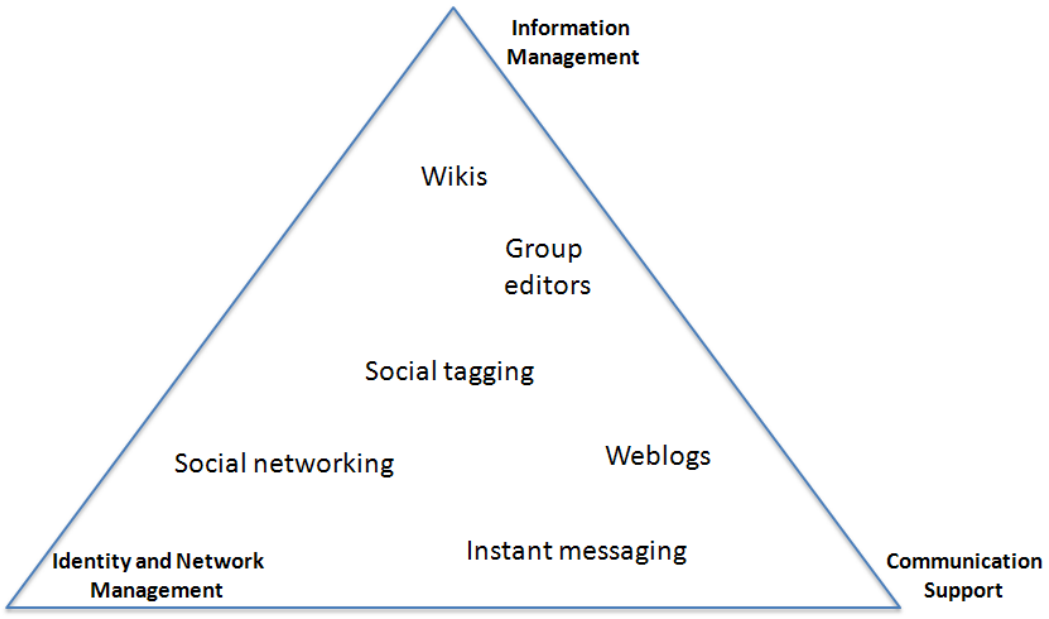


Figure 3: This triangle shows how different Web 2.0 platforms are positioned according to the fields of information management, identity and network management and communication support (Koch 2008).

For the presentation of each different platform or tool within this thesis, the 4Cs categorization developed by Cook (2008) will be used. Cook (2008) uses a four-category classification model, where focus is put on actions involved rather than the components or characteristics. This model includes the categories of communication, cooperation, collaboration and connection as shown in figure 4. As Cook (2008) states, there evidently is some overlap between the categories.

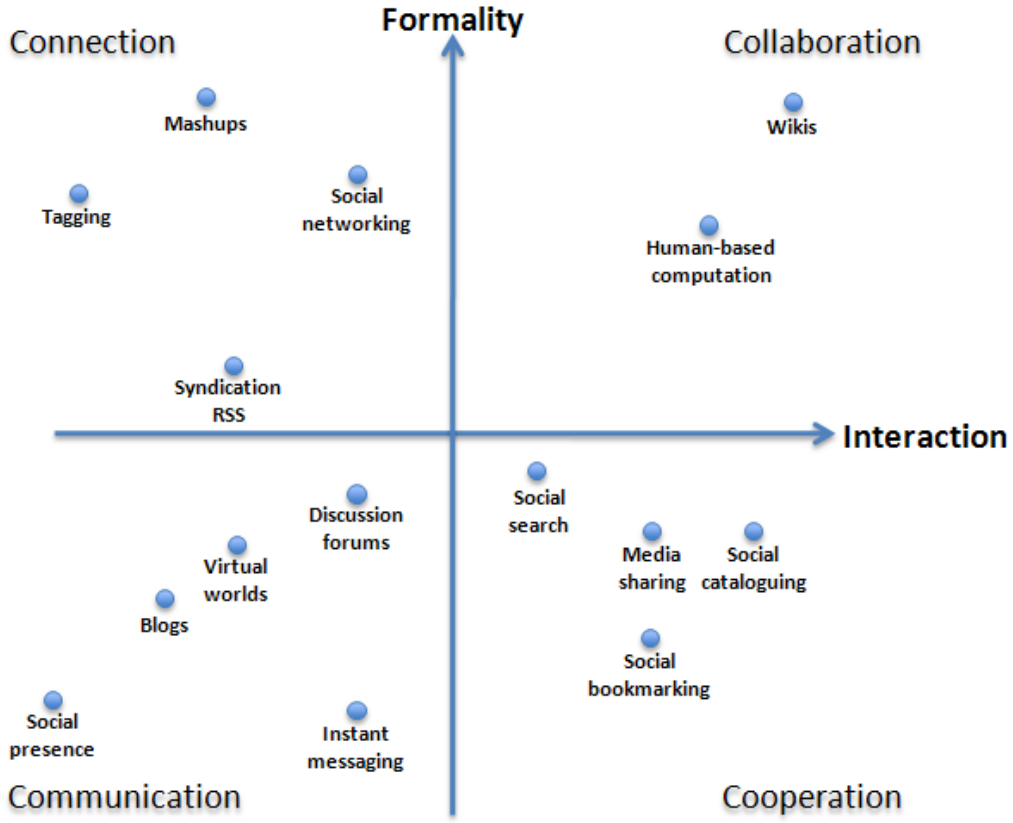


Figure 4: This graphical display shows how the different Web 2.0 platforms serve different aims. The axis of formality and interaction shape four quadrants, each one connected to one of the four C:s which are communication, cooperation, collaboration and connection (Cook 2008).

3.2.3.1 Communication

The new communication tools that exist can be characterized by enabling a more informal communication than the one taking place trough for example intranet and portals, which is heavily steered by guidelines. Thereby it is not said that the new type of communication will outmaneuver older ones. There are incentives for both types and simultaneously there are no barriers to let both types exist side by side. The new communication tools as blogs, discussion forums and social presence are the simplest and easiest of Web 2.0 platforms to experiment with. They work well in informal cultures but if group efforts are prioritized over single contributions the organization may gain even higher benefits looking into cooperation tools. (Cook 2008)

Discussion Forums

One of the earliest social software tools used by companies for knowledge creation and sharing is discussion forums (Wagner & Bolloju 2005; Cook 2008). Originally the exchange was possible with e-mail technology and a list of registered users. Then via the use of web-publication and message threading an independent record of content has emerged, moving the discussion forum from being a push into a pull technology (Wagner & Bolloju 2005). New features as filters, statistics and message approval ratings have also emerged. These forums, in business context for example in control of the IT-department, are often characterized by categories, rules and structure. This formality may have its motives but can also hinder discussions and creativity (Cook 2008).

Blogs

A blog, or web log as the name originates from, is a form of online journal or diary, hosted on websites (Bughin 2007). The blog platform, that first appeared in mid 1990's (Tredinnick 2006), is a powerful two way communication tool (Murugesan 2007). Within enterprises blogs are used by individuals to communicate information to the whole organization or within project teams where multiple authors (bloggers) can keep people up to date with the current progress by short updated entries (Cook 2008; Von Kortzfleisch et al. 2008). By using special blog software the blogs are particularly easy to maintain compared to regular websites (Von Kortzfleisch et al. 2008). Tredinnick (2006) highlights the fact that the ease of publishing content makes blog a democratic medium allowing almost anyone to participate.

According to Cook (2008) blogs are mainly supporting three areas where knowledge management is the first one, where blogs have the ability to record thoughts, ideas and opinions in a form that is open to its surrounding (Cook 2008). Blogs are an ideal medium for experts to broadcast their expertise to a large number of people (Wagner & Bolloju 2005). Secondly blogs can be of use within business intelligence, as competitors, products and related topics can get large coverage through authors and people commenting all together indicating an area of concern. Third, Cook (2008) points out the use within project management where blogs can be vital in capturing informal and unstructured information as well as blogs to some extent can make up for limited face-to-face contact.

By using syndication (see RSS as described further down in this chapter) it is possible to distribute blog posts in an efficient way and save time (Bughin 2007; Muregesan 2007). This technique enables that one automatically receive updates and new entries of blogs that one has chosen to follow. By linking blogs to each other it is also easy for small groups of bloggers to follow each other (Wagner & Bolloju 2005). Another aspect is that blogs are easy to find, where search functions can search for content as well as track interconnections between different blogs (Murugesan 2007).

A general idea is that the blog is intended to encourage the audience by enabling readers to comment, which results in a discussion (Cook 2008). Simultaneously one has to consider the aspects of trust and openness as authors and people commenting are usually identifiable as in contradiction to when posting something on an anonymous intranet page.

Instant Messaging

Online chatting or instant messaging has in the past mainly been used in the private life of people. As participant you receive text messages in real time in a push procedure that takes place over a network and enables the possibility of immediate answers (Von Kortzfleisch et al. 2008). Yet there is an increased trend in using instant messaging as a business tool. Instant messaging is normally text-based but audio and video capabilities are increasingly built in and originally text-based messaging tools now offer video and telephone conferences (Cook 2008; Von Kortzfleisch et al. 2008).

What distinguish instant messaging from e-mails is that it is more of a conversation than posting a letter (Cook 2008). A key feature of using instant messaging as a business communication tool is that geographically spread teams in separate time zones can communicate in real time compared to asynchronous e-mail applications. This is enabled by checking on-line status in contrast to what is possible regarding telephone and e-mail (Von Kortzfleisch et al. 2008). Besides you are able to have a number of ongoing conversations simultaneously, as opposed to for example a telephone call (Cook 2008). Still some fear or

critique is raised regarding the possibility of misuse and that instant messaging may be just another channel of distraction (Cook 2008).

Social Presence & Micro-blogging

According to Cook (2008), the use of social presence is a relatively new phenomenon, built on the concept of instant messaging where there is a need to see others' status updates. By using a social presence tool you can make updates about for example what you are doing and where you are, just as one is able to in for example Facebook. The use of a social presence function is within corporate environment promising as a micro-blogging (like Twitter) platform. Lindegaard (2010) means that even with a 140-character limit as in Twitter, people can learn more about each other. Ultimately both personal and professional information about each other leads to stronger ties and greater willingness to exchange information and collaborate (Lindegaard 2010). According to Cook (2008) social presence can be a powerful yet simple way to keep in touch with employees as well as used for knowledge management.

Virtual Worlds

By the use of virtual worlds one allows people to meet in a computer based environment trying to resemble the real world. Each person usually has a presentation of themselves. Virtual worlds have their roots in gaming and three dimensional social networks but can in a company context serve as an environment for meetings, training activities or simply as an arena for socializing. (Cook 2008)

3.2.3.2 Cooperation

Cooperation is supported by software that enables to share content with other employees in structured or unstructured ways. Examples of these tools are the ones for image and video sharing as well as social bookmarking and social cataloging. These tools support informal working and are good for enabling interactions in informal working conditions. The cooperation tools rely heavily on the network effect, that is, that value increases as more people use the tools. (Cook 2008)

Media Sharing

One of the most used social software applications when it comes to private use is media sharing with examples of photo sharing via flickr and video sharing within YouTube. The use within company context may be limited considering photo sharing, but regarding video sharing it is very suitable when it comes to virtual learning purpose (Cook 2008). Another type of media sharing is the use of podcasts, a concept based on receiving typically audio files (but also video) over internet via subscription of syndication feeds from chosen sources. According to Bughin (2007), podcasts are often distributed through an aggregator like iTunes.

What makes media sharing real powerful is when the media to share is embedded in other applications. This can be exemplified by images or videos embedded in blog posts and web pages which significantly increases the traffic, instead of waiting for people to view media at the original source. In addition one shall highlight the potential to extend the media sharing by possibilities to tag, rate and vote on material in purpose of identifying patterns, relations and groupings. This takes social media sharing beyond the publishing and downloading of documents, by which it is outdating current intranets in many aspects. (Cook 2008)

Social Bookmarking

The concept of social bookmarking enable people to post links to, or bookmark, interesting websites (Cook 2008), or intranet content (Cook 2008; Von Kortzfleisch et al. 2008). The bookmarks, which can be applied to both intranet information as well as external websites, can be used both for individual reference as well as shared with colleagues in the organization (Cook 2008; Von Kortzfleisch et al. 2008). Until now, social bookmarking is not that widespread within companies for knowledge management or corporate intelligence. Existing social bookmarking services are focused on individuals and not yet for whole organizations (Cook 2008). There is some use of individual public tools but these are not suitable as they are easy to track by others and are therefore a risk as sensitive information can leak out. An example of these bookmarking tools or services used in the private life of people is del.icio.us (Murugesan 2007; McAfee 2009).

The potential of social bookmarking lies in the ability to support employee contributed corporate intelligence by suggesting relevant information to others (Cook 2008). Benefits emerge also when public bookmark lists are combined with an applied search function (Von Kortzfleisch et al. 2008). Based on people starting to tag (see tagging below) bookmarks, it is possible to search for colleagues by their interests as well as the tags enable the locating of expertise within the company (Cook 2008; Von Kortzfleisch et al. 2008).

Social Cataloging

The use of social cataloging in a business context is to date not that easy to find, but the possibilities of using it is endless. Social cataloging are user built databases with information on specific topics as corporate data like contact info, supplier recommendation, competitor intelligence, etcetera. According to Cook (2008) social cataloging can be a way to collectively increase the quality as well as the quantity of content in systems like customer relationship management ones. (Cook 2008)

3.2.3.3 Collaboration

Collaborative social software is distinguished from cooperative social software by that they are supporting the engagement of employees involved in a coordinated effort to solve problems based on shared commitment and goals. These tools, like wikis, may be better suited in more formal cultures than cooperative tools that are very good for interaction in informal cultures. (Cook 2008)

Wikis

A Wiki is a website including pages that can be edited by persons with a required level of access (Cook 2008). Bughin (2007) describes a wiki as a system for collaborative publishing, where groups of people contribute to online documents or discussions. The core is within the collaborative authoring (Tredinnick 2006), which according to Levy (2009) makes the platform a democratic alternative. Levy (2009) also states that the wiki is known for its friendly user interface and is flexible both in content and structure. Some fear exists that the openness and collaborative authoring, by different opinions and the dependency of consensus, may lead to a disaster. Still, public wikis like Wikipedia have shown that the result can be both credible and stable (Tredinnick 2006). According to Cook (2008) examples are shown in organisations were e-mail traffic has dropped by three-quarters and meeting times have been cut in half due to the more effective collaboration enabled by wikis.

Wikis are mostly used and best suited for editing live information that is constantly changing, as for example collaborative document creating rather than publishing final version documents (Cook 2008). Despite this some organizations are starting to replace their intranet by wikis. According to Tredinnick (2006), wikis might be seen as an alternative for commercial content-management systems.

The wiki is supported by a database that keeps track of all changes made, resulting in that users can compare changes and go back to a previous version (Murugesan 2007; McAfee 2009). All contribution is stored permanently and is visible as well as reversible (McAfee 2009). By using a built-in search engine it is possible to search for information as well as topics (Murugesan 2007). Also, wiki engines enable easy creation of links between different pages which enlarges another dimension of knowledge sharing (Levy 2009).

Human-Based Computation

The area of human-based computation is quite complex but in its simplest form it can support the capture and ranking of individual contributions by wider groups of participants. The main idea is that the people opposite to the system or the computer can analyze and recommend something. In practice this can be seen in contributions as when editing wikis as well as virtual collaborative problem solving. The benefit lies in consensus and collective decision making, using a virtual arena where people can connect and collaborate. (Cook 2008)

3.2.3.4 Connection

Regarding connection, social networking platforms but also search techniques, tagging, syndication and mashups should be included. The aim of these tools is to connect people with each other as well as with content (Cook 2008). The tools are also dependent on each other as exemplified by how modern search functions' performance is improved by tagging as well as how content in mashups can be held updated by RSS feeds.

Social Networking

Within the Web 2.0 world social networking refers to the use of platforms enabling people to learn more about other's skills, talents, knowledge or preferences which in a company context help identifying experts (Bughin 2007). Lindegaard (2010) states that it never before has been easier to find people with the right knowledge thanks to social networking platforms, such as LinkedIn and Facebook, which has led to that companies increasingly have started to see professional value. In an enterprise context social networking can also be used to find new partners and customers as relationships over the web are fostered and maintained (Von Kortzfleisch et al. 2008). According to Cook (2008), social networking is especially useful when employees are individually rewarded but there is a need to encourage knowledge sharing and connections with others.

In a wider perspective Levy (2009) argues that all applications as blogs, wikis, RSS, tagging, etcetera, support the social networking. Regarding the specific platforms though, commercial examples are found in Myspace and Facebook as well as in Friendster and LinkedIn, which more heavily focus on networking for professional aims (Bughin 2007; Von Kortzfleisch et al. 2008). Different platforms work in a similar way, where an initial participant signs in and fills in a profile with relevant information and then invite others which makes the network grow (Von Kortzfleisch et al. 2008). Extensions to these networks are found in the possibility to track communication, as e-mails, between employees in order to rank the strength of different relationships (Cook 2008). Search functions then enable additional value in finding people to connect with (Von Kortzfleisch et al. 2008).

Tagging

Tags are keywords that can be added (by special tag tools) to content as documents, articles in blogs or web pages (Murugesan 2007). These keywords are a kind of metadata (data about data) that is critical in providing a context and thereby increases effectiveness in selecting data to read or analyze. The usage of tags is a base for new connections, links between various contents and the sharing of it (Levy 2009). Usually it is possible to see which persons have tagged what, which gives the possibility to see what kind of content a person is interested in (Cook 2008). Additionally tags are required in what earlier has been described as social bookmarking.

Furthermore tagging is a corner stone in user created taxonomies which usually are denoted folksonomies. Taxonomies refer to the science of classifying things hierarchically, whereas folksonomy is an alternative categorization system developed at a single point in time by collaborative authority (McAfee 2009). The tags can be freely chosen which builds up these non-hierarchical user generated categorized systems (Cook 2008). This results, according to Cook (2008), in a reinforced workplace democracy. In strive for best results Cook (2008) believes in a co-existence of taxonomies and folksonomies which is perfectly possible.

A possibility when using tags is to display so called tag clouds of the most popular tags (McAfee 2009). Generally tags, that are used more frequently, are displayed in larger font size as well as in alphabetical order (Murugesan 2007). When selecting a tag within the cloud it is possible to see associated items to the chosen tag.

Search & Social Search

According to Cook (2008), enterprise search engines do not meet employee requirements by either presenting search results being of no value or inundated hundreds of results prioritized by computer algorithms. By investigating meta data the algorithmic approach will rely heavily on the author of an item as well as popularity and relevance by using hyperlinks. This works well on internet where site owners spend time and money on influencing their search engine but less well regarding enterprise content. According to McAfee (2009), it is always easier to find information on the internet than on corporate intranets.

Social search works by using keywords as tags. This makes the result respond to a collective intelligence of large groups that have not only gone through selection but also been tagged with describing keywords. According to Cook (2008) enterprises benefit from the emerging social search functions, usually combined with existing traditional ones in order to harness the possibilities of both in a reach for superior results.

Syndication & Notification

By using RSS (Really Simple Syndication), which has come to be the dominantly syndication format, it is possible to filter an increasing amount of information (Cook 2008). This is done by syndicating web content by the use of content feeds (XML-marked files) (Tredinnick 2006). By using a RSS reader it is possible to aggregate content from diverse web sites into one user-space presented in a consistent format (Tredinnick 2006; Cook 2008). The use of RSS subscription to favorite or valuable web sites will also give automatic updates which is reducing the need for personal checking of various sites, ultimately resulting in time savings (Cook 2008). This is also true internally in organizations where search times can be reduced by automatically getting updates of meeting notes, internal blogs and notifications. Finally the

use of RSS will push information out into the company, but in a way that enables the respondent to choose what to receive (Cook 2008).

RSS is a vital part in fostering the collaboration need which social software responds to. According to Cook (2008), it is not only the contribution to wikis, blogs etcetera that is the main driver for collaboration but consumption of created material that drives employees to comment, change a wiki page, share knowledge or vote on ideas. The RSS will push the consumption in a way that contribution increases in a positive feed-back loop.

Mashups

A web mashup combine information and services from a number of different Web-based sources, both internal and external, into a dashboard-like view (Murugesan 2007). These mashups are created relatively quick and easy by application programming interfaces (APIs) (Cook 2008). The benefits of using mashups are not seen in the data provided as such but the mashup improves the user interface. It enables a better way to navigate through information and makes combined data more relevant (Murugesan 2007).

3.2.4 The Maturity of Virtual Collaborative Tools

A key question to answer is which of the different Web 2.0 tools and platforms to make use of and when. One way to facilitate the analysis is to make use of the Hype Cycle curve developed by the Gartner Group, shown in figure 5.

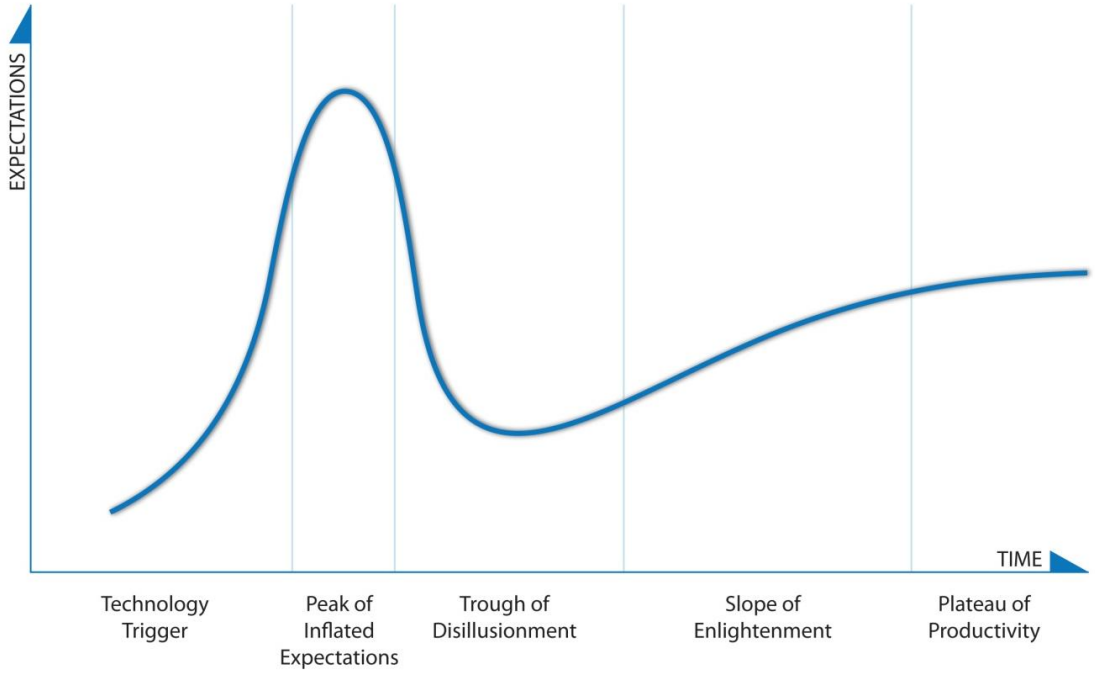


Figure 5: This figure shows the Gartner Hype Cycle with corresponding phases.

The Hype Cycle curve describes the phases a technology is likely to pass from being presented by its inventors or developers to reach a mainstream adoption, delivering value for its users (Fenn 2010). The five phases are the following.

- *Technology Trigger* – when a breakthrough is reported that initiates public interest and buzz.

- *Peak of Inflated Expectations* – where the technology is much talked about but not really put into productive use. Results at this stage are rare. In this phase it is common that one may be lured to invest too early in the new tools and technologies due to general excitement and fear of losing out on opportunities.

- *Trough of Disillusionment* – is the phase when disappointment for lack of results replaces the early excitement and less favorable stories are reported via media.

- *Slope of Enlightenment* – here some early adopters overcome hurdles and move forward exploiting the technology and put it to good use. Best practices are being developed, codified and socialized.

- *Plateau of Productivity* – in this final phase growing numbers of organizations will make use of the solutions at very low risk level, when usage is getting widespread at an accelerated pace.

There are two common risks in the selection of tools according to Fenn (2010). The first is to be too early selecting a technology or tool at the peak of inflated expectations. Here the risk is to be using technology that is hyped and not mature enough leading to that it may not survive in the marketplace. An investment like this is likely to become an expensive lesson. The second risk is to wait too long and not make use of the technology until it is in the plateau phase, leading to that the organization may miss important productivity gains. According to Fenn (2010) though, it is not until the end of the slope of enlightenment that methodologies and best practices are developed.

An analysis of Web 2.0 tools and social software, performed by Gartner, shows where the key Web 2.0 tools are positioned on the Hype Cycle curve as shown in figure 6 (Landry 2010).

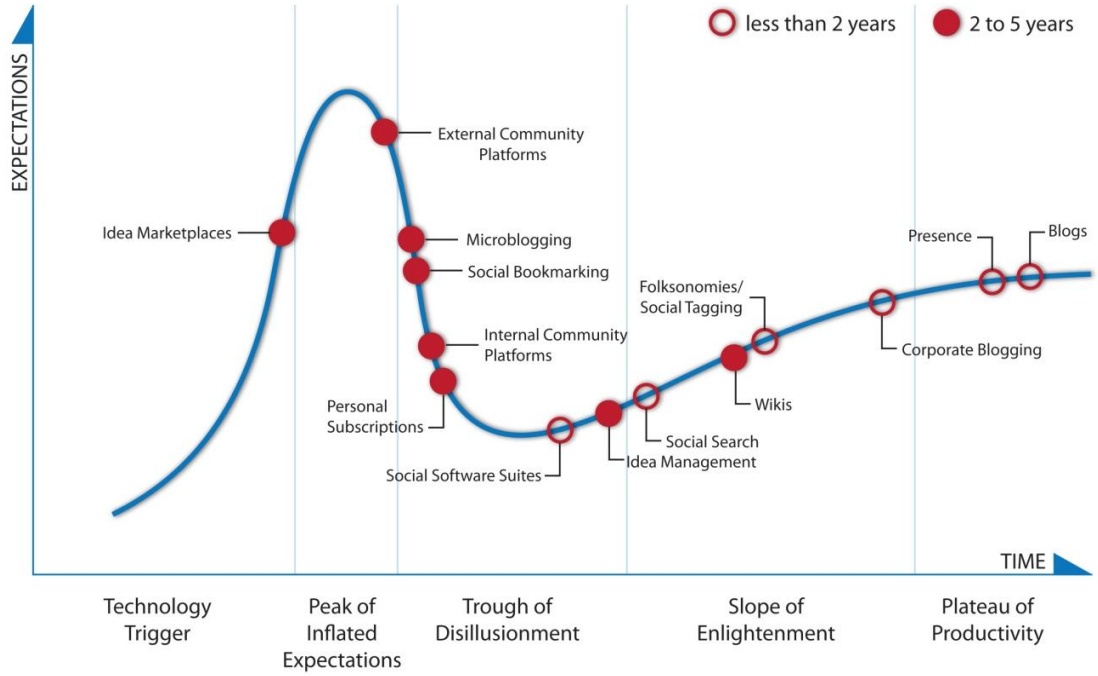


Figure 6: This figure shows the positioning at the Hype Cycle curve for a relevant selection of Web 2.0 tools based on Gartner Research (Landry 2010). The circles in the graph are representing years to mainstream adoption.

3.2.5 Barriers and Critical Success Factors for Implementation

To be able to implement and make use of the Enterprise 2.0 platforms in a successful manner, one has to be aware of the fact that companies proceed with different goals and intentions as well as organizations and businesses differ (McAfee 2009). Most likely to reach benefits of Web 2.0, according to a 2009 McKinsey study, are companies with revenues exceeding one billion dollar, and business-to-business organizations rather than smaller companies (Bughin et al. 2009). Especially beneficial results are seen within high-technology companies followed by organizations offering business, legal and professional services. Still though, the Web 2.0 platforms share some characteristics that, regardless of company, lead to that some general recommendations can be given. These shared characteristics, interesting for implementation and further operations, are that Web 2.0 platforms are inherently disruptive, often dependent on cultural aspects within the company but not being technically complex (Chui et al. 2009). Instead Web 2.0 platforms are rather lightweight and do not necessarily require technological complex integration. What they particularly need though is a high degree of participation to be effective (Chui et al. 2010).

A remaining key question one has to ask before implementing Web 2.0 tools is of course whether it is a welcomed leap for the organization to take or not. Despite the possibilities (as presented in the proceeding chapters), McAfee (2009) states that many leaders have a set of concerns including the lost control, misuse of possibilities, posting either inaccurate information or inappropriate content, leaks of secrets and employees spending their time on irrelevances. According to McAfee (2009) these concerns are not serious risks though, as individuals still not will be anonymous in enterprise systems, that people in general know how to behave appropriately, that people will react when members are misusing the trust and that leaders will not lose their ability to intervene. Still, many executives as well as legal and human resources are considering the risk regarding security and lack of control. Corso et al. (2008a) states for example that the question of openness towards external stakeholders without compromising security and intellectual property is crucial. According to McAfee (2009) the problem is that executives, legal and human resources are focusing on the possible issues but do not consider the opportunities.

As Hinchcliffe (2007) argues, Enterprise 2.0 is going to happen whether the organizations' leadership wants it or not. This is showed by numerous examples of grassroots adaptation where Web 2.0 applications have been made use of in quite informal ways. Grassroots attitude is also a significant catalyst of adoption and growth, according to the McKinsey global survey in 2007 (Bughin 2007). The key for organizations and the IT-departments is now rather to support the initiatives by providing key services as enterprise search and try to prevent development within silos leading to redundant work and unsynchronized data (Hinchcliffe 2007).

If the organization has come over the debate of security and control issues, the important work lies in how to increase usage (McAfee 2009). This has its roots in studies showing that the usage rate is being directly related to company satisfaction and experienced benefits (Bughin et al. 2008). Looking at the internet there are impressive numbers of people contributing, but the percentage compared to all users is still quite low (McAfee 2009). With the same portion of contributors to Web 2.0 technologies within companies the result would be a disaster (Tredinnick 2006). Levy (2009) takes a folksonomy as an example and points out that even if it works on the internet it may not work as well in a small organization and that not everyone can benefit from the long tail. Where the company is large enough to benefit, the increase of the percentage of intranet users who contribute within the platforms is

a key factor in speeding up a slow pace adoption of Enterprise 2.0 (McAfee 2009). Cook (2008) adds that when considering usage it is not only the persons contributing with content in the first place that are of great value, but also all those filtering information by editing, commenting and rating.

To increase usage there are several barriers or obstacles one need to overcome. Respondents, disappointed about the development (in the yearly studies performed by McKinsey in 2008-2010) highlighted inabilities for management to grasp the potential of financial results of web 2.0 and their lack of understanding for how value is created through the usage (Bughin et al. 2008; Chui et al. 2010). Furthermore, unresponsive corporate cultures and organizational structures in combination with inability of managers to understand the new levers of change were other obstacles mentioned. Leaders who do not know how to encourage the participation and un-excited, suspicious and uncomfortable ones that may call off the efforts, ultimately result in that organizations often fail to reach the level of usage needed to gain beneficial effects.

McAfee (2009) on the other hand refers to a panel of early adopters he moderated in an Enterprise 2.0 conference in 2008, where respondents did not see the management as a hindrance but rather the users as the reason for a quite slow growth regarding Web 2.0 usage. Entrenched practices and mind sets in combination with some degree of technophobia was mentioned as factors limiting the adoption pace. McAfee (2009) finds the explanation in that persons prefer keeping what they have even though superior alternatives are available. Usually new techniques or processes must be considerably better to have people change which, according to McAfee (2009), will lead to that the implementation of Enterprise 2.0 not happens overnight. As Hinchcliffe (2007) argues the benefits can be dramatic, but simultaneously they will only build steadily over time.

The McKinsey studies, as presented above, are covering a broad array of companies and elicit that management often has an impediment effect. McAfee (2009) refers to early adopters, in other words companies that have reached far, and highlights the users as the main question for implementation. In the latter case it may be that as early adopters, the management had a key impact but for these companies rather as an enabler. What is clear though is that barriers for implementation do not in the first place seem to be related to technical aspects. This is in line with Corso et al. (2008a) that state that the main difficulties in implementation are not on the technology side but rather on the cultural one.

According to Corso et al. (2008a) the Enterprise 2.0 concept is not well understood. Management has difficulties to identify and evaluate economic benefits and an organizational change is required. Today too many manage their implementation in a purely technical manner without considering the organizational or change management aspects. New possibilities are enabled by new technology but it is not a solution in itself but rather a part of it, if one manages the culture, behavior and people in an appropriate way (Corso et al 2008a). This is also supported by Levy (2009) stating that success will not be triggered by the adoption of tools but by a more complex adoption of principles, where the question is if knowledge management is ready for loosening the control. As Cook (2008) states, software is all about sharing and collaboration, and within business the required knowledge sharing within wikis and blogs is not intuitive as a result of work processes of the past. This highlights the cultural aspects of favoring open collaboration, communication and knowledge sharing at a level beyond the usage of the specific tools (Buginet al. 2009; Kirchner et al. 2009). The question if an organization will turn into an Enterprise 2.0 is ultimately dependent on the large

number of individual choices about which technologies to use for communication, collaboration and interaction which is based on personal biases and endowments (McAfee 2009).

Awareness of the challenges is what is needed to be able to form a strategy, separate for each company but with several important aspects affecting them all (McAfee 2009). An important starting point in this strategy is, according to McAfee (2009), to determine the desired results upon which one implements the suitable tools. McAfee (2009) argues that few implementations have been made based upon anything but ones needs and that one must be specific about these desires and the corresponding opportunities. Simultaneously McKinsey research, as presented below, indicates a crucial need for grassroots experimentation as support for selection before a full scale implementation can take place (Chui et al. 2009).

After the implementation the work of supporting adaptation follows, as already stated crucial in this chapter. As Cook (2008) argues there is little use of available software if no one uses them, regardless how successful the implementation may have been. To have adoption pick up in a successful manner requires communication to make people aware of the tools (Cook 2008). Additionally it is important to educate the workers through training of how the tools are working and how they are supposed to be used (Hinchcliffe 2007; Paroutis & Al Saleh 2009). As MacAfee (2009) states, many people of today do not know about authoring for a broader audience, tagging and linking content, etcetera. A related factor, not yet mentioned but highlighted by Kirchner et al. (2009), is that despite the presented statements of cultural and managerial aspects being more important than the tools themselves one cannot neglect that technological factors has a great impact. Aspects as ease of use and usability must be satisfying in order to have people motivated to contribute (Cook 2008; Kirchner et al. 2009).

According to Paroutis & Al Saleh (2009) another key is found in the promotion, where it is needed to communicate benefits to encourage adoption. Early adopters, usually found among younger employees as denoted the Generation Y, have a role to play as evangelists or champions that can influence others (McAfee 2009). Workers of this generation also expect Web 2.0 to be present in the organization and thereby they can be catalysts (Levy 2007). Simultaneously there are examples of where workers have left because the tools have not been available (McAfee 2009), a fact highlighting the need for attracting, retaining and engaging the employees of this generation (Tapscott 2006). A point made by Cook (2008) is that the individual value must be set over organizational goals in a way to reach the latter. Without focusing on the end user, adoption will not prosper in the needed way and the organizational value will stay low as a result.

Of additional importance, Chui et al. (2009) have identified six critical factors, based on their McKinsey studies, which will affect the result of the efforts to implement and increase adoption of Enterprise 2.0 technologies as presented below.

- *The transformation to a bottom up-culture needs help from the top*. Participatory technologies as Web 2.0 are clearly based on bottom-up involvement as a clear difference to other IT-systems of the past as CRM and ERP systems (Chui et al. 2009). As Cook (2008) argues though, one cannot just make social software available and then expect that user adoption and growth just will happen. Instead one must encourage early adopters and support those who follow by a proactive approach. A way to support the usage is by senior executives acting as role models by increasing

their own usage and thereby encouraging others (Bughin et al. 2009).

- *The best uses come from users - but they require help to scale*. Instead of predefining an intended usage for different technologies it is seen as important to increase awareness and allow experimentation before scaling up the usage (Chui et al. 2009). According to Cook (2008) one way may be to drive small pilot projects and collect feedback. An important aspect is transparency and letting mistakes happen. McKinsey research shows that the case is not usually that value occurs where you expect it (Chui et al. 2009). According to respondents, it is business units rather than IT departments that should select what Web 2.0 applications to use (Bughin et al. 2008). Dissatisfied respondents are stating that the opposite, where IT departments are delivering tools to business units, leads to that the tools not really fit their needs. This does not mean though that the company not has to help scaling up the use of the tools (Chui et al. 2009). According to Cook (2008) it is not likely, if you are not working in the perfect democratic organization, that a successful implementation just can be based on bottom up initiatives. A clear adaptation strategy is also needed where one must consider to either implement separate tools or else a more integrated system with an array of included applications. A common problem according to Cook (2008) is that organizations to often go for vendor-led choices based on what already is in use instead of focusing on user-led implementation based on present needs.

- *What´s in the workflow is what gets used*. Web 2.0 tools are not only quite novel, but also different to previous larger IT systems that clearly were introduced to replace something (Chui et al. 2009). The use of new platforms within Enterprise 2.0 is rather seen as separate from mainstream work and when the daily pile of work grows, less energy is left for working with these new tools. As Levy (2009) argues, the time is not just there to do just another thing. The key which will lead to benefits is therefore to implement the usage of Web 2.0 into the daily activities and workflow (Von Kortzfleisch et al. 2008; Bughin & Chui 2010). According to McAfee (2009) it may be needed to not allow e-mails within some projects or stating that all content shall be updated on a wiki for example.

- *Appeal to the participants' egos and needs - not just their wallets*. The new platforms are different which also leads to that traditional incentives, as financial or motivational ones, do not always help to increase participation (Chui et al. 2009; Bughin et al 2009; Paroutis & Al Saleh 2009). Fundamental regarding Web 2.0 is recognition and reputation as keys to participation and engagement (Paroutis & Al Saleh 2009). Examples of encouraging factors are found in rating by peers and online recognition status (Bughin et al. 2009). Also to get credit for shared ideas, one´s contributions recognized and to feel credibility as being an expert is crucial (Paroutis & Al Saleh 2009). The role of management being active in these aspects cannot be enough highlighted as their rewards or encouragement can be a main driver for Enterprise 2.0 adaptation (McAfee 2009). Just having executives and leaders being active by commenting, asking authors questions and bringing up Web 2.0 generated content on meetings can give great results.

- *The right solution comes from the right participants*. An important aspect is to find the right users that can create a critical mass as well as add value. With participatory technologies it is hard to know in advance who are or will be the best participants, but it is important to find the right base if one shall reach results (Chui et al. 2009).

Besides being aware of and locate the right people it is as crucial for management to be good at channel the energies associated with all spontaneous contributions (Corso et al 2008a).

- *Balance the top-down and self-management of risk*. A limiting factor for Web 2.0 growth is that participators feel discomfort or even fear using the tools (Chui et al. 2009). Paroutis & Al Saleh (2009) and Von Kortzfleisch et al. (2008) states the importance of feeling trust. This regards both trust in quality and reliability of content as well as trust regarding misuse, that others take credit for one´s work or that people not will reciprocate their efforts. Simultaneously many executives state, according to Chui et al. (2009), that participatory initiatives have been hindered by legal and human resources concerns. An issue is that many companies find it hard to balance control and freedom. The legal department and human resources shall establish reasonable policies like prohibiting anonymous posting etcetera but fears are as stated by McAfee (2009) often overblown. A fact is that social norms enforced by users within communities can be successful in self policing and thereby different risks are minimized (Chui et al. 2009).

Finally McAfee (2009) argues for not measuring the benefits of the implementation of Web 2.0 technology by return of investment figures. The complexity of those figures, based on too many cause-and-effect relationships makes accurate estimations unlikely. McAfee (2009) suggests organizations to instead evaluate their progress in terms of participation, number of blog posts and comments, edits on wikis or new pages, number of forum members, daily updates and general employee interest.

4. Empirical Findings

Within this chapter facts and elicit thoughts of the interviewees will be presented, based upon the schematic company and role description in chapter two. The findings are divided context wise within three main subchapters and are intended to represent an objective view of the respondents' answers. An important notation though is that only relevant parts for this thesis and its main objectives are presented. In addition, findings are grouped in a way that is intended to be accurate and clear but in some ways they may not give the whole picture if seen from the perspective of someone else.

4.1 Platforms, Methods and Reasons behind Usage

Regarding what virtual collaboration tools that are in use, quite a diverse picture emerges. While some companies have come real far, others are still at a stage of experimentation and evaluation. Many interviewees also describe a situation in between where tools are recently or just about to be implemented with intentions of full scale use. Not surprisingly the different tools have been implemented in response to specific strategic intents as well as being used differently with somewhat differing aims at different companies.

4.1.1 Web 2.0 Platforms in Use

While some companies have separate platforms or tools in use the research shows that it is more common to use these tools as an integrated part in a larger ECM or groupware platform like SharePoint, Lotus Notes or Lotus Connections. Whether integrated as an application in a larger system or serving as separate tools the following text will show what platforms or tools that are in use and their function. In addition an observation is that in many cases different communities or so called communities of practice have emerged or been created. These communities consist of a group of employees benefiting from having interaction between each other to share knowledge and ideas. In the larger systems as SharePoint or Lotus systems these communities usually have their own workspace created, including an eligible array of tools.

While having the empirical statements divided under different tool specific headings it is important to mention that the tools in some cases depend upon each other which leads to some overlapping descriptions. In other words some tools will to a limited extent show up under more than one heading, as the aims and use of the tools otherwise not easily will be understood.

Discussion Forums

A tool of widespread use within the studied companies is discussion forums. The intentions behind the usage and the way in which these forums are used varies quite heavily though. Within Company K these forums, that have been around for 15 years and now are having almost 40000 users, are set up to serve different forms of expertise, as global online communities of practice. The discussion forums are characterized by being formal and organized in quite a structured way. By this they respond to the need of having a robust system for long lived discussions concerning in-depth topics as explained by the Knowledge Management Manager at company K. Discussion forums within communities of practice are used in other companies as well, like Company C and as a key tool within the different communities in Company M. As described by the Innovation Director at Company M, the discussion going on is mostly handled by threaded discussion forums but also forums with commenting functions are in place, often linked to different knowledge objects as different kinds of files and media.

Another usage for discussion forums is as an add-on function within idea management systems where they support the possibility to discuss different submitted ideas. This way of using discussion forums are exploited in different but similar ways by for example companies as A, C, E, M and N where tools have been in use for some years, up to being just implemented. Additionally other companies are on their way of evaluating or just about to implement idea management system with included discussion forums as company F and J. In order to strengthen a company's ideation process, discussion forums can be used to enable idea jam events. These events are used within companies as D, K and N and the method is further presented in chapter 4.1.2.

An additional way of using this type of platform is by having online forums open for customers and suppliers. Company K is experimenting with this based on their online discussion forums and have opened up a few of them to external suppliers. In further upgrades they intend to increase these capabilities as this type of openness is getting more critical as well as accepted according to the Knowledge Management Manager at Company K. Company I on its hand have different local forums addressed towards customer connections in order to get feedback and insights either from consumer panels, niche consumers with special needs or from the public in general who gets the possibility to post questions that are responded to. Key learnings from the forum discussions are then compiled and sent out to affected people on a weekly basis according to the Innovation Director at Company I.

At Company I an internal web-based innovation forum is in use since less than a year ago, where all employees can register. Currently there are a couple of thousand users that through the forum can post challenges within projects or business situations that not necessarily have to regard product development. Simultaneously to this activity other registered users can answer with solutions. According to the Innovation Director at Company I, the main objective for this forum is to strengthen the innovation culture and simultaneously it is the closest to an idea management system they have.

Further use of discussion spaces are found connected to intranets. For example the Senior Business Strategy Manager at Company E mentions how published items as articles etcetera sometimes get commented and discussed by the employees.

Blogs

Another of the most widespread tools in use is blogs, used to some extent by all companies with some lone exceptions. Looking at company G, K, M and N, great use is seen for senior management or leaders to reach out with their communication to the organization. At Company G the different heads of the divisions use it as a well received one-way communication tool. Within Company K blogging has taken place for four years now with a similar function for leaders to communicate with their particular communities. In addition scientists have used blogs to post their notebooks which people can have a look at as well as comment on. Despite the possibility to comment, blogs within Company K shall according to the Knowledge Management Manager be seen as a one-to-many communication tool where it is communicated within the company that other tools like discussion forums are better suited for discussions than blogs are. At Company M the CEO uses a blog which has become a great success, but also there is a possibility to use blogs within different communities as well as there are blogs used for elicit feedback for the larger SharePoint-based platform which includes all different kinds of tools. The Innovation Director points out that other tools than blogs are probably used more within the communities though.

Within Company N, several executives are using blogs in their communication as well. Originally, some years back in time visionary leaders started to argue for using social tools in order to become more effective and within this drive, blogs were one of the first tools in use. Regarding these efforts blogs were intended to become well used internally as well as externally. The value sought for in the first place was to limit the current mail storms within the company as e-mail according to the Chief Technologist at Company N is seen as a bad tool in respect of information spread. By instead communicating or discussing in an open way and then linking to these posts (previous mails), one encourages a discussion around what is written in a blog, in a connected forum or in a commenting area. Additional value when using blogs is that the blogs are exposed to the search engine and while individuals are blogging they leave traces that over time build up a kind of curriculum vitae of what expertise an individual as a blogger possesses. By not only blogging internally but also externally, the company's expertise gets exposure for outside stakeholders, as the company's customers, which have a great value according to the Chief Technologist at Company N.

Other companies highlight the use of blogs to communicate different messages to customers. Company F is one example that besides the main intent of spreading messages and inspiring others, mentions the possibility to elicit thoughts and feedback through a corresponding moderated commenting field. This company is also blogging about what innovation means for the company and what ideas that have become products, with the underlying intention to make people aware of that the company is open for external ideas. The CEO of Company F is also one of the ones blogging towards customers. At Company I a blog is used in relation to a forum used for customer interaction. As a response to the question if the use of blogs will become more widespread or used within their organization though, the Innovation Director highlights that with all these blogs out there people cannot read more than they already do. At Company O blogs are used in some countries for communication towards retailer customers rather than innovation. Additional examples of usage are found in a recent pilot where one tests the blog within a project including several companies where the tools' purpose is to be a space for inspiration, good thoughts and ideas.

Of the remaining companies blogs are used in a more limited way. Many of these are still learning and experimenting. At Company J, blogs are used within some larger projects. Within Company D blogs have been used since half a year ago, to spread articles and interesting references. Furthermore blogs have been used to inspire people to take part in events like idea jams, but with a further strategic intent to respond to the knowledge sharing challenge. The Innovation Project Portfolio Manager at Company D simultaneously highlights a difficulty to hold the blogs alive over time, partly due to poor software. A similar picture is given by the Senior Business Strategy Manager at Company E, stating that there have been a lot of initiatives of internal blogs but that very few have reached the critical mass of readers that are commenting which have resulted in that many blogs have died. Simultaneously there are examples of ones that are working, usually quite area specific with an example of a blog with focus on consumer insights, giving reflections and sharing reports and results of interesting studies.

Instant Messaging

Instant messaging or chat tools is something that has been in use for a long time at Company N and is one of what the Chief Technologist denotes as the productivity increasing tools that simultaneously leads to a reduction of e-mails. In other companies, like Company G, chat tools are available through their larger Lotus Notes platform but according to the interviewed Director at the company, it is used to a limited extent.

Social Presence & Micro-blogging

Within Company N and as a part of their bigger Lotus Connection system there is a social presence function in use. The Collaboration & Innovation SME at Company N highlights how one within ones networks can make benefit of others social presence or micro-blog updates and get new ideas as well as take part of interesting information. At Company K there is a pilot project running for the micro-blogging tool known as Yammer. According to the Knowledge Management Manager, the company is piloting this tool as they see a need for something that can complement their more formal and very structured discussion forums. In some cases there is a need for a more lightweight approach and a more ad hoc type of discussion and mechanism to stay connected. At Company E the use of a micro-blog has the role of enhancing fast response on technical development issues and as a platform for sharing tips. Within this limited field where people have similar tasks, this tool is actively used. The Senior Business Strategy Manager tells that the micro-blog started as an underground activity, self built on free software, that has grown.

According to the Researcher, at University P, the use of Yammer has become extremely popular and the use is growing exponentially. This applies not only to Yammer but other micro-blogging platforms as well, like the ones being self built within companies. A main advantage with the micro-blog is the ease of use and that there are hardly any entry barriers. Additionally the micro-blog has an important function to fill when to find experts or persons with some specific knowledge which is sought for. As the Researcher explains, documents and other information usually are put in databases or closed project spaces that only are shared among the directly involved. The thing is that it can be of great value for so many more people. By using for example Yammer there is an opportunity based on posts and related threaded discussions to find the persons that seem to have the knowledge needed. When following others that are using micro-blogs one can also get many good ideas and tips based on for example links and updates.

Media Sharing

Media sharing in form of videos are used within Company K which has a YouTube like application. According to the Knowledge Management Manager they also find it useful to embed videos in their wiki to get a context around it. The company is also webcasting informal events in order to allow people who cannot attend these sessions to get access to recorded material at a later occasion. Additionally Company K is using short video clips for learning purposes, for example regarding the pilot project in Yammer that they are undertaking. According to the Knowledge Management Manager this is an increasingly used simple and lightweight approach that has been very well received. Another interviewee that explicitly has mentioned media sharing in form of videos is the Product Development Director at Company F, stating an aim for learning but with an external focus.

Social Bookmarking

One company that works with social bookmarking is Company N. The value of only having access to your own bookmarks is quite limited, as explained by the Chief Technologist. Information that you usually use is easy to find and the information you seldom use is something you can search for again. When instead having access to each other's bookmarks you are given a map of interesting sites, and accordingly these places that are interesting are usually simultaneously tagged up with comments. The use seems to be limited among companies in general but some are looking at social bookmarks for future implementation, like company B.

Wikis

One tool that is used by many is the wiki. Company K started with wikis back in 2006 and has now around 80000 users which must be considered a great success. At the moment there are now 8000-10000 active users or editors that are contributing with content, a number that company K would like to increase further. Company K uses the wiki as an encyclopedia, encouraging everyone to put any content that could be useful outside the specific team or department on the wiki. It is also possible to post links to material in other databases within the company or to external content within the wiki. The tool does benefit from having a robust search engine and you can also add your profile to what contributions you as a user submit which is encouraged by the company. The use started out with the need of a more blended learning approach and a more self directed type of learning. According to the Knowledge Management Manager one started to discuss how you could get content out of the masses and found that wiki could be a good approach.

While Company K uses the wiki as a standalone tool, additional ways of making use of wikis is to have it as one of many applications within a community workplace existing in larger IT platforms, based on SharePoint or Lotus Connections. This is since a couple of years utilized by company M and N, even though the Chief Technologist at Company N points out that wikis also are used outside these communities, available for broader audiences. Regarding the ones really contributing with content it is estimated to be around ten percent while everyone can benefit from it, figures in line with those in Company K. Another company using wikis in communities is found in Company C where content is submitted for discussions.

More recent implementations are found for example in Company A, where the use is based on a standard SharePoint application wiki since half a year back in time. The use of the wiki function is to date only utilized within the research and development department and at a stage of experimentation where one submits for example interesting links. According to the Research and Development Manager at Company A, the aim over time is to create a knowledge bank that will replace or complement the current formal report documentation. The wiki can also be used more operatively as explained by the Researcher connected to University P, who highlights how they in some cases have used wikis as a meeting point in projects. Thereby hundreds of protocols and other project documentation can be replaced by a jointly updated work space.

At Company E there is a lot of variation between departments and different functions but there are places where one uses wikis quite actively. Another company looking into wikis, but with so far limited use, is Company D which sees it as a part of the strategy for better knowledge sharing. Company B on its hand has tried to share knowledge within wikis but according to the Sales and Marketing Business Partner, it is not likely that this is helping them to develop the sought expertise.

Social Networking

When considering social networking different purposes are elicited. Some companies, for example Company O uses Facebook to some extent in some countries to reach out to customers and Company F has started up a group at LinkedIn with the purpose of recruiting people. Others are using platforms for internal and to some extent external social networking, as Company N, where their use of Lotus Connection includes profiles of all employees and consultants. Here you can shape your own networks, as stated by the Collaboration and

Innovation SME, which then can be used to exchange ideas, tips and knowledge by using the workspace including different applications.

Platforms enabling social networking by including lists of competence and experience are present or being implemented by several companies. The social networking is enhanced as people can search for competencies instead of documents which not always exist and also to form expertise groups. The communities and different forums that are in use within many companies are examples of these social networking formations. Communities are for example found in company C, M and N. At company M though, one is according to the Innovation Director aiming to increase the possibilities around profiles which is limited in SharePoint. The Innovation Director states that it would be favorable to be able to see who you are interacting with in a better way. The profile should for example include facts regarding number of posted items, how long one has been a member of a community and current knowledge ranking based on different criteria. All this to build up a better social networking arena where one, when searching for people, also could get connected info about surrounding employees with certain expertise close to what one is searching for. For example the search result could include links to other employees and their profiles. These kinds of things are looked upon in a system separate from the company's main collaborative SharePoint-based arena, but with the intention that these systems will support each other over time.

Tagging

Looking at Company M, they are tagging different knowledge objects (files like video, power points, word documents and instructions that have a value of being shared). According to the Innovation Director it is then possible to classify these objects as well as add a best before date, which together makes the objects much easier to search for. Tagging can be made based on different characteristics as what kind of item it is, which process it relates to or what geographical area it belongs to. All in all this is done in order to distinguish it from everything else. The Innovation Director makes a distinction between structured and unstructured data. Where structured data is searchable in alphabetic order, the unstructured data on the other hand is the one you do not know exists. Within for example communities you are able to get hints via shared material by someone who works with something interesting. When classifying this data it makes it much easier to find the information you do not know exists. Besides the possibility to tag items, a well used function within Company M is to rate things. To rate intranet content, as published articles is also mentioned to be done at Company E.

At company N tags are used which, according to the Chief Technologist, improves the search speed as discussed below. Tags can be put on to things like social bookmarks but can also be used in the internal telephone catalogue which includes pictures and a presentation of what you are doing. The Chief Technologist highlights that you within this catalogue can tag yourself or others with info of what competence you possess or what people you have worked with before. This leads ultimately to that not only items but persons as well are easier to find.

Search & Social Search

To have a well functioning search function is by many denoted as a very important part of handling and sharing knowledge. At Company K, the Knowledge Management Manager mentions the search for their wiki tools to be real robust and giving a great overview into things with links to other either external sources as well as to other internal databases within the company. The search is one key to why the wiki reached the great success, but as the Knowledge Management Manager explains other tools have their search functions and it is also possible to search at an overall level within the company. Search functions are always an

issue where you either have difficulty to find facts or otherwise find too much. Simultaneously the Knowledge Management Manager mentions that they are looking into new search technology with their upcoming implementation of SharePoint 2010.

Another company implementing the SharePoint 2010 platform is Company B, where the Sales and Marketing Business Partner sees a great improvement potential in the search function. A highlighted key is to not only find documents but improve the capability to find people as everything is not being documented and stored. An additional company that is implementing a SharePoint-based intranet is Company F, where the Product Development Director mentions the search function to be one of the cornerstones together with the register of employees. To have some kind of register of what skills people have and what they are good at, which also will be updated and filled in over time, is mentioned to be crucial by the interviewee.

At Company C the use of communities of practice has lead to that you are listed based upon your competence and then are searchable based upon these facts. As explained by the Principle Scientist, there are 13-14 core members and then some other hundred associated members that are listed. Looking at Company H, the Consultant states that they are using a search function that besides searching for documents also enables the search for experts within different areas. Different criteria are possible where you can search for people that have worked with projects for special companies or within different businesses. Additionally everyone has a profile where one registers all projects one is part of and also updating what skills and previous experiences one has. This builds up over time and then by searching on different topics it is possible to find other persons, according to the Consultant.

Looking at Company N, different databases and intranet components as well as a Lotus Connection system are in place. Based on overlying connections between these parts, the search engine has the possibility to search within all these components. An additional functionality is, according to the Chief Technologist, present in the form that if you are searching for something that someone else has looked into before you also will get a proposal of other contents that these persons have looked into. This gives you an array of related content that could be of potential value. The Chief Technologist states that the info that already have been processed by people and have appeared in the social tools via an added social bookmark, a link, a blog post or some tag, helps people to find what they are looking for. Accordingly the information that already is processed by someone else is the information one shall first look at, as it in 50 percent of the cases is what you are searching for. The result is less attempts to review other data which speeds up the search enormously according to the Chief Technologist.

Other search improvements worth mentioning are found at Company D where they have loosened a little on some security classes and unlocked some additional data for the search engine with an aim to show the crowds that things are happening. What shall be mentioned here is also that the company, according to the Innovation Project Portfolio Manager, has a search function that is giving proposals based on what initial characters you enter.

Syndication & Notification

Regarding syndication and RSS it does not seem to be on top of the agenda by the interviewees, instead related ideas mostly focused on updates or notification seem to be in use. For example RSS is used to some extent within company M, but according to the Innovation Director it is better to subscribe for alerts which are integrated in the company's configured SharePoint system and thereby fit better than RSS. Here it is possible to chose

whatever you would like to follow, like for example if it is what people write, if someone has found a thread, if something is changed or if someone has answered a question. An additional choice highlighted by the Innovation Director is that you can decide yourself how often to receive updates which are connected to the mail, like once a day or once a week. Accordingly the alerts are very useful when one is following sources that are seldom updated as one instead of always spending time by checking gets notified when something really happens.

The Senior Business Strategy Manager at Company E states that while integrated notification possibilities within SharePoint is a very good way to keep oneself updated it is used by very few. It is used by the Senior Business Strategy Manager though, to get updates regarding the idea management system.

E-mail notification as the way of updating people will be used by Company C as support for their upgraded idea management system in order to have interested parties updated. This function will be automated to reduce the workload for the administrators. At Company K e-mail notifications are used for the highly used discussion forums in the communities. According to the Knowledge Management Manager at Company K these communities require these notifications to keep people engaged. Simultaneously newer technology is looked into, according to the Knowledge Management Manager, and when now moving to a new version of SharePoint it is possible to use RSS feeds from the communities to be displayed in ones My Site pages.

Mashups

A widespread use of mashups can be directly linked to the great number of overlying enterprise content management systems or groupware like SharePoint, Lotus Notes or Lotus Connection as well as all these intranets and portals that are in use. Depending on what these larger platforms are aiming at, different mashup structures emerge. Looking at Company M for example they have a SharePoint-based but heavily self-configured platform with its own mashup display, different from others using un-configured standard solutions.

4.1.2 Larger Systems, Methods and Web 2.0 as Applications

The several platforms presented both theoretically in chapter 3.2.3 and empirically in chapter 4.1.1 are, as already described, in most cases parts of a bigger system. These systems can be either a collaborative platform in terms of an enterprise content management system or a groupware depending on what denotation to use, but can also be an idea management system.

Overlying Collaborative Platforms (ECM, Groupware)

What has been elicited is that in many cases SharePoint of different generations are used or about to be implemented as the overlying platform with examples in companies as A, B, D, E F, J, K and M. Accordingly Lotus Connection is found in company N, being widespread and intensively used and Lotus Notes is used as a more strictly knowledge management tool within for example Company G including limited Web 2.0 applications though. A factor highlighted by the Innovation Director at Company M regarding what platform to use, SharePoint was selected based upon its ease of integration with Microsoft Outlook and on its fast development.

In most cases the different Web 2.0 platforms serve as applications in these overlying platforms as SharePoint or Lotus Connections. An exception is found in Company K where heavily used discussion forums and the wiki platform are in place as standalone tools. Simultaneously, the Knowledge Management Manager at Company K highlights that they in

the future, when SharePoint 2010 will be in use, are looking for integration. Examples are found in the micro-blogging through Yammer which feed one can direct to My Site in SharePoint via an add-on and also that the discussion forums serving the communities can be migrated. To summarize the way the Web 2.0 platforms are used it seems like they are or will be part of bigger systems.

The overlying software systems can then be used in their standard form or as the base and starting point for company specific customization in order to shape a better intranet, portal, idea management system or whatever is sought for. While the elicit situation gives a clear view of an integrated use of the Web 2.0 platforms in larger systems, the refinement and development of these systems differ quite widely though. Some companies, as for example Company A, are using a standard version of SharePoint with restrictions from the IT-department for self programming. Others, like for example Company M utilizes SharePoint as a base for a heavily customized collaborative platform including all different kinds of functionality with integration of their idea management system as well.

Regardless of customization, these larger overlying systems enable to shape communities, as already been touched upon in previous chapters. While these group formations of expertise or shared interest do not require virtual support, the collaborative platforms certainly enable new possibilities of interaction regardless time and location. The possibility of putting up these communities as sub dividers within the larger platform is for example harnessed by company C, M, and N. As stated by the Chief Technologist of Company M as well as the Innovation Director of Company N, there is a possibility to make use of an array of Web 2.0 tools within these communities but at the same time you are free to choose what suits the particular community best and put together a suitable mashup.

Finally these overlying platforms, regardless what Web 2.0 applications they include, enable efficient file sharing as core functionality. An example of this is the knowledge objects that are shared via the platform at Company M. According to the Chief Technologist at Company N file sharing is a great way to reduce the mail traffic. Additional gains are found in that one can reduce the number of copies and enable that one always get hand of the latest version as all interested parties are having easy access and can work on the shared files. In addition these overlying platforms enable collaborative action through other functions, as within Company N where one has functionality within their Lotus Connections called activity. This functionality enables collaborative planning for meetings and events where you can divide work and discuss what to do etcetera.

Idea Management Systems (Corresponding Methods) and Idea Jams

A substantial number of companies have made use of different idea management systems, including different Web 2.0 applications aiming at collaborative feedback, discussion and improvements of submitted ideas. The early adopters of these systems and the promotion by different software providers have then together inspired other companies. This leads to that companies like for example J and O that do not have any well developed systems in use yet, are testing and evaluating what can be implemented in the future. Several other companies with systems in place or these who are about to implement have also been inspired by others, in combination of course with the aim of responding to internal needs.

In most cases these systems have been or will be globally implemented as for companies like A, C, E, F, M and I (a company which usage is described further down in this chapter). Still though, companies as A, B and E are facing challenges to have the usage of these systems to

take off, reach intended discussions and the number and quality of submitted ideas that is sought for. Simultaneously there are examples of companies that have succeeded as Company M, where the Innovation Director describes a system with large number of ideas and comments, as well as ideas that have been realized and reached implementation. Still, there are many employees that still see this system as a black box where ideas just disappear. While these systems currently seem to have high openness within the companies, they are not open towards external parties. Simultaneously the Innovation Director at Company M and the Product Development Director at Company F have intentions and are sharing thoughts of opening up these systems towards other stakeholders in order to strengthen their open innovation capabilities. Steps towards open innovation are taken by Company E where an online external portal directed towards other companies interested to share ideas or work with them is in use. Over time this portal, which is a channel into internal idea management systems, shall have discussion possibilities according to the Senior Business Strategy Manager. Another statement is that the need for opening up the company's efforts beyond internal innovation is seen by people all the way up at top management level.

Intentions behind these systems are found in the need to capture the creativity of people and to harness the collaborative possibilities by enabling discussions. More specifically the Product Development Director at Company F explains that it is important to be able to submit ideas between other ideation events such as innovation days or campaigns. If not, you otherwise have to remember what to share next time which is blocking your creativity as explained by the interviewee. With an idea management system in place, the Product Development Director means that you can submit ideas and then instead start from scratch with an open mind at the next upcoming event. According to the Innovation Director at Company M, they have previously seen that people just were sitting on their ideas which did not develop them much. With a new system including Web 2.0 functionality one gets rid of the same ideas being posted over and over again. Instead people can work together on development and refinement according to the Innovation Director.

The Principle Scientist at Company C explains their upgrade including discussion possibilities with that the committee at present becomes a bottleneck, but by opening up their system an increased amount of feedback will reach the idea submitter. The transparency will also give stimulation as it will make people more visible in the organization and show who is active and creative. An additional aim is seen in the new possibilities to form cross functional connections between different employees not yet possible. Further the Principle Scientist highlights the fact that the company will be able to handle more ideas as the work of feedback will be done collectively over a larger base of people. This is accordingly supported by the Innovation Director at Company M stating that the limited amount of people involved in the administration of the system within the company, cannot themselves give feedback to everyone which is considered to be a top priority. Increased possibilities for feedback are also a main driver for Company J, when they are planning for a future idea management system. The Concept Manager at the company also states the visibility as crucial, and that more people can take part in the evaluation. According to the Concept Manager there is a need for both having inputs from the crowds as well as being able to reach and get feedback from specific experts.

Looking at the functionality of these systems in use in different companies, it does not seem to differ significantly but rather it seems like different companies have different approaches to how to work with the surrounding factors of these systems, discussed further down. The tools´ specific configuration is usually, as for companies as A, B, E and after an upgrade also C, a

suggestion box with possibilities to comment, discuss and in some case even group ideas and use tags. Additional functionality is found within the coming implementation at Company F aiming at the possibility to use tags to flag ideas based on if they are looked upon, taken further or how they are judged as well as being ranked based on creativity. At Company M they have the additional functionality in voting on ideas. At Company J, where they are evaluating different systems, the Concept Manager highlights a difficulty in how to handle voting. As explained one would not like to end up in a situation where only ideas that are easy to understand will get votes, leaving the real promising ones behind by being either too complex for the big masses or either cover subjects not well known. In line with this the Innovation Product Portfolio Manager highlights experience from related companies in their company group where voting has only rewarded ideas with low originality and lack of substantial business value.

Looking at the corresponding process to these systems some different facts call for mentioning. First of all, while it seems to be possible to submit different kind of ideas in these systems, some companies are or will be running these systems with outspoken strategic needs of what ideas are looked for. As the Product Development Director at Company F explains they have seen a much better quality when they have been searching for special ideas during their previous innovation events, a key learning they will exploit in their current launch of an idea management system. To search for ideas based on different themes is also looked for in Company A to increase the creativity. At Company M one has a large system in place with different idea boxes (at present almost 300 according to the Innovation Director), each calling for different types of ideas. Simultaneously the Innovation Director sees a potential in developing the boxes further and making them more specific. The interviewee also shares thoughts in line with what is mentioned above, that the more specific you become in the search of ideas the better quality you will receive. Idea competitions are also used by companies as for example E and M. At Company M the Innovation Director explains that during competitions boxes are set up, that neither are possible to look into nor giving the possibility to comment on ideas. Instead, after a set time the boxes will be closed for further ideas to be submitted, followed by the work of evaluating the contributions to find finalists. These finalists may then be given a chance to build prototypes or in some way get support in realizing their ideas.

The different idea management systems in use (and the ones about to be implemented) are also handled in different ways regarding evaluation and how to take the ideas further, where some examples are shared below. At Company C, ideas are currently sent worldwide to 25 reviewers possessing complementary competences. The comments from these reviewers then form a decision basis for the decision board, which in with the system's upgrade will get further inputs from Web 2.0 discussion possibilities for all employees. At Company A one besides already existing discussion possibilities among employees has a global cross functional evaluation committee. At company M, the system is based on that one as an employee besides being able to rate and discuss also can claim ideas for interest or action, meaning that one show interest in taking a role to take an idea further. At Company E, the Senior Business Strategy Manager describes how their global larger idea management system, in combination with their online external portals and performed online focus group events all are channels for ideas to be taken in to their local monthly gatherings. Before these events ideas are pre-screened by two persons and feedback is sent out. Ideas are also possible to comment on within an idea portal which is connected to this work process, in between the monthly gatherings. During the gathering events, the ideas are processed and idea owners get appointed. Additionally some people have also been invited to present their ideas.

A significant method around ideation is idea jams. This methodology is used within Company D, K and N, while Company G has tried it without going further but instead sticking to traditional brainstorming sessions. At Company N, the Collaboration and Innovation SME explains the jams to be connected to their global idea management system, with different idea spaces which can be seen as different silos for specific categories within geographical areas. The jam method is based on that employees, but sometimes also external stakeholders, take part of events guided by moderators where ideas are submitted, commented and voted on in real time. Based on the size, these events can be quite resource demanding according to the Collaboration and Innovation SME. The method as such makes use of a discussion space for its main activity and is distinguished from the more traditional suggestion box systems in the way that the use is limited in time and more of an event with real time interaction. The time limitation can differ though, but is likely to be for example three days, according to the Collaboration and Innovation SME. As the idea jam event is an integrated part in the idea management system within Company N, submitted and discussed ideas will be up for further discussion and refinements after the jam event is closed.

In order to take ideas further Company N makes use of catalysts. These people are part of the discussion and have the knowledge or experience themselves or have contacts in their networks which are suitable for helping out. The meaning is not that the catalyst shall come up with a solution but enable the idea to be further developed by own expertise or suitable contacts. This use of catalysts is indeed based on engagement and interest by individuals. Where ideas do not get any voluntary catalysts there is a group of people that besides of working with the promotion of jams also help out as catalysts if needed to secure the sought activity. Just like company E and M, Company N also has competitions or challenges, like for example executive challenges where executives promote specific needs and calls for ideas within strategic areas.

Another company performing jams is found in Company D, organizing similar idea jam activities as Company N with great success since 2009 in order to get new ideas from diverse groups of employees within the company. Thereby one aims to boost innovation and reduce the number of lost business opportunities due to ideas not being utilized. The Innovation Project Portfolio Manager at Company D mentions different performed jams including 500 to 1500 participants. The jams are two day events with a directed request that is communicated in advance in order to get ideas within special strategic areas. During the idea jams lead by moderators, people not only can post ideas, but within the discussion forums the main functions are that ideas can be commented on, discussed and improved. The idea jams are in these aspects similar to those performed at Company N, but a difference is found in that one at Company D does not have an open idea management system connected to the jams. Instead, after the jam, ideas that have been submitted are evaluated by the moderators and idea coaches used within the company, and the submitters of promising ones are invited to present and defend their ideas for an eventual further funding and exploration. If the idea is chosen to be developed the submitter gets an option to take part of a team aimed at explore the idea further. These teams are formed by innovation coaches and include several functions as technical and marketing expertise. The Innovation Project Portfolio Manager at Company D explains the choice of using jams, as the company's main method for ideation, as being what they thought would give the most value for money and time spent.

Related to idea jams, Company E are performing moderated online focus group events in order to get customer insights as well as harnessing the creativity of consumers. These live

events are taking place in discussion forums with around 20-30 persons per event with different events addressed towards different geographical groups of consumers.

4.1.3 Overlying Aims for Using Web 2.0 Platforms

In addition to the different aims that separate tools respond to, there are more overlying aims for the collaborative Web 2.0 platforms that are introduced. The companies that have not come that far or are about to implement these platforms and tools have their view of what they will solve or improve. What is evident is that more than one purpose usually lies behind an executed or planned implementation. Noticeable is also that innovation capabilities is certainly a driver regarding these tools but for many respondents other factors are mentioned as greater incentives for these kinds of tools.

The ones who have focused their efforts on having idea management systems in place, or are planning for an implementation, of course see the innovation as the main driver for these efforts. Simultaneously the Research and Development Manager at Company A states that the overlying strategic aim of the idea management system is growth and profitability, which then has been broken down to the need of innovations which at the lowest level requires ideas. According to the Product Development Director at Company F, their overlying goals in increased sales and profits are broken down calling for innovation which leads to the need for an idea management system. Accordingly the Principle Scientist at Company C states innovation as a prerequisite to reach their high goals regarding growth. In addition to the companies who are stating innovation as a great driver and have responded by implementing idea management systems, innovation is also seen as the main aim for the efforts within company D and their focus on idea jams. According to the Innovation Project Portfolio Manager a group within the company identified a list of ten critical innovation challenges that the company is facing and found that a number of these are definitely addressed by the methods and use of idea jams.

The Innovation Director at Company I mentions the need to follow their customers as a main driver regarding their initiatives of different forums to get ideas and feedback. Within Company O, which has a very limited use of Web 2.0, the Innovation Leader highlights that it would be really nice to use these possibilities in getting widespread different groups of users together in an easy way and reach some kind of crowd sourcing to boost the innovation capability.

From an innovation point of view the Director at Company G highlights motives in getting the whole community together by implementing these tools. The explanation is given that innovation benefits from a diverse set of people and that it is especially crucial to involve employees that are not particular experts in the area one is looking at, in order to stimulate ideation and also improve the quality of ideas and innovation. According to the Director, the situation of today is characterized (besides of no particular use of Web 2.0 tools) by a closed community where the large crowd does not even know what is going on. By the use of these tools the Director states that one can shape a more transparent workplace where you get into contact and can learn about what is going on in other areas simultaneously as you are given a chance to contribute where you have inputs to share. Additionally the transparency makes contributions visible and thereby it is easier to encourage the ones that make a difference.

Besides innovation seen as a subset of larger overlying intentions of introducing these tools, the Director within Company G mentions communication and interaction as the main drivers. As being a global company one would like to merge all these activities in all these countries.

To merge geographically spread parts of the company is also mentioned as crucial by the Research and Development Manger at Company A, stating this as being hard in the past. Similar aims are given by the Product Development Director at Company F who states the importance for them to get all subsidiary companies together trough one collaborative SharePoint based intranet solution that they are just about to implement. This will make them reach all employees and enable them to strengthen the internal communication which is of main importance, even though there are outspoken plans of using the intranet for triggering ideation as well. Not the least the Product Development Director wants to have the intranet as an aggregating starting point but with a smart interface that links to the idea management system.

As the Concept Manager at Company J explains, there is a need to get insights spread and transferred within the company in a better way than what is possible with the current, very static, intranet in order to make the information available and easy to find. Communication, coordination and knowledge sharing is also what the Scientific Advisor and Technology Intelligence VP at Company L mentions as the strategic intent for these tools in order to support the knowledge communities that are put in place. Furthermore the Research and Development Manager at Company A mentions how an intensified and open knowledge sharing contributes to new combinations and ideas as different people with their specific expertise all can see the knowledge from different perspectives. Related drivers are found in Company B, where the Sales & Marketing Business Partner mentions collaboration in pair with improved decision making as reasons behind their SharePoint upgrade.

According to the Researcher, at University P, the adoption of these tools is a response to that one has to be more agile. This is also true for companies that have come really far in their implementation and adoption of these tools as company M and N, with original general aims found in making the work process more effective. At Company N one saw possibilities to reach effectiveness by reducing the mail storms quite substantially. The Chief Technologist explains that almost all companies have limitations in how much e-mail it is possible to have. This leads to large problems and waste of time when people, sometimes on a daily basis, have to evaluate what to delete and what to keep. Additional value was seen in the possibility to make people visible outside the organization in order to show current and potential customers the knowledge possessed by the company. By exposure through external blogging and other tools as mentioned above, people can be found by others via search engines. As the Chief Technologist at Company N explains though, one rather has seen and currently sees results (as discussed in chapter 4.2) rather than having had strict predefined goals or purposes.

The Innovation Director at Company M mentions the knowledge sharing as a key for better effectiveness. This was a hot topic already some years back in time when communities based on mailing lists started to emerge, which can be seen as the starting point of the large platform of integrated tools and applications that is in use today in Company M. The Knowledge Management Manager at Company K, who has a widespread use of a company wiki and discussion forums, agrees by talking about knowledge sharing as very important. As the Knowledge Management Manager explains, their company as many others, will face a demographic shift in the next five to ten years due to staff retirements. In order to manage this shift and not loose knowledge one must connect new employees to the experienced ones. Similar thoughts are shared by the Concept Manager at Company J which is about to implement SharePoint. The Concept Manager states that people over time will be replaced and that the company also by acquisitions will gain new employees that need to be integrated in the company's communication and knowledge sharing, which to date have been built upon

informal networks. As younger employees come from a world where one uses collaborative tools in one's private life as well as in studies, expectations on these possibilities to be present exist according to the Knowledge Management Manager at Company K. In parallel with the private usage of these tools there is a big technology push in the area which at Company K is responded to by piloting and testing. Still the Knowledge Management Manager states that whatever techniques that are present, the exploitation of the tools can only be justified if they add value to the business.

Another key aspect of the need for knowledge sharing, mentioned by the Knowledge Management Manager at Company K, is that the organization does not want to spend time on reinventing things. Looking at a Company G that is working more traditionally without a big use of Web 2.0 platforms as stated above, the Director highlights that they reinvent the wheel so many times which is a costly waste of time and thereby being a great area for improvements.

4.2 Effects and Value of the Use of Collaborative Platforms

The new tools are certainly finding their way into companies and in some cases they are fully implemented with a high usage. The key question though is what value the use results in and what effects that can be seen. According to the Scientific Advisor and Technology Intelligence VP at Company L, there is a problem with measurements because you seldom have measured how it was before. This leads to that it is hard to evaluate these tools on a performance basis. Instead of looking at figures as increase in use, or percentage of reduced communication issues etcetera, the Scientific Advisor and Technology Intelligence VP states that a better way of looking at it is to see what platforms that have survived a test period for maybe twelve months. The Knowledge Management Manager at Company K states indeed that it is very hard to measure knowledge management but that they use key performance indicators for user statistics within Company K. Focusing on usage the company can show great success, already mentioned in chapter 4.1.1, with discussion forums since 15 years and with 40000 users as well as with the wiki used by 80000 persons just after around five years since implementation. Focusing on the wiki which history through previous content versions never is deleted, gives in combination with the amount of users a corporate memory of how things evolved which is a great effect according to the Knowledge Management Manger.

Despite the stated difficulties in measuring results there have been performance measurements done, according to the Knowledge Management Manager at Company K. For example some years ago they investigated discussions within a forum and found great cost savings as a result of the fact that people were provided by knowledge and fast answers which led to that they could support the daily operations in a way not otherwise possible. Looking at all forums in use this gives incentives to think that huge cost savings are realized. Another example or success story showing the interest and use of these tools are found regarding the wiki in use. The Knowledge Management Manager explains how they for example had a requirement of 50 people taking a learning course and realized later that 4500 persons had been gone through some parts of it, by self interest.

The Innovation Director at Company M has a view just in line with what is written above regarding the discussion forums and means that knowledge sharing has values beyond what one first thinks of. An example as highlighted is if you have a technical machine that is out of order and a person tries to find a solution for some days. As the Innovation Director explains, the cost is not only for the person looking for a solution for some days but rather the much higher amount of money that is lost due to the value that cannot be produced by the machine.

Another example highlighted is when problems or tasks are already solved or managed. Instead of spending time on redoing things, a tool or database that makes it possible to find documents, or frameworks for processes in an easy way can give persons possibilities to create value at some other place. With this mindset, a full implementation leading to 85 000 users of the collaborative platform including different Web 2.0 applications within Company M leads to great benefits.

The Innovation Director explains that one started to measure the effect by asking subjective questions about time saved per month by being part of a community and what extra value one as a user has been able to deliver by using the tool. This could then be transformed to quantitative values. Simultaneously one saw, as the usage increased, how one could reuse parts as for example structures of older projects. Besides, knowledge was increasingly shared between the members in the emerging communities. All in all people feel that they manage their daily work in a more effective way according to the Innovation Director. The Research and Development Manager at Company A states accordingly that knowledge sharing has been strengthened, removing collaboration problems. Moreover the use of a common SharePoint platform makes it easier for managers to work with cultural aspects of how to get teams together according to the Research and Development Manager.

Regarding Company N (which has hundreds of thousands of users of a wide array of these tools), the Chief Technologist states that one sees positive effects rather than that one has predefined goals as for example profitability, which is stated hard to measure. According to the Chief Technologist one of the most important effects with these social tools is that they increase the speed in searching for things whether it is web-pages, documents or other contents. People find things in the intranets better than ever before according to the Chief Technologist. Accordingly it may be enough just to have ten percent actively contributing with social bookmarks, tagging etcetera as these persons usually find the most valuable information for the whole organization. According to the Chief Technologist it has shown that the most updated information is found within content connected to social software rather than structured information enhanced by editors. By that not said that these functions are irrelevant but rather suitable for corporate information like human resources material. The way in which people are connected to contributions by blog posts, tags, posted guidelines, online profiles in catalogues etcetera makes it also possible when not finding the exact answers to find the persons that most likely can provide it.

Also when putting teams together, as not the least important considering innovation as being collaborative in nature, it is valuable to find persons with the right qualifications in a fast and effective way according to the Chief Technologist. This thought is shared by the Research and Development Manager at Company A, who states that the use of a common platform has made it easier to get cross-functional teams together. What the Chief Technologist at Company N states is that competent persons have a tendency to leave traces behind, useful for the search of competence. To further highlight these effects of social tools one can compare with an intranet in a company that does not have high usage of these tools. As the Innovation Leader within Company O states, they are able to use the intranet for transferring information but cannot benefit in their search for other employees. Back to Company N, the Chief Technologist states that despite the difficulty to measure results they have estimated an increase in search performance by around 50 percent. Within the company one also experiences quite an improvement regarding e-mail reduction and a substantial decrease in attachments. Other improvements, according to the Chief Technologist, are seen within areas as collaboration productivity and employee satisfaction.

In line with the thoughts of the Chief Technologist at Company N, the Researcher at University P highlights the reduction of e-mail, the decrease in threaded mail discussion and all in all a more simple and effective work process as a main improvement and as an incentive to use these platforms. Important is also that one not only reduces the mail traffic. As e-mails are invisible for others and one thereby does not receive any triggers or feedback, the move towards collaborative platforms also strengthens the sharing and interaction among employees.

Further evidence of effectiveness using these platforms is given by the Principle Scientist at Company C who refers to an increased search speed and connectivity to their use of virtual communities of practice. The dual directed flow between business groups enhance knowledge sharing which enables a faster ability to resolve issues, exemplified by how answers, tips or connections can be received almost instantly via wikis or discussion forums.

Putting focus more specifically towards ideation and innovation, tools such as idea management systems seem to give different results. At some companies as A and E, the sought effects have not been fully realized even though the Senior Business Strategy Manager at Company E states that some ideas have been realized and that the system has an important role to fill. An organization that have reached far is found in Company M, that has received 15000 ideas, 30000 comments and an implementation of over 250 ideas in one and a half year of usage. What certainly triggers creativity and accelerates the inflow of ideas within Company M is the use of competitions. According to the Innovation Director ideas generated by competitions usually stands for 70-80 percent of the yearly amount of ideas.

A picture that emerges based on the interviews is that effects beyond a measurable amount of ideas can be seen by the use of these systems. Not the least regarding the feedback that is enabled by Web 2.0 applications like discussion forums, which according to the Collaboration and Innovation SME at company N leads to an increased motivation. According to the Principle Scientist at Company C, the collective discussion does not only encourage submitters but also reduce the burden of the evaluation committee which speeds up the process. By enabling feedback these systems also increase the transparency and make people visible in the organization as highlighted by the Innovation Director at Company M. This is further exemplified by the Principle Scientist of Company C who states that it is shown which individuals within the organization who contributes with ideas and valuable comments, leading to increased motivation. A crucial effect of people taking part in the discussion as highlighted by the Innovation Director at Company M is that original ideas are refined and developed. Simultaneously the visibility of ideas leads to cross functional connections of expertise as mentioned by the Principle Scientist at Company C. In line with this these systems, over time, enable new personal networks between people interacting as stated by the Collaboration and Innovation SME at Company N.

Further effects are seen by the use of Innovation Jams as used by company D and N, even though the Innovation Project Portfolio Manager at Company D states the difficulties in what to measure and what to look for. As concluded it is easy to measure the number of ideas submitted or participants of a jam but, as mentioned by the interviewee, it is rather difficult to relate specific ideas to a final innovation or business achievement. One part highlighted though, is how the employees participating in the jams have started to think in new ways with an idea and innovation mindset. The Innovation Project Portfolio Manager means that these activities can be seen as an education, and the things learnt can then be transferred to other colleagues. Not the least, these events affect the culture, a statement supported by the

Collaboration and Innovation SME at Company N. The Innovation Project Portfolio Manager at Company D sees that the value in aspects like creativity and innovation needs to be communicated and that idea jams is a good way to accomplish this. This is stated to be especially true as it, within the organization, is mentioned to be unclear as from where to get the energy and passion needed to make you feel committed. By performing jams the interviewee sees a rise in engagement among participants and that this is affecting others as well. Not the least one sees effects during jams of how people connect over functions and regions. Also, the Innovation Project Portfolio Manager highlights how employees working at geographically remote places, where the culture is closed and hierarchical, get a chance through the jams to get their voice heard which is much appreciated.

At Company E, the Senior Business Strategy Manager sees great effects of their online focus groups. Not only that there are great ideas emerging but that there is impressive desires of customers to shape solutions and submit ideas for the wealth of the company.

4.3 Implementation, Adoption and Key Factors for Success

In order to have the collaborative tools working and delivering benefit from the usage companies must address factors of how to implement the tools and raise adoption. This can be done in different ways but several success factors seem to exist, based on the stated thoughts that are presented below. Prior to this, companies also address factors affecting whether the tools are suitable for their type of business, culture and openness.

4.3.1 Type of Business, Openness and Cultural Factors

An underlying factor affecting whether a company makes use of open collaborative platforms or not, is found in what business one is present. As the Consultant at Company H explains, when having a wide array of companies as customers which many times are competitors to each other, it is not possible to document ideas and learnings in the open way that these tools make possible. Process learnings that are separated from the customers that Company H serves are to some extent documented in a database, but most material is restricted by their clients. Instead send lists and communities, together with developed search functions, are prioritized to share experiences in a more informal way than using open documentation. The Scientific Advisor and Technology Intelligence VP states accordingly that the use of these tools is very dependent on in what business one is present. Some subsidiary companies within Company L, working within the defense industry, are limited in what they are allowed to share in an open way and have thereby developed a culture of confidentiality.

Besides which business one is part of the internal culture affects whether to make use of these tools or not. According to the Director at Company G the culture within their company is quite closed with internal barriers between different business units that have their way of working based on historical patterns, much affected by searching for patents and keeping secrets. According to the Director this plays a greater role than what business they are acting within as a reason for not yet utilizing these kind of tools especially much. The Knowledge Management Manager at Company K (a company with a widespread use of these tools) states that regardless of culture one must respond and adjust ones effort to one's own culture. As the interviewee states, one cannot copy what others are doing and what works in one company may not work in another. The culture is not static over time though. As the Innovation Director at Company M states, tools as wikis and blogs were not seen as serious when they were first introduced within the company. Over time though, by implementing the company's collaborative platform and using key performance indicators to force people to contribute and share info, the culture has come to incorporate the sharing aspect to a higher degree.

A debate related to cultural aspects and open collaboration is the one of ethics with web use. The Scientific Advisor and Technology Intelligence VP means that some people use the web without knowing how to behave which can be very dangerous. Another issue stated by the Research and Development Manager at Company A is how to get credibility of content in for example a wiki. According to the Knowledge Management Manager of Company K though, these kinds of issues are handled by never being anonymous. As the owners of the systems always can track what has been done and by whom as well as employees are keen not to ruin their reputation, vandalism and inappropriate behavior does not occur. Accordingly the Collaboration and Innovation SME at Company N cannot recall any incidents within their company, mentioning important aspects such as employees being logged in and professional as users. Focusing on Company D, the Innovation Project Portfolio Manager recalls a situation of their jams being rather characterized by too positive feedback than any misuse behavior. Originally the interviewee rather saw a need to increase the constructivism, and thereby making it more challenging to increase the development of submitted ideas.

Regardless of business, culture and individual use, the question of openness contra information security seems to be discussed within most companies prior to the use of these tools. According to the Sales & Marketing Business Partner at Company B, they need to be very careful due to customer conflicts leading to information security being treated seriously. This is true especially when working in partnerships with other companies, just in line with what has been stated for Company H above. The main trend though is that most companies, except those held back by strict confidentiality as stated above, seem to conclude that the opportunities outweigh the risk. In addition the Researcher at University P states that many employees have got tired of the rigorous security policies of the past, hindering both creativity and innovation, which has led to a desire for increased openness.

The Principle Scientist within Company C states that they believe in the openness, both regarding open innovation and transparent systems simultaneously as there is more to gain than what can be lost. At Company A long going discussions have resulted in idea management systems being open for all employees and the Product Development Director at Company F states that for them it is rather their knowledge of how to conceptualize and make use of the ideas that is critical rather than if some idea would be spread outside the intended audience. As the Senior Business Strategy Manager at Company E puts it, initial policies and regulations are slowly removed and replaced by arguments for the importance of openness and sharing. The Innovation Director at Company M shares thoughts in line with this, telling that information that one may think would not be good to have available has not been an issue. In some specific cases though, as within some company's idea management systems, there are some actions taken in building in possibilities to hide potentially patentable ideas. Within Company C all ideas are checked before made open for everyone else to look at and comment. Within Company M one had a situation like this but has changed to let the idea submitter do this evaluation and in case of a potential patent possibility highlight that when submitting the idea. The Concept Manager at Company J also highlights that they within a future system want to have a way to hide patentable ideas as well, but simultaneously states that it is a key to have the ideas visible.

While the openness seems prioritized, despite minor exceptions for the idea management systems as stated above, one still does not aim to replace all existing IT-systems with Web 2.0 tools and larger collaborative platforms according to the Innovation Director. Confidential documents and product descriptions are examples of things that rather should be put in databases, also highlighted by the Knowledge Management Manager at Company K. Others

like the Research and Development Manager at Company A puts it in a similar way, stating that their use of SharePoint will not replace databases but instead support the document management, sharing, communication and other tasks supporting the daily office work.

In addition to that Web 2.0 platforms are not suitable to replace all present IT-systems, people interviewed state that they are neither intended to replace face-to-face interaction. The Research and Development Director at Company A states that the informal physical communication is crucial but that the tools can be of great support. The Concept Manager at Company J supports this in saying that their introduction of SharePoint shall not replace the physical meeting. According to the Concept Manager it is in addition especially important to have face-to-face contact when starting up idea activities, getting everyone to grasp the intentions and what one aims for which is not that simple by strictly using IT. Rather IT-systems have a role to fill in between these kinds of gatherings according to the Concept Manager. Similar thoughts are harnessed within Company E, where the Senior Business Strategy Manager explains how they within the interviewee's department at Company E have monthly meetings where ideas are processed and in between they make use of a virtual portal for their work as further described in chapter 4.1.2. According to the Scientific Advisor and Technology Intelligence VP one first must set up teams for whatever aim or function and then one can make use of Web 2.0 platform as a valuable tool, but it does not work the other way around.

The Principle Scientist at Company C also highlights the need to have the possibility to work systematically with one's ideas and shape an interest around them which is absolutely crucial and something no system can replace. When that possibility is in place the right qualitative ideas will follow. Looking at Company O, a company which is not utilizing these tools, the Innovation Leader states that the internal processes of developing ideas is working with great success. All in all, this highlights that whether one makes use of the tools or not, an overlying culture and systematic methods are crucial to develop the ideas.

4.3.2 Implementation Pattern

Regarding the implementation of these tools and platforms they originate from initiatives on different levels in the companies as will be explained by some examples below. Additionally different tools or systems within the same company may be a result of different initiatives. Looking at Company C, the Principle Scientist states that their implementation of communities of practice has been based on visions from above while the implementation and development of the idea management system rather has been driven at a lower level. At Company F, the Product Development Director explains their efforts as a result of middle management taking advantage of knowledge and initiatives from below being discussed for alignment with top management. Additionally, to reduce the risk of resistance they are involving all business units and are using cross functional forums to have it well rooted. Looking at other companies like E and I, initiatives and implementation are growing more or less solely from below. This is the situation at company J as well, where the Concept Manager describes a situation where it is needed in their implementation to over time show value and results in attempts to get help from top management.

At Company M, the Innovation Director describes own efforts at a grass root level with mail lists, leading to a growing development of communities which can be seen as the starting point of the company's fully implemented global collaborative SharePoint based platform of today. The Innovation Director states that they have had to show and convince the management that the developing tools were working to get support from above. When results

could be shown though, it was possible to take one step further up in the hierarchy which over time led to full implementation, enabled by the supporting activities from the top. The implementation of different Web 2.0 platforms within Company K has been and is characterized by a strategic support and central ownership by the learning function within human resources. The coming platforms are also supported by the IT department as well as implementation teams out in the businesses. While the Knowledge Management Manager highlights that higher management within a decision review board is involved in roll outs, there is a need to have people at the ground with passion and a belief to reach success. So endorsement from leaders and activity from the ground, leads to that the Knowledge Management Manager summarize the company's efforts as tackled both top down and bottom up.

At Company N the Chief Technologist explains their journey regarding Web 2.0 originating from visionary leaders some years ago starting to spread the needs to make use of these tools. The global implementation have since then had a top down support, not the least by high level advisors articulating when there is a need for better tools and preparedness from functions as CIO office, marketing and communication. To have a top down support is according to the Chief Technologist an extremely important but often missing part within many companies. In addition to top down support within Company N there have been evangelists at lower levels with special interests who have taken personal roles in spreading these tools. As an example when it was communicated from above to start with blogs and wikis, initiatives came bottom up that there was a need for file sharing as well. These types of bottom up initiatives have then got support from the top and according to the Chief Technologist become part of higher management's agenda as well.

While the Researcher at University P states that the adoption of Web 2.0 platforms always start from below, the Scientific Advisor and Technology Intelligence VP at Company L states that a full implementation at a company with 10000 employees or larger is always done top down. The examples described above without mentioning the implementation for every single company that has been interviewed show on different ways of implementations. What is clear is that in the last three cases, for company K, M and N which all are large companies with widespread use of these kinds of tools, there have to a different extent at different stages been a top down support even though one had to work harder from the bottom to reach support within Company M.

Looking at the different companies, Company K seems to be one of few companies where human resources play a real central role. Another company where human resources is involved is within company L where they are members in interdisciplinary teams supporting and looking after questions regarding these kinds of tools together with other functions. Human resources seems also to be involved in training programs in some companies as touched upon further down. According to the Researcher at University P, the human resources function has a role of being part in how to put up guidelines and policies regarding how to make use of these tools.

4.3.3 Adoption, Barriers and Key Factors for Success

Whether the implementation being characterized by a top down or bottom up approach it is crucial to get encouraging influences from the top in order to reach critical mass. This is highlighted both among those that have come far and the ones experimenting or struggling with adoption. According to the Chief Technologist, one success factor in how Company N has reached their great success has been to have leaders that are blogging themselves. Also

the CEO of the company has taken part in discussions within blogs. Regarding Company M which is another company that has reached far, the Innovation Director states that their CEO is blogging, followed by many employees. Not the least the Innovation Director sees a value in this to have middle management supporting the use of these kinds of tools. Initiatives from beyond are not otherwise as likely to get attention from middle management. A situation like this is present at Company J where one has not made great use of these tools yet. The Concept Manager certainly states that top management has an understanding and talks about collaboration and innovation. A barrier is seen though, in that the middle management still has to perform on quarterly basis and that even if intentions exist there is no time to prioritize these platforms. Accordingly the Senior Business Strategy Manager at Company E states that they lack persons in top management that are blogging or using a micro blog in order to influence. If this had been utilized the Senior Business Strategy Manager thinks people would have been more interested to take part, which currently makes this an area of improvement. Sometimes also top management needs help, according to the Researcher at University P. A valuable action for management is to get consultancy help in how to use these tools and for example learn how to start up with a blog that looks great. This would withdraw the barrier of top management not knowing how to contribute even if they want to.

Besides support from the top it is, according to the Innovation Director at Company M, important to experiment and test different forms of tools and methods. Within their organization there are quite a few examples of communities that have died out, but that must be okay according to the Innovation Director. This is supported by the Scientific Advisor and Technology Intelligence VP stating that it is hard to know in advance what will work or not. Thereby one shall test and experiment and see what is alive after twelve months rather than measuring something that cannot be measurable. When it comes to testing and performing pilot projects the Research and Development Manager at Company A highlights the importance of the pilot group constitution and the need for incorporate people that are not IT experts.

According to the Researcher at University P, the ones succeeding in the area of collaborative tools are mixing new additional software and methods usually based on bottom up initiatives with existing or new overlying systems. This gets indirect support by the Scientific Advisor and Technology Intelligence VP of Company L who sees a problem in that IT-departments usually have a fixed mind regarding that a chosen platform must be the central point for ever. One example of many is found in Company D, where the Innovation Project Portfolio Manager highlights how they are locked to the SharePoint platform and accordingly highlights how the wiki and blog functions in these tools are not good at all. This is supported by both the Research and Development Manager at Company A and the Researcher at University P stating especially that the wiki in SharePoint is neither intuitive nor encouraging. Still though, many respondents as the Scientific Advisor and Technology Intelligence VP of Company L as well as the Senior Business Strategy Manager at Company E state that the issues of these tools at a general level are not about technology but about how you are handling the work process around them.

According to the Innovation Director at Company M one must be aware that it takes time to implement and reach high level adoption of these kinds of systems and as the Concept Manager at Company J puts it, it does not happen by itself. This is shared by the Chief Technologist at Company N stating that the tools will not be used automatically and to see results one needs to make the implementation right. Important is that one must train newly hired employees and the ones that are not used to these tools. At Company N one partly is

responding to this by being pioneers in writing guidelines for the usage of Web 2.0 tools. Others trying to educate their employees are found in Company L, where human resources have some training programs and within Company M where the same function is introducing the tools to new employees. Examples of learning initiatives are also found at Company K where they have put out self help of how to write in wikis, like online training material where you can learn before using it sharp. This helps and at the company there is a steady increase of usage. Evidence of its value is shared by the Knowledge Management Manager stating that out of 50 people required to take a course, over 4500 had made use of some parts of the course valuable for them.

Besides education in how to use the tools it is, according to the Chief Technologist at Company N, important to show at the value of using these tools in order to have people motivated to take part and contribute. This is shared by the Research and Development Manager at Company A stating that one must communicate and explain why to use these tools and what value they have for oneself. The Concept Manager at Company J also highlights the importance of identifying the people that directly are willing to contribute and take part in the use of these tools in order to boost the adoption. A little trick used during the implementation within Company M was just to let some specific knowledgeable people be part of the original communities within the company, in order to shape a desire and give the communities a certain status and traction.

Regarding the interest for these tools among employees within the represented companies in this study it is hard to see any clear picture. According to the Principle Scientist at Company C one sees cultural differences depending on what geographical region you are from. Some then, as the Research and Development Manager at Company A states that it is rather individual interests and computer knowledge rather than age that determine whether you are interested in these tools or not. Others like for example the Director at Company G states the interest among young people be extremely high and almost none existing among older ones. Differences are also seen in the average interest, where quite a high interest is seen within Company B while the Concept Manager within Company J says that there is quite a large resistance as a large number of people do not understand what value the tools have. As stated by the Concept Manager, many managers think one shall focus on daily operations instead of working with ideas and here there is work to do. This view is shared by the Research and Development Manager at Company A in the way that many people see the use of these tools as just another burden in addition to everything else that shall be done which results in a weak adoption.

To address these issues, the Concept Manager of Company J thinks one must force people to use the tools in a way to reach common practice. The Concept Manager exemplifies this idea by stating that everyone maybe should spend ten minutes every morning on the idea management system. At Company M they have made use of key performance indicators, stating that one should contribute with a certain amount of content, in their present overlying collaborative work platform. While the Innovation Director says that it led to that much crap was submitted and that contribution was based on quantity rather than quality, this led to higher demands regarding rating and search functions and the system was over time evolving as usage increased. At that time the Innovation Director recalls it to be frustrating, but when looking back on the process it was a way that obviously worked to get people use the new tools within the platform. Simultaneously the Innovation Director states that there are probably other ways of doing it. Regardless of what method to use, the Researcher at University P states that the tools must be part of the daily work and it is not enough to just

provide a platform but it is an ongoing journey that takes time. What counts is to be able to show examples of success and that people are sharing experiences of great usage and teaching others. According to the Research and Development Manager at Company A it is important that one has some ownership of the tools and that there is a face and someone to contact instead of just an anonymous system.

Of main importance is additionally to set up an environment where people have a mutual respect and trust each other. That allows them to have an open communication and go beyond the company based interest and look more into the knowledge base interest. This is a top priority success factor according to the Scientific Advisor and Technology Intelligence VP at Company L which requires lots of work together with human resources department.

According to the Innovation Director at Company M it is also extremely important to shape trust in people so they are willing to share their ideas. It is important to eliminate the fears of people getting their ideas stolen and instead have people, connected to the system, that can act as coaches aiming to help people have their good ideas developed. Accordingly it is valuable to offer the persons to take part in the journey of developing their ideas, which is a great way to increase personal skills and knowledge. If the possibility to be part of the development of one's ideas does not exist, the Innovation Director states that people are not likely to submit any ideas. At Company D, the Innovation Project Portfolio Manager highlights how it within the company did exist a feeling of fear to originally submit information to wikis which has made it troublesome to keep the tool alive. When one is afraid of others getting credit for what one self has submitted, one is not likely to share knowledge and this destructive behavior must be addressed even though it is a challenge to know how. Within Company D one has tried to respond by setting up guidelines such as when starting up a project you must share the info via the wiki, according to the Innovation Project Portfolio Manager.

4.3.4 When Value Occurs

To deliver real business value with these tools you need a certain amount of participation. If not, the value result will not come. According to the Senior Business Strategy Manager at Company E, their use of the web does not result in the benefits it has potential to lever as there are too few interested participants which leads to that the critical mass is not achieved. As the Senior Business Strategy Manager states, everything outside the workplace is done through the web, but when entering the office and using the intranet low value is gained. Others like the Research and Development Manager at Company A states accordingly that regarding their idea management system they have not reached the needed interest to deliver the traction needed. Other companies like K, M and N are reporting great effects but do also show real large user participation.

The question is when critical mass occurs and what amount of participants that is needed. According to the Innovation Director at Company M, referring to their implementation it was crucial to get past the stage where the result of having key performance indicators forcing people to share content turned from initial forced low value content to a knowledge bank of valuable material. When the critical mass is achieved the process becomes self generating according to the Innovation Director, today having people claim these tools to be in use.

What specific amount of people that is needed for different tools to work may differ but according to the Innovation Director a community needs a core with maybe ten to twenty persons surrounded by a 100-200 listeners to be working. Within the core group special competence emerge which shapes interest around it and has the communities grow. According

to the Scientific Advisor and Technology Intelligence VP the real important part is rather to reach the nodes in the network than a specific amount of people in general. These nodes are well respected, knowledgeable individuals that have numerous connections having information to flow fast. This is supported by the Research and Development Manager at Company A, stating it is important to find the right persons, the ones that get the things going, rather than to reach a certain amount of users in order to have these systems valuable.

4.3.5 Tool Related Success Factors

Besides success factors of general usage of overlying Enterprise 2.0 platforms, success factors for some specific tools have been elicit as well.

Discussion Forums

According to the Knowledge Management Manager at Company K the key in handling discussion forums is moderation and ownership of the communities where one makes use of the forums. Accordingly it is crucial not to have too many communities and to have a process to close down the ones not working and to support the successful ones so they continue to prosper. In order to do this it is good to have a moderator at an overlying position looking after the different content owners. Ultimately there is a need not to leave the managing of discussion forums to faith but instead work with moderation to support the adoption.

Blogs

A key factor mentioned by the Knowledge Management Manager at Company K regarding blogs, is to have them present at a central location making them easy to find. At company K one can search for blogs in the main portal, otherwise they will be all over the place and people will not find them according to the Knowledge Management Manager.

Wikis

A key aspect for the wikis related to the previous chapter of critical mass is, as highlighted by the Knowledge Management Manager at Company K, to have a certain amount of content present within the wiki to make it valuable. Without content it is hard to make people participate which is needed to further develop the wiki and drive adoption. Besides having an amount of content present, it is crucial when handling wikis to have content owners, who must be replaced if they move on to some other position. The reason for these content owners to be present is according to the Knowledge Management Manager that one does not want to end up in an environment looking like many intranets with outdated material and pages all over the place. All in all the Knowledge Management Manager at Company K states that the technique is not enough by itself but needs moderation and ownership of the process.

While Company K is using a separate wiki function and has reached great success, some of the ones using the wiki application in SharePoint are facing challenges in the interface. Examples are found in company A and D as touched upon in chapter 4.4.3, and these companies are also making less use of the tool. According to the Research and Development Manager at Company A it is also hard how to relate to the unstructured approach of just submitting content that becomes generally searchable within the wiki, in contrast to the more traditional file structure people are used to. This calls for a need to educate the users and in order to stimulate usage a system with indirect monetary rewards is used.

Tagging

Regarding the use of tagging, the Innovation Director at Company M highlights that there is a delicate choice in how detailed the tags should be. Either one makes the tags very detailed which is good for the search possibility but leads to too much work for the employees which results in that no one will use them, or else using less detailed tags which makes people contribute but being of less value for the search engine.

Idea Management Systems

When considering idea management systems the Researcher at University P states that it is crucial not just to think that one starts up a box and is satisfied by that. As the functionalities between different systems do not differ that much (it is usually a box with discussion and voting possibilities) it is how one works with the platform that is important. One crucial thing, according to the Researcher, is to get feedback as an idea submitter in order to feel that one contributes. The same thoughts are shared by the Research and Development Manager at Company A, stating that their initial idea of just providing a tool that would lever intended benefits was proved to be wrong. Even though people may have ideas they will not submit them if one does not work with the platform. Important is that people must get feedback and see that there will become something of their ideas. Otherwise it does not matter how enthusiastic people are and how many ideas they initially are submitting because it will die out over time when nothing happens. The same thoughts are shared by the Senior Business Strategy Manager at Company E, stating the importance of avoiding the black hole. To make sure the idea submitter experiences that there is some activity and feels motivated to contribute, the Collaboration and Innovation SME at Company N, states that there is a need for a loosely composed group with engagement which takes ownership of the system. Accordingly the Innovation Director at Company M, where there is quite a high activity, states that they probably can be better in following up and showing that the system is active as still many people think it is just another black hole.

In addition to feedback, the Researcher at University P, states that one needs to have a communication plan around the idea management system. There should be campaigns with special needs addressed which also is being highlighted by the Innovation Director at Company M as well as already touched upon in chapter 4.1.2. At Company C, the Principle Scientist supports this need, and also states how the CEO and some managers within top management at certain occasions are articulating what their dream innovations would be, which not only has resulted in an increase in quantity but also the quality of the ideas become higher as a result of this. More on, according to the Principle Scientist, it is important to make people visible in order to increase the interest of having people to contribute.

Company C responds to the need for visibility by interviewing persons who by the evaluation committee are considered to be great idea submitters and then put the interview in an internal magazine. This method is also utilized within Company F where the submitters of ideas that are taken to market are rewarded with an article. The Product Development Director at Company F says they have chosen this approach as they do not believe in any connection between work effort and monetary rewards. This is otherwise used by Company C as complement to the interviews within their magazine. According to the Principle Scientist different monetary prizes are present for ideas of special value based upon predefined criteria. Other examples of rewards are found within Company M, where winners of idea challenges connected to their idea management system are rewarded with support to build a prototype that can be at display during innovation days. A submitter of a good idea can also get rewarded with time, money and other resources to develop one's business idea. The Concept

Manager at Company J sees a need to reward cross collaboration and that one shall be encouraged to submit ideas together with others, preferably over department boundaries which can be specifically valuable.

Idea Jams

Regarding the idea jams performed at Company D, no additional rewards are used but the Innovation Project Portfolio Manager highlights that the joy of taking part and getting feedback is rewarding in itself. To build momentum and shape interest around jam events the Collaboration and Innovation SME at Company N sees a critical success factor in how they invite a well known profile in the company in order to raise the participation. This is really important in the marketing of the events and when people see these invited key persons taking part, submitting ideas and commenting it raises the interest. A success factor regarding the marketing of the idea jams, according to the Collaboration and Innovation SME, is to spread success stories via blog post.

5. Analysis and Discussion

Within this chapter the empirical findings will be analyzed with the aim of finding answers to stated research questions for this thesis. In order to accomplish this, key empirical findings will be matched upon corresponding theoretical statements in order to find whether the parts support each other or differ. The chapter will be ended by a discussion of how the Web 2.0 tools and systems can address the previous and current issues within the field of knowledge and idea management as described in the theoretical framework.

5.1 Platforms in Use, Stage of Implementation and Strategic Intents

As a result of the qualitative character of this research the empirical findings are not proof enough to present quantitative values of which tools and platforms that are the most used in general. Still though valuable patterns can be seen of what platforms companies are making use of as shown by the analysis in the following subchapters, based upon the 4 Cs approach presented by Cook (2008). Before going into the specific tools though, the overlying strategic intents for these tools need to be analyzed.

Different strategic intents behind the implementation of Web 2.0 platforms have been highlighted by the interviewees. Some of them describe their company's implementation of Web 2.0 tools and idea management systems as responses to top management goals of increased growth, sales and profitability that are broken down to lower level goals as improved rate of innovation. Others describe the implementation more directly being aimed to address lower level aims of effectiveness, including e-mail reduction and increased search capabilities. More on support for knowledge management initiatives by enabling tools supporting communities of practice are aimed for. The Researcher, University P, also explains the bottom up increase of usage as a response to the need of being fast and agile to deal with the work environment of today. Elicited overlying aims are similar to research findings by Corso et al. (2008a), stating that Web 2.0 tools respond to the need for open belonging, social networking, knowledge networks, emergent collaboration, adaptive reconfigureability and global mobility, all ultimately intended to support flexibility, adaptability and innovation. Without finding alignment in every aspect the comparison of theory and empirical findings gives unquestionable direction to what issues these tools are intended to solve.

5.1.1 Communication

Some of the most used tools within the companies looked upon in this study are what Cook (2008) refers to as communication tools. To start with, discussion forums are used within a majority of the companies, with several different aims though. First of all these forums are used in different idea management initiatives as facilitators for customer interaction through online forums, as communication enabler during idea jams and as a feedback and discussion platform connected to idea management systems. Secondly, for knowledge management purposes discussion forums are used as the fundament in different communities, sometimes referred to as communities of practice (Brown & Duguid 1998). The discussion forum is according to Wagner & Bollojue (2005) a very mature platform, supported by not even being present at the Gartner Hype Cycle curve (Landry 2010). Regarding the investigated companies an example of the tools being very mature is found in Company K, where the tools have been used as an enabler for their communities of practice since 15 years back in time.

Another communication tool in use by a few is social presence, especially used as a micro blogging platform. This use is also highlighted by Cook (2008). At Company K one is piloting the micro blogging, in their case Yammer, as an attempt to find a more lightweight approach than the discussion forum, by Cook (2008) considered as heavily formal. Within

Company N micro blogging is used to share ideas and interesting information while it within Company E is used for quick questions and answers. According to the Researcher at University P micro blogging platforms, especially Yammer, is benefiting from ease of use with almost no entry barriers leading to exponential growth. According to Landry (2010), the micro blog has past the peak of inflated expectations at the Gartner Hype Cycle and is now a standard feature in SharePoint 2010 and Lotus Connections. Social Presence, not regarded as a micro blog platform is significantly more mature, positioned at the plateau of productivity.

Blogs are a communication tool used within most of the investigated companies. While some make use of blogs for marketing purposes towards customers others are using it for internal thought provoking and marketing for events like idea jams. In many cases blogs are used by management, in some cases also the CEO, as a way to influence the organization. As a communication tool within Company K, the tools are articulated to be used for one way communication while discussion forums are intended to be used for two-way communication. According to Muregesan (2007), blogs can be used as a two-way communication tool as well. Blogs are very mature tools, not the least highlighted by the fact that it is one of the first tools used within Company N, considered as a leading user of Web 2.0 tools. The maturity of the tool gets support by the Gartner Hype Cycle curve placing the tool at the Plateau of Productivity.

Instant messaging or chat functions are mentioned by few of the interviewees. Within Company N it is one of some tools that have a stated aim to reduce the mail volumes. While chats being mentioned to be present in other companies as well, like Company G, it does not seem to be the most used Web 2.0 tool though. Still, according to Cook (2008) there is yet a growing trend to use this tool within businesses. From a maturity perspective one can state that the tool is mature enough not to be highlighted on the Gartner Hype Cycle curve (Landry 2010).

5.1.2 Cooperation

Cooperation tools are not that widely used among the companies investigated. Regarding the use of media sharing it is highlighted to be present within companies like F and K, where they are used for educational purposes. At Company K one both makes use of posting video in the wiki site as well as webcasting informal events while one within Company F uses video sharing for education. Another cooperation tool is social bookmarking, only highlighted to be in use within Company N. Within the company the bookmarks you share are considered to give a map of interesting sites and can simultaneously be tagged with comments. This usage is in line with what Cook (2008) states to support employee contributed corporate intelligence by suggested relevant information that is shared with others. Only having one company using this tool seems accurate, as social bookmarking just has passed the peak of inflated expectations, being situated in the early phase of the trough of disillusionment at the Gartner Hype Cycle curve (Landry 2010).

5.1.3 Collaboration

The only collaboration tool in use within the investigated companies is wikis, used by quite a few. Major usage is found within Company K (having 80000 users), utilizing the tool to build an encyclopedia of company knowledge which is served by a robust and effective search engine. Several other companies are trying to build up similar or smaller more specific knowledge banks for community use, in some cases still at a stage of experimentation. The use highlighted by empirical investigation is in line with theoretical statements. According to Tredinnick (2006) wikis are suitable for collaborative authoring which over time is building up a credible and stable information bank, supported by built in search engines enabling the

search for specific information as well as for more general topics (Murugesan 2007). While the wiki within Company K (introduced four years back in time) is a standalone tool others (many with quite recent implementation) are using wikis as a built in application in SharePoint or Lotus Connection. Looking at the Gartner Hype Cycle curve, wikis are considered being proved technology situated at the middle of the Slope of Enlightenment (Landry 2010).

5.1.4 Connection

The use of connection tools is emerging as companies are starting to realize the value of how to connect and build networks. Regarding social networking as a tool, some companies are to different extents making use of software from the private sphere as Facebook and LinkedIn with the aims of connecting externally, strengthen customer connections and making use of marketing and recruitment possibilities. Others, like Company N, is making use of social networking possibilities internally through their overlying Lotus Connection collaborative environment with the aim to find people with competences and experiences that one can collaborate with by sharing ideas and knowledge. This is true for several other companies as well, using the possibilities embedded in overlying SharePoint platforms as competence profiles, search functions etcetera in order to set up, develop and support communities of practice. This use is in line with the description by Bughin (2007), stating that social networking aims to enable people to learn more about other employees, their skills, talents, knowledge or preferences which ultimately leads to identification of experts. Levy (2009) argues that several applications as blogs, wikis, RSS and tagging also support the networking. This makes social networking in a company context less tool specific, making it hard to evaluate the maturity as connected to a special technique. Still though, one can mention the use of online communities of practice in use since 15 years back in time within Company K as a proof maturity in the practice of connecting experts.

Another connection tool is tagging, not that widely in use regarding the companies that have been analyzed. Within companies as N and M though, tagging is used. Examples of usage are found in classifying different stored information, social bookmarks and social online profiles. The ultimate aim within both these companies is to speed up the search for persons as well as content. As Levy (2009) describes, tagging is the fundament for new connections and links between various content. Despite few interviewees highlighting the tagging aspect it has, according to the Gartner Hype Cycle curve, at least reached the middle of the Slope of Enlightenment and is considered to give high benefits for companies (Landry 2010).

Almost all interviewees are pointing out the search or social search function to be crucial, which does not mean that all companies are making use of social data within their search engine. According to McAfee (2009), it is always easier to search on the internet than on corporate intranets. This improvement potential is recognized by many companies, looking into possibilities to strengthen the existing search capability over time by adding social search aspects. One way of doing this, highlighted by quite a few interviewees, is to implement or upgrade SharePoint including enhanced possibilities for increased search performance. Even a company as Company K, having a robust well functioning search engine as part of their widely used wiki is investigating search improvements within their upgrade to SharePoint 2010. Regarding the stage of implementation, traditional search engines are very mature techniques while most companies seems to be investigating social search even though companies as for example Company N has this in use. A limited full scale use seems to be in line with the Gartner positioning of social search at the Hype Cycle, where it is evaluated to be positioned at the very beginning of the slope of enlightenment (Landry 2010).

Syndication via RSS feeds does not seem to be used to any larger extent. Notifications of updated information through corresponding alerts within SharePoint based systems are in use though, not the least mentioned to be of great value within Company M. In some other companies e-mail notification is used to make people aware and engaged of updates in idea management systems or discussion forums within community of practice. Regarding pure syndication, Cook (2008) highlights how RSS feeds push consumption in a way shaping positive feedback loops. This statement is aligned with notifications mentioned above aimed to increase the activity within different collaborative environments. While examples are found of e-mail notifications as well implemented within companies, the limited use of RSS feeds seems to be supported by Gartner Research stating personal subscription via RSS to just have reached the beginning of the trough of disillusionment (Landry 2010).

Mashups, as rather being a technique to aggregate different feeds and content on an intranet, SharePoint or Lotus Connection site is indirectly mentioned to be utilized and well implemented as companies are using these overlying platforms. As mashups can be seen as a supporting technique rather than a collaborative tool its maturity is not covered in Gartner Hype Cycle research. Theoretically, mashups are by Murugesan (2007) stated to enable a better way to navigate through information and increase the relevance in combined data.

5.1.5 Overlying Collaborative Platforms (ECM, Groupware)

An empirical finding is that most companies are making use of Web 2.0 tools as applications within larger overlying platforms, a fact which is not that clearly described in most literature. The preeminent most common platform in use among companies is SharePoint, while the corresponding Lotus Connection platform is in great use within Company N. Also Company K, which currently is having a widely used wiki as well as blogs and discussion forums as separate functions, are investigating future aggregation within their emerging use of the SharePoint 2010. Strategic aims for the use of these platforms are mentioned to be found in the need of aggregating widespread companies enabling global collaboration. Not seldom, the platforms chosen are linked to strategies developed together with the IT-departments. Within these overlying enterprise content management systems or groupware many companies, with examples in, C, L, M and N, are utilizing the built in support to set up communities of practice as described in chapter 5.1.1.

Regarding the stage of implementation of these platforms, some companies have built up heavily customized systems being in use since some years back in time. Others are planning or are just about to implement or upgrade to a newer version of these platforms. Based on the aims described of aggregating the companies' information the implementations are dominantly global. According to the Gartner Hype Cycle curve, these platforms are not considered to be more mature than being well into the trough of disillusionment, still though the technology is viewed as proven (Landry 2010). The empirical findings show that almost all companies have these platforms in use or are about to implement them indicating maybe a greater adoption than the Gartner research shows.

5.1.6 Idea Management Systems (Corresponding Methods) and Idea Jams

Web 2.0 applications also have an additional role in adding functionality (discussion, commenting, rating and voting) to what in the past could be considered as quite simple suggestion boxes, but over time as Sandström & Björk (2010) mention have been developed to more sophisticated systems. The strategic intent for the systems as such is not surprisingly to boost innovation by capturing people's creativity through idea submission. The additional Web 2.0 functionality serves as a complement to (or replacement of) review boards, with the aim according to different interviewees to support the collaborative possibilities regarding

feedback and development as well as to enhance cross functional connections. The underlying reason for these aims gets theoretical support by Lindegaard (2010), stating it crucial to follow up idea submitters by giving feedback and having an ongoing communication. Regarding the stage of implementation, older suggestion box systems with related review boards or committees are a mature phenomenon mentioned by many interviewees. When it comes to more sophisticated systems supported by interactive Web 2.0 technology the maturity is not as striking. About half of the respondents have or are about to implement these kinds of platforms. Among these that already have done it, some are having a high usage as a result of a full scale implementation while others are struggling with the usage rates needed to have the platforms prosper. Regarding the Gartner Hype Cycle curve, these systems are reviewed to be in the end of the phase of trough of disillusionment (Landry 2010).

Another method rather than platform in use within for example companies as D, N and K is idea jams. These moderated online ideation sessions where ideas are submitted, discussed and developed are based on discussion forum technology. The aim is to capture a great amount of ideas, establish connections between people and affect cultural values to improve knowledge and idea sharing in the general work process. The idea jams are standalone events that can be connected with an idea management system as within Company N. Similar to idea jams but including significantly fewer people are online focus groups performed within Company E, aiming at customer insights and ideas. Regarding the maturity of idea jams, they are not covered in Gartner research. What can be said is that the method is definitely used at full scale implementation leveraging real value, at company D being used for two years but within Company N being used for many years.

5.2 Effects Derived from the Use of Collaborative Platforms

As stated in chapter 4.2, many respondents have highlighted that it is hard to measure results of the implementation of collaborative platforms as one is not sure on what to measure against. Still though, several effects based on the use of these tools have been articulated during the interviews. First of all Company N, as being a heavy user of Web 2.0, reports a 50 percent increase in general search performance (including content, experts, people). This increase is both seen regarding speed as well as relevance. Additionally within Company N one has also seen a significant e-mail volume reduction, not the least characterized by fewer attachments. According to the Researcher at University P this is one of the key improvements working with collaborative platforms.

Based upon good social profiles and search technology another effect seen within Company N is with the increased ease one can put together teams with the right mix of competences. Within Company C the use of social profiles and search capabilities enhanced by a SharePoint platform, with community of practice environments in place, also increases the search speed and connectivity to experts within the company. This leads ultimately to improved knowledge sharing and fast answers upon asked questions. The value of fast response to questions and access to knowledge is also seen as a result of the communities of practice within Company K, where measurements made have shown huge amounts of money being saved. Further proven effectiveness is reported from Company M, where increased speed in solving problems and a possibility of reusing shared knowledge and material saves lots of money. Finally, as reported by company A and C, the use of platforms as SharePoint including Web 2.0 applications supports cross collaboration.

A key question is if stated empirical effects of using Web 2.0 are being widely experienced or not and if they are valid as general conclusions. The answer to this question is found in

quantitative research performed by McKinsey. This research concludes that the mostly widespread improvements realized for internal purposes are found in increased speed of accessing knowledge, reduced communication cost and increased speed of access to internal experts (Bughin & Chui 2010). When matching these findings with the effects elicited in this thesis it shows that the first and third most widespread effect shown by the McKinsey research also is explicitly mentioned to be true within several of the investigated companies within this study.

Additionally, the McKinsey research shows other effects not found in the empirical findings within this thesis. These effects are increased satisfaction among employees and an increased number of successful innovations as well as other effects regarding customer related purposes and ability of improving the work process with external partners and suppliers (Bughin & Chui 2010).

What shall be mentioned is that while several effects are shown within the investigated companies in this thesis, also some companies are lacking effects. This seems accurate as McKinsey research for 2010 shows that as many as 79 percent of the respondents in their survey do not benefit significantly from the usage of Web 2.0 (Bughin & Chui 2010). Of additional value to mention is that the McKinsey research shows how the fully networked companies are the ones benefitting most of the use. This is in line with the empirical findings of this study showing on how companies as K, N and M, all with widespread use of the tools are also the ones benefitting the most.

Looking at idea management systems in use, they have diverse effects. For some, as Company M, they enhance a great number of ideas submitted while they for others have not yet fulfilled their aims. Focusing on the use of Web 2.0 applications within idea management systems, they enable further results. Discussion and rating possibilities result in increased feedback as well as making people visible in the organization, which ultimately increases the motivation of people to further submit ideas and participate. These results are seen in Company N, where also personal networks have been built up over time due to collaborate discussion possibilities. Additionally, one within Company N as well as M sees effects in that the ideas become refined and developed. Furthermore enabling employees to comment and discuss reduces the burden for review boards or committees to respond to all idea submitters.

Regarding the use of idea jams, not only great amounts of ideas are generated. As seen within Company D the jam events also make people think in new ways and have them to take on an ideation and innovation mindset as a part of a cultural change. Further effects are seen in the rise in engagement of participants and how they increasingly are making connections over geographical boundaries as a result of the jam events. Finally one shall mention how Company E by their online focus groups, which can be seen upon as small jam events, are benefitting from the numerous ideas created.

5.3 Key Success Factors for Implementation and Managerial Implications

To reach beneficial effects of the use of Web 2.0 platforms, several factors regarding implementation and adoption must be managed in a suitable manner. As will be shown in this chapter the theory and empirical findings are for a vast majority of these factors aligned in what actions they claim are leading to positive effects. The fact that McKinsey research for 2010 shows that still 79 percent of the respondents are struggling with their efforts of acquiring positive results, highlights the need to manage the implementation in the right way (Bughin & Chui 2010). Previous to implementation one also must address whether the tools

seem applicable for the organization or not. Greatest results of using Web 2.0 are, according to McKinsey research, large high-tech business-to-business firms finding great support in this thesis with examples in the large high-tech firms of Company M and N. These largely networked companies are not only making use of isolated tools, but are harnessing the possibilities of the SLATES concept presented by McAffe (2009). Here the search functionality is making use of the tags and links put on authored and processed material, updated by personal subscriptions that ultimately all together leads to the gains observed. The empirical findings for this thesis also prove that some other companies are being limited by which business they belong to as L (defense industry) and H (consultancy business).

Whether the business one is present within is hindering efforts using collaborative tools or not, the question of information security contra openness is an issue discussed by most companies. As McAfee (2009) states many companies fear leaks of secrets, lost control and social misuse of the possibilities but are consequently not considering the opportunities, nor taking into account that people will not be anonymous using these tools and that people in general know how to behave. The reality, looking at most companies in this study, is that while these issues and especially the ones regarding leaking secrets are considered, the opportunities are concluded to outweigh the risks. In line with the arguments of McAfee (2009), both in Company K and N one is highlighting that people are not anonymous on the internal web. Taking idea jam events at Company D as an example people are rather too polite against each other than the opposite. To conclude, it seems like companies investigated for this study are more keen to open up security boundaries than the general view of management as presented in theory. One could argue that this may find its answer in the interviewees having a biased view, most of them working close to innovation, but the reality is that the tools and platforms are in use which undoubtedly shows that an increasing amount of companies are opening up their working environment. As Hinchcliffe (2007) states the Enterprise 2.0 will be utilized whether management wants it or not but by guiding the adoption and implementation greater benefits can be achieved.

The question that follows is what factors must be addressed by management to reach success. Crucial according to McAfee (2009) is to increase usage of the tools, as usage rate being directly related to company satisfaction and experienced benefit (Bughin et al. 2008). This is also proven to be true by empirical findings, having examples in companies as A, B and E being challenged by less contribution within their idea management systems than hoped for leading to limited results. On the other hand taking companies as K, N and M, they are with their high usage benefitting from great results over a wide array of tools. Why enterprise user adoption is so crucial is based on the observation of the internet where certainly huge amount of people are contributing, but seen as a percentage the contributors are few. Taking the same percentage of users to an enterprise context with limited number of employees the result of using wikis and forums would be really limited as supported by Tredinnik (2006). With adoption as the way to reach success, management can then act strategically and take deliberate actions to support the usage and thereby reach the critical mass needed.

As a starting point it is absolutely crucial for management to support the implementation of web 2.0, not letting it happen by chance. According to Corso et al. (2008a) as well as Chui et al (2010), a barrier is found in that the potential value and economic benefits of using Web 2.0 are not well understood by management in general. This results in that many grass roots initiatives, as significant for Web 2.0 implementation (Chui et al. 2009), will not get the needed support from the top which results in low adoption and thereby unrealized value. This is clearly supported within companies as E and J, where the existence of engaged people

around existing tools or initiatives is not enough to take the efforts to the next level without support from management.

The opposite situation can be exemplified by Company M, today benefiting from a widespread use of Web 2.0 tools. Within the company people involved in grassroots usage certainly had to prove the value of the tool, but when doing so also received extensive support from the top which has been crucial for what has been accomplished to date. Also at Company K, where Web 2.0 platforms are used with substantial result, great top down support is seen by central ownership via the learning function within human resources even though activity on the ground are considered crucial as well. A final example of the role management can play for Web 2.0 implementation efforts is found in Company N, an organization reporting great effects. Here the implementation can be said to be initiated from the top with visionary leaders that started to blog about the need of making use of the new array of Web 2.0 tools that were emerging. Throughout their period of usage lower level employees have been supported by top management where functions as CIO office, marketing and communication have been responsive when needed. Ultimately these examples show a very strong link between achieved adoption, received results and top management support and participation, regardless of top down or bottom up implementation. This fact is also supported by McKinsey research stating that adoption needs help from top management (Chui et al. 2009).

Besides a need for top management support, the Innovation Director at Company M highlights the need for experimentation. This also gets support from McKinsey research stating that one shall allow experimentation before scaling up instead of having top management predefine an intended usage which is fully implemented without prior evaluation and testing (Chui et al. 2009). Furthermore it is preferable that the business rather than IT-department are leading the selection of tools. As Cook (2008) states, much too often organizations go for vendor-led choices on what already is in use within the organization. This is supported by the Scientific Advisor and Technology Intelligence VP at Company L stating that IT-departments are too focused on sticking to existing platforms without allowing complementary tools to be used. Additionally the Researcher at University P states that new technologies preferably can be used together with existing platforms, theoretically supported by Cook (2008). An interesting observation, related to this, is how almost all companies are moving towards increased SharePoint usage utilizing the built in Web 2.0 applications that the overlying platform offers. Simultaneously companies as A and D as well as the Researcher at University P experience that some of these applications as for example the wiki and blog are lagging behind in user friendliness. This raises the question of to which extent one only shall use built in applications in SharePoint, especially with the great success shown in Company K by using stand alone tools.

However, as stated by Corso et al. (2008a) too many companies are focusing on technology instead of addressing organizational and change management aspects. This statement is supported by several interviewees, for example the Senior Business Strategy Manager at Company E stating the tools are never the limiting factor for adoption. What is an important element in supporting adoption though is education and training (Hinchliffe 2007). As McAfee (2009) points out these tools are different in how they are supposed to be used compared with more traditional document centric way of working. Empirical examples of this are found in Company A, where the Research and Development Manager highlights how it is challenging to use the wiki coming from the traditional way of working. Company K is responding to this by providing very well received online education material for their highly

used wiki. Other examples of training are found in the guidelines for Web 2.0 usage within Company N and education by human resources in Company L. Besides education of how to use the tools, Paroutis & Al Saleh (2009) points out the need for communicating the value of using the tools. The Chief Technologist at Company N as well as the Research and Development Manager at Company A support this by stating it important in order to make people motivated to take part and contribute.

In order to have people make use of the new tools it may not be enough to tell them the value one can receive though. Time pressure and a feeling of these tools as just another burden need to be addressed as stated by the Research and Development Manager at Company A. Accordingly McAfee (2009) states that people as beings are not keen on change. According to McKinsey research a key to increase usage is to make these new tools part of daily activities. A similar view is expressed by the Concept Manager at Company J suggesting them when implementing new platforms to enforce regular habits to make use of the tools. Within Company N this was done by using key performance indicators to have people contribute during their implementation of a today widely used platform.

Another important factor in reaching the critical mass needed to gain results is to localize the right base of users, consisting of experienced people that add value (Chui et al. 2009). This statement is supported by both the Concept Manager at Company J and the Innovation Director at Company M. Accordingly the Scientific Advisor and Technology Intelligence VP finds it especially important to find the right nodes in networks having valuable connections and thereby the ability to affect others.

To have people take part one accordingly must feel trust and not be afraid of using the tools (Chui et al. 2009; Paroutis & Al Saleh 2009). This is empirically supported by the Scientific Advisor and Technology Intelligence VP at Company L who states mutual respect and feeling trust using the tools as being a top priority for an open valuable communication. An important aspect regarding idea management is that one accordingly must feel comfort and willingness in sharing ideas, not feeling fear of others taking credit for them as highlighted by the Innovation Director at Company M. With focus still on idea management additional factors are important. Most crucial according to the Researcher at University P, as well as many others, is to avoid the idea management system to be a black box. There is an empirical consensus in the need for feedback and that one as submitter must feel visible in order to continue contributing. This is in line with an overlying motivational and engaging factor for Web 2.0 usage in the need of recognition and reputation (Paroutis & Al Saleh 2009). Not the least important is that management is participating in this process of interaction (MacAfee 2009). Within the idea management systems this becomes especially clear, and can be exemplified by Paroutis & Al Saleh (2009) mentioning that one must get credit for sharing ideas. To ensure this to happen, idea management systems benefit from ownership of an assigned team taking responsibility for the interaction. Another factor highlighted is the need to explicitly state what ideas one is searching for which results in higher quality submissions as stated by many of the interviewees. Finally, when regarding idea jam events, the Collaboration and Innovation SME at Company N highlights the possibility to invite a company profile in the jam events to raise participation, as one way of marketing the events.

Considering specific tools, the Knowledge Management Manager at Company K mentions a key success factor being to have content moderators. This means someone looking after each community or a subject area of the wiki. Regarding the communities of practice another important aspect is to have a process to close down unsuccessful forums and to support the

valuable ones. The Knowledge Management Manager states accordingly that a key factor regarding blogs is to have them aggregated, easy to find and easily searchable to gain interest.

5.4 Collaborative Platforms as a Response to Previous Issues

Innovation has in previous chapters been described to be based upon ideas that developed and combined ultimately are realized into new products, services or processes put in practice. Accordingly ideas have been stated crucial as being the prerequisite for any innovation processes to take off. As stated by Tapscott (2006) knowledge is a top priority for innovation. Howells (2002) states though that innovation is not only based on existing knowledge but is being boosted by people acquiring new knowledge making interaction, sharing and collaboration crucial. As Flemming (2007) states, collaborative ideation enables breakthrough innovation at a higher pace than for lone inventors. It is in this perspective these new Web 2.0 platforms shall be seen as they open up for new possibilities in linking geographically spread or internally disconnected employees together. The tools also make it possible to connect over company boundaries in efforts of what Chesbrough (2003) defines as open innovation. Ultimately the tools enable possibilities of radically increased knowledge sharing amongst all these people.

Empirical evidences of the potential these tools possess are found in a wiki incorporating 80 000 employees, global interaction widely utilized within communities of practice and companies being aggregated through shared workspaces in overlying enterprise content management systems or groupware. The 4Cs categorization approach developed by Cook (2008) shows what different roles the wide array of Web 2.0 takes on. Altogether these tools are able to address shortcomings in previous attempts to manage knowledge in a way that ultimately increases innovation. Earlier generations of knowledge management systems are by McAfee (2009) stated to either be of channel type (e-mails) or of platform type (portals, intranets). Where channels are considered limited by only few people taking part of the information flow, the previous platforms may be visible for many but being too centralized and leaving no traces of their visitors. Regarding the new Web 2.0 tools emerging they are in contrast to former channels giving larger crowds access to information flows. In contrast to previous platforms the new Enterprise 2.0 ones are also much more lightweight including possibilities, by tags and links, to shape an environment where it is easy to find people.

By the use of Web 2.0 tools one is also better prepared to facilitate exchange of tacit knowledge, as being seen crucial for ideation. This context dependent knowledge, as being rooted in action and sense-making, has been hard to capture and share through earlier knowledge management efforts (Swan et al. 1999). Attempts to codify tacit knowledge (including a personal quality) stored in a database, may only result in knowledge being useless or inaccurately interpreted. What is needed in the exchange of tacit knowledge, making it explicit, is an interactive negotiation and sense-making that either can take place through face-to-face communication or through a virtual interactive meeting place. What makes Web 2.0 platforms interesting in this context is that these platforms, by including social networking capabilities as illustrated within figure 7, make people find each other easier and by that they are able to meet and exchange tacit knowledge through face-to-face communication. Additionally the Web 2.0 platforms provide tools as for example discussion forums which by enabling interactive virtual communication allow exchange of the tacit knowledge.

Furthermore Web 2.0 tools address previous problems of knowledge being stored and exploited rather than knowledge being shared for exploration. Empirical findings of the

widespread use of discussion forums within communities of practice as well as wikis are examples of how knowledge being shared among experts in order to create new knowledge as by Swan et al. (1999) is seen crucial for new ideas to emerge.

Finally, one shall mention that Web 2.0 tools also are likely to strengthen creativity among people making use of them. The way in which Web 2.0 tools are enabling social networking and connections with others leads to that users are getting exposed of an increased number of influences. As Web 2.0 platforms are especially valuable for remote connections, an equal number of weak ties are emerging as shown in figure 7. According to Perry-Smith (2003) a great number of weak ties, in contrast to strong ones, give impulses without anyone of them being too dominant, as explained to be the core in creativity.

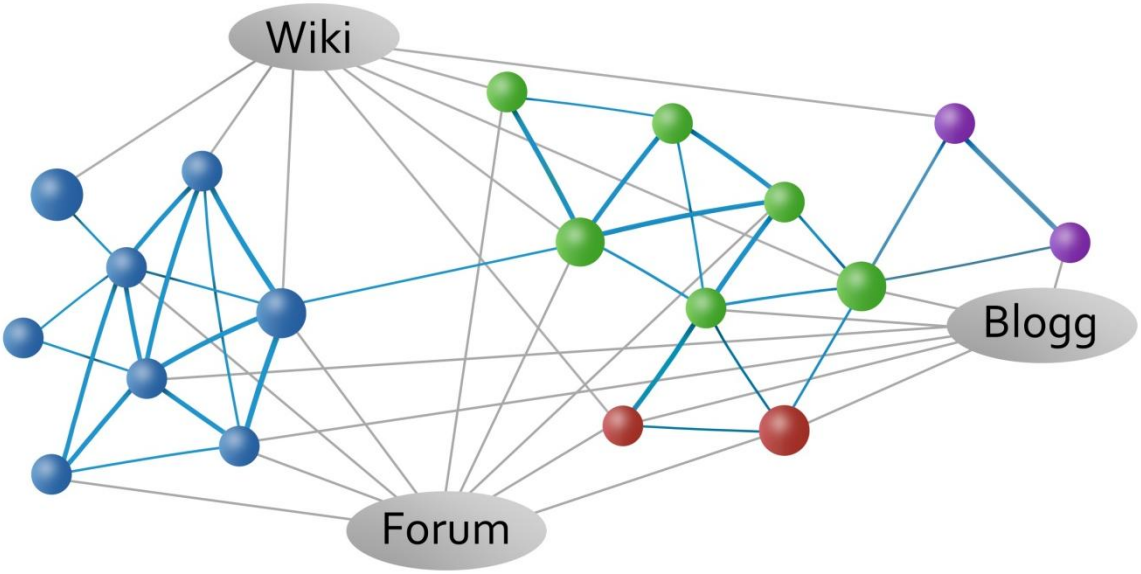


Figure 7: This figure aims to illustrate the increased number of links that the new Web 2.0 platforms enable. These links or connections and the shared workspaces that are put in place are facilitating tacit knowledge sharing as well as exploration not otherwise possible. This partly due to that structural holes, preventing information to flow and people to connect, are spanned which gets the community together. The figure also shows the number of remote influences, as considered the most valuable for creativity (Madjar 2005).

To conclude this chapter one can state that Web 2.0 platforms give possibilities to solve most problems experienced within previous efforts in managing knowledge. The absolute necessity of knowledge as enabler for ideation also makes Web 2.0 tools a possible main driver of feeding the innovation process with ideas, especially true as creativity are likely to rise through an increased number of weak links. Great effects are reported from heavy users of Web 2.0 regarding the increased ease with which one can find people and get access to knowledge. This can ultimately be seen as empirical indicators of what has been stated possible by using these tools in this analysis, already is happening within best practice companies.

6. Conclusions

Within this closing chapter the main conclusions made will be presented. Accordingly, managerial recommendations for SCA as well as possible future research will be covered in the subchapters 6.1 and 6.2. Recalling the original purpose of this thesis, the aim was to provide SCA with a base for their further actions within the area of collaborative tools. In order to form this base a mapping of the current status of Web 2.0 platforms in use within organizations and the intentions behind the implementation was called for. Additionally questions of what effects that can be seen as well as what managerial action that must be taken regarding implementation in order to reach successful results was needed to be answered. Upon the findings SCA will be able to build its future strategy of how to make use of collaborative tools to support idea and knowledge management.

This thesis clearly shows that several different Web 2.0 platforms are making their way into firms. From a strategic perspective the tools are at some companies responding to overlying aims as increased growth, sales and profitability. Others are looking at these tools on a lower level, mentioning an aim to boost innovation, to raise effectiveness and to enhance communication and collaboration as well as enabling people to build networks and share knowledge. Commonly used tools are found in discussion forums, supporting communities of practice as well as enabling discussions aimed for feedback and development of ideas within idea management systems and idea jams. Blogs aiming to support communication within companies are used by many and wikis aiming at building knowledge banks in a collaborative manner are used by a few. Several other tools as micro-blogs and, for the companies that have come far in their implementation, tagging and social search are in use. A key finding is how most companies are making use of the Web 2.0 tools as applications within platforms such as SharePoint or Lotus Connections. Regarding these overlying platforms they are globally implemented, in many cases aiming at aggregating globally dispersed units within the organization. Looking at the Gartner Hype Cycle one can conclude that the tools found to be most widespread in use within this research also have passed the stage of hype delivering substantial business value.

Experienced effects of Web 2.0 usage are found in search performance both regarding people and content. This leads to global connectivity and an increased ease in the set up of cross collaborative teams including a broad knowledge base. Effectiveness is improved by a reduction of e-mails and possibilities of reusing material to a higher extent. Regarding ideation, idea management systems are reported to enable great improvements regarding feedback to idea submitters which ultimately results in an increase in motivation and organizational visibility of key contributors. User feedback also enables evaluation committees to get additional viewpoints as well as the burden for the committees to respond to all submitted ideas is reduced. With focus still on ideation, idea jam events have clear effects not only in increasing the number of ideas submitted but also in driving important cultural change and how geographically spread networks are formed.

While great benefits are reported, both from this study and secondary data, McKinsey research shows that as few as 21 percent of Web 2.0 users are receiving more than very limited results. This highlights the question of what to do in order to reach the benefits of best practice companies. The answer lies in the implementation and more specifically in how to reach a high usage rate, as adoption stands in direct relation to having the intended results realized. Regarding the implementation of Web 2.0 platforms different patterns can be seen in this study. Some companies are experimenting at grassroots level simultaneously as others

have fully implemented mature systems in use based on an implementation that has been strategically supported from top management. While grassroots involvement is considered to be characterizing Web 2.0 implementations, one can conclude that top down support is a key for success. Without top management supporting the implementation, adoption will not pick up and the critical mass will not be achieved.

In addition to top management support, several other factors are found to be crucial in order to be successful. First of all it is found important to allow experimentation and that the business units rather than the IT-departments decide what tools to use. Furthermore it is crucial to educate the employees in the organization and articulate the individual value that can be gained from usage of the tools. Based on the time pressure of today's knowledge workers, it is also of high importance to integrate these tools in the daily operations. Further key aspects are to involve the right persons in the usage of these tools and to shape an environment where employees are feeling the comfort to participate.

Regarding idea management systems there is a crucial need to avoid that the systems are being looked upon as a black box. To make the employees motivated and stimulated to use the Web 2.0 applications to discuss, comment and rate ideas, it is very important to have the idea submitters feel appreciated and visible. Additionally there is a need to form an ownership team of Web 2.0 tools including needs to have moderators and content owners appointed overseeing content in for example wikis, discussion forums and idea management systems. If the factors highlighted above are addressed in an appropriate manner and a suitable mix of tools are implemented, one as a company is likely to receive the benefits already reported by the best practice companies of today.

6.1 Recommendations

The several implications for management that this thesis presents, highlights the core that SCA must consider. If one wants to achieve the successful results reported from some case companies it is crucial to form a strategy and address the stated success factors regarding implementation. If not, the risk is that adoption will not pick up and SCA will be struggling as some other companies are doing in this area due to low usage. What is positive for SCA is that it is a fairly large company which makes the tools work with less percentage usage than for smaller companies. This indicates great possibilities and by not only focusing on the specific tools, but by adopting a process around them, great effects can be reached as stated in this as well as in previous chapters. At SCA one shall also be aware that these tools not only support ideation and knowledge creation and sharing but other aspects as an overlying effectiveness in the work process as well.

An implication for SCA is that low risks are taken by implementing these Web 2.0 tools from a maturity point of view. This is based on that the most commonly used tools as exemplified in these conclusions all have passed the peak of inflated expectations within the Gartner Hype Cycle curve, where tools such as discussion forums and blogs are especially mature as Web 2.0 tools. What specific tools to make use of must be considered upon a broadened strategic analysis of what needs SCA does have regarding knowledge sharing and ideation. A starting point can be to use the 4Cs approach used in this report to see if it is within communication, collaboration, cooperation or within connection one has the most urgent needs. What has to be highlighted though is that one type of tool does not exclude the others. Remembering the SLATES framework, it is clear that the search function is a result of for example working with links, authoring and tags. This is not surprisingly verified by the companies that have the most widespread use, that the platforms support each other. Still one should be aware of that

this does not mean that one cannot start on a lower level with a few platforms and over time complement the original efforts. This is especially true as time for an initial experimentation to find out what is working for one's own organization is a key factor for success.

To conclude, SCA can make great benefits by the use of these tools if the needed willingness from top management is there for the crucial support. If so, the results reported from best practice companies can be achieved over time at SCA as well. Not the least this is true if one put this in a larger context, not only focusing on knowledge and ideas but integrate these efforts in the larger extensive innovation process and make this clear by communicating the relation. The fairly low risk in implementing these tools in combination with the possible gains some companies already are benefitting from finally highlights that it is time for SCA to further investigate how to make use of Web 2.0 platforms within their innovation efforts.

6.2 Future Research

Based upon the performed compilation of literature, the conducted interviews and the work of analyzing gathered material aiming to answer stated research questions for this thesis, some observations have been made that calls for future research. First of all, a key factor in reaching critical mass within the use of Web 2.0 is to focus on those individuals acting as nodes in different network constellations. These individuals usually possess an impressive amount of knowledge and sometimes have a powerful situation acting as brokers over structural holes. Future research could be how to ensure these people to take part in Web 2.0 efforts that may reduce their own power.

While this thesis has been limited to include the earliest phases of the innovation process, there is still a need to investigate how Web 2.0 platforms can support the process of realizing ideas and taking them further into implementation in the market. In some of the case companies great processes of how to get people involved in taking the ideas further has been described.

While the concept of open innovation has been touched upon in this thesis, a more thorough investigation of how this phenomenon can be supported by Web 2.0 platforms is called for. This is especially interesting as the fit between open innovation and the connections over geographical boundaries that Web 2.0 technologies are enhancing is striking.

Some interviewees have mentioned ongoing pilot projects and initiatives in using different Web 2.0 applications connected to mobile devices. These devices like Smartphones are in increasing numbers becoming available, either provided within the workplace or being available as consumer devices. Further research is needed to understand the opportunities and value in using Web 2.0 technologies within mobile devices and how that can address the need for individual mobility.

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Appendix - Interview Guide

The interviews have been based upon a semi structured approach where rather structured and open questions have served as the foundation of the interviews. Important to mention though is that each interview has been heavily customized as a response to each individual interviewee and the company he or she has presented. The differences in how companies uses these tools makes that the questions presented below have been useful as a guideline for the qualitative, exploratory study that has been conducted rather than that they strictly have formed the interviews.

General Questions

1. Which web based interactive collaborative tools are in use within your organization and which ones of these are the most important?

2. How and to what degree have these tools been integrated in existing knowledge and/or idea management systems and how do you make use of these larger systems?

3. Have you defined a strategic intent regarding these tools and if so which?

4. Which are the reasons behind your introduction of this type of tools – do you rate your implementation to be early or late compared with other companies?

5. How broad is the implementation of these tools within your organization and between you and other parties?

6. How many are using the tools and have you been able to define how many users are needed to be able to achieve intended results?

7. How has the interest been for the tools and how have they been accepted by those who are to use them?

8. How have you carried out your implementation, has it been driven from top down or has it grown from below in your organization?

9. What efforts have Management and Human Resources made to support collaboration and raise the usage rate of this type of tools?

10. What learnings have been made from the implementation?

11. Which effects have you experienced from the implementation of these tools and how do you measure results, have you defined KPI's in place?

12. What is your view regarding openness and information security regarding these tools?

13. Do you have plans to move ahead with the usage of this type of tools in the future, if so - how?

Tool Specific Questions

14. What are the pros and cons with this tool?

15. Have you defined a specific strategic intent for this tool and if so - which?

16. How far have you come with the implementation of this tool, how is it spread and when did you start?

17. How has the interest been for this tool and how has the acceptance been?

18. Which effects have you experienced at the implementation of this tool and is it meeting its intent?