Chapter 2
Exploring the Impact of Web 2.0 on Knowledge Management

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ABSTRACT

Web 2.0 and Knowledge Management (KM) have a considerable overlap. It appears promising to apply Web 2.0 applications for supporting and improving sharing and creation of knowledge. Yet, little research examining the impact of Web 2.0 on KM has been conducted. This chapter presents research examining the suitability and impact of Web 2.0 applications on KM in organizations. Two extensive exploratory case studies were conducted involving 11 interviews with key personnel of two student-run organizations. It is demonstrated how Web 2.0 applications can be used for a number of KM practices mostly related to the areas of asset management and knowledge creation and innovation. Moreover, they suggest that among all the Web 2.0 principles, User-Generated Content and Unbounded Collaboration exert the biggest influence on creating and sharing of knowledge within organizations. The study contributes to the general understanding of how Web 2.0 and KM practices can be interlinked with each other.

INTRODUCTION

Today, an increasing amount of organizations recognize the importance of their workforces' knowledge as assets leveraging competitive advantage (Drucker, 1999). This development gave rise to the emergence of Knowledge Management (KM). The KM discipline describes how knowledge-intensive organizations can develop a strategy and design an approach to manage the creation, sharing and application of knowledge in order to perform better and reach their overall strategic goals (Dalkir, 2005).

After the dot-com crash in 2001, a new trend emerged on the Web that is often referred to as "Web 2.0" (O'Reilly, 2007). Although the name suggests a new release in a technical sense it is rather a new approach of how users and devel-

opers face the Web. The key idea of Web 2.0 is putting the user at the center. It enables people to participate, collaborate and interact with each other. Web 2.0 has become a mass phenomenon. The social-networking site Facebook counts more than 400 million active users (Facebook, 2010), exceeding the population of USA, and the collaborative encyclopedia Wikipedia contains more than 15 million articles (Wikipedia, 2010) created by a collective of internet users.

As Web 2.0 applications have brought about significant change to how we use the Internet nowadays, companies have begun adopting Web 2.0 applications such as wikis and social networking for leveraging and improving their core processes often referred to as "Enterprise 2.0" (Chui, Miller, & Roberts, 2009). McAfee states "Enterprise 2.0 tools have the potential to usher in a new era" (McAfee, 2006). As more than half of the 2,800 executives surveyed 2007 by McKinsey indicate that they are satisfied with their companies' return on investment in Web 2.0 technologies, adopting Web 2.0 applications also seems to be interesting from an economic point of view.

One of KM's key aspects is also concerned with fostering interaction and collaboration, commonly referred to as "Socialization" (Nonaka, 1994). According to Levy (2009) KM and Web 2.0 are considerably close to each other. Therefore, it seems interesting to apply Web 2.0 principles to KM. Could this potentially lead to a new era of KM, a "Knowledge Management 2.0" that changes our understanding of it in a similar way as Web 2.0 changed our understanding of the Web?

A literature research revealed a number of publications describing the implications of Web 2.0 on KM (cf. Hustad & Teigland, 2008; Levy, 2009). However, none of them has systematically studied the impact of Web 2.0 applications on KM. This is where this research joins in. By conducting two extensive exploratory case studies in organizations that use Web 2.0 applications for KM, we would like to shed light on the following research question:

How can organizations use Web 2.0 applications for managing knowledge and which impact can they have on organizational KM?

The research contributes to the general understanding of how Web 2.0 applications can be used to support or enable KM. The results are captured in a framework of Web 2.0 applications, the KM 2.0 Spectrum, and an impact model, the KM 2.0 Impact Model. The KM 2.0 Spectrum can be used as an orientation by organizations that are interested in bolstering up their KM practices by adopting Web 2.0 applications. It provides an overview of the KM aspects that may benefit from Web 2.0 applications. They are provided with suggestions and insights into which Web 2.0 applications can be used for KM. From a scientific point of view, the research contributes to the general understanding of Web 2.0 by proposing a model that relates different aspects of Web 2.0 with each.

BACKGROUND

This section introduces the main concepts related to the research question: KM and Web 2.0. Furthermore, related literature on Web 2.0 in the context of KM is summarized and discussed. Finally, we introduce some literature concerning the impact of technology on organizations that we use as a basis for the impact model that will be introduced later on.

KNOWLEDGE MANAGEMENT

In today's economy increasingly more companies base their competitive advantage on what they know, how efficiently they use what they know and how quickly new knowledge can be acquired and used (Davenport & Prusak, 1998). These developments have led to emergence of the KM discipline that can be defined as follows:

Knowledge management is the effective learning process associated with exploring, exploitation and sharing of human knowledge that use the appropriate technology and cultural environments to enhance an organization's intellectual capital and performance. (Jashapara 2004)

Although its name may suggest something else, KM is not so much about managing knowledge but rather about managing knowledge-related processes. Knowledge management is more than information or document management. Additionally, it is not only focused on technology but also involved with cultural aspects.

A general goal of KM is "to leverage knowledge to the organization's advantage" (Nichols, 2000 cited by Dalkir, 2005, p. 4). KM programs aim at retaining knowledge in organizations when people retire (DeLong, 2004) and manage those processes effectively that help the organization to create and share knowledge.

Scholars distinguish between two types of knowledge: explicit and tacit knowledge (Nonaka, 1994; Polanyi, 1966). Explicit knowledge can be expressed in numbers and words. It can be easily formalized and shared within an organiza-

tion. Tacit knowledge, in contrast, encompasses experiences, insights, and intuition. It is difficult to formalize and share this kind of knowledge.

Knowledge Management Processes and Practices

There are numerous models that describe the major steps in the capturing, creation, codification, sharing, accessing, application and reuse of knowledge within and between organizations (Dalkir, 2005, p. 25). Based on the KM cycles of Bukowitz and Williams (1999), McElroy (1999), Meyer and Zack (1996) and Wiig (1993) and her experience in the KM field Dalkir (2005) proposes an integrated KM cycle that is shown in Figure 1.

After knowledge has been captured from internal or external knowledge sources (previously unknown knowledge or know-how) and/or has been created, it has to be assessed according to the relevancy for the organization. Subsequently, knowledge is shared within the organization. Before it can be used by people it has to be contextualized in order to correspond to their needs. As people make use of the knowledge, the KM cycle will be restarted and people may contribute

Figure 1. An integrated KM cycle (Dalkir, 2004, p. 43)
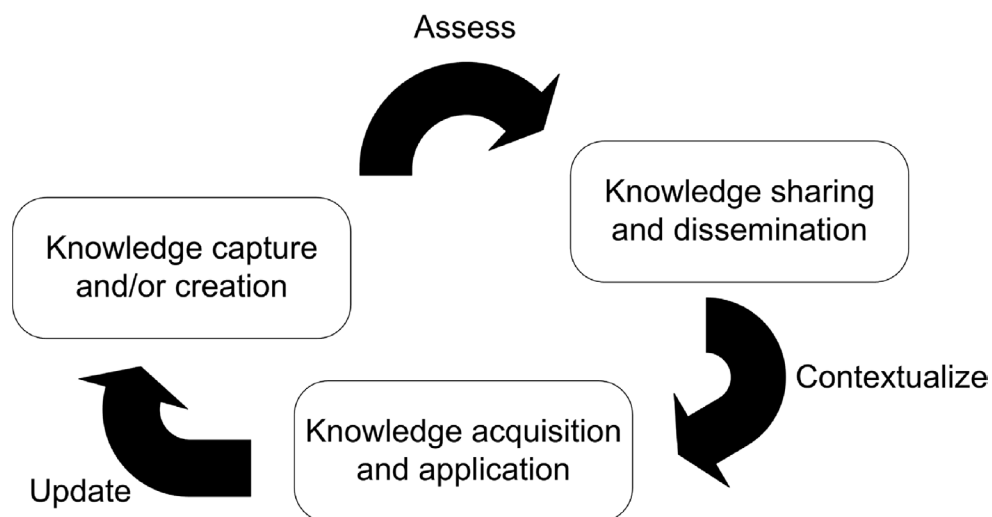
new insights and signal if the knowledge is not applicable anymore and needs to be updated.

There are a number of KM practices related to the major KM processes. Binney (2001) came up with a framework that brings together various KM theories, tools and techniques discussed in literature. Binney refers to his framework as the KM Spectrum and it is depicted in Figure 2.

Many of the KM practices that Binney refers to are rather technical. One might even argue that some of them, especially the ones on the left hand side of the spectrum, are more data analysis or information management applications. One of Binney's own observations is that there is a tendency in the spectrum that reaches from a technologist viewpoint to a organizational theorist viewpoint. This goes along with a focus on explicit knowledge on the left hand side and more tacit knowledge on the right hand side.

As pointed out in the definition of KM that we referred to earlier, KM is about both technology and culture. It is important to that technology should merely be a mean and not a goal in itself. In the context of KM, technology should support different KM practices in order to help an organization achieve its ultimate goal.

As Binney's KM spectrum provides an extensive overview of possible KM practices, we will use it as a starting point for examining the KM functions of the case organizations and then determine in which way Web 2.0 applications can be used for facilitating these practices.

Web 2.0

A glance at Google's search history shows an increasing interest for the term "Web 2.0" since its emergence in the early 2000s. This shows the term's popularity but what does it actually stand for? Musser and O'Reilly introduce it as "a set of economic, social, and technology trends that collectively form the basis for the next generation of the Internet" (Musser & O'Reilly, 2006). However, some scholars argue that Web 2.0 is merely a meaningless marketing buzzword (Brodkin, 2007). It seems necessary to further illuminate it and its context in order to come up with a clearer definition of the concept.

In 2004, the term gained popularity when O'Reilly Media and MediaLive initiated the first Web 2.0 conference (O'Reilly, 2007). O'Reilly and others (Hoegg, Meckel, Stanoevska-Slabeva, & Martignoni, 2006; McAfee, 2006; Vossen & Hagemann, 2007) came up with a number of general principles describing the properties of Web 2.0. Knol, Spruit and Scheper (2008)

Figure 2. Spectrum of KM applications (Binney, 2001)

	Transactional	Analytical	Asset Management	Process	Developmental	Innovation and Creation
KM Practices	▪ Case Based Reasoning ▪ Help Desk Applications ▪ Customer Service Applications ▪ Order Entry Applications ▪ Service Agent Support Applications	▪ Data Warehousing ▪ Data Mining ▪ Business Intelligence ▪ Management Information Systems ▪ Decision Support Systems ▪ Customer Relationship Management ▪ Competitive Intelligence	▪ Intellectual Property ▪ Document Management ▪ Knowledge Valuation ▪ Knowledge Repositories	▪ Total Quality Management ▪ Benchmarking ▪ Best practices ▪ Quality Management ▪ Business Process (Re-) Engineering ▪ Process Improvement ▪ Process Automation ▪ Lessons Learned ▪ Methodology ▪ SEIICMM, ISO9XXX, Six Sigma	▪ Skills Development ▪ Staff Competencies ▪ Learning ▪ Teaching ▪ Training	▪ Communities ▪ Collaboration ▪ Discussion Forums ▪ Networking ▪ Virtual Teams ▪ Research and Development ▪ Multi-disciplined Teams

compared the principles proposed by different authors and proposed a generic set of Web 2.0 principles (they refer to them as Social Computing Principles). They further point out that those generic principles are either technology-oriented or socially-oriented. The four technology-oriented principles are *intuitive usability, enabling services, lightweight models* and *open platform.* The five socially-oriented principles are *user-generated content, network effects, collective intelligence, unbounded collaboration* and *leverage the long tail.*

The phenomenon of Web 2.0, i.e. what you can see about it, can be mainly related to the socially-oriented principles that are enabled by a set of Web 2.0 Technologies. Therefore, we propose the following definitions based on the Web 2.0 principles:

Web 2.0 is the reorientation of the Web that promotes unbounded interaction, collaboration and participation of people. It is characterized by the emergence of a large amount of content generated by a collective of Internet users. It harnesses networking effects and leverages the long tail.

Web 2.0 Technologies are technologies that transform the Web into a platform spanning all connected devices. They enable the creation of web-services and applications, constructed from lightweight models, and can be used intuitively.

Web 2.0 Applications

The Internet is a very dynamic place where nearly every day new services and applications appear and others disappear. As things change so quickly, we will refer to generic types of services and applications rather than specific ones in the following. A general difficulty that we encountered while reviewing literature like Chui et al. (2009) and Andersen (2007) is finding a good scope of looking at these services and applications. Chui et al. list a number of "Web 2.0 technologies" which encompass both web-services (e.g. social networking, wikis) but also function sub-aspects of them (e.g. commenting, tagging, polling etc.). Andersen speaks about "Web 2.0 services and applications" and describes it main characteristics. For the sake of simplicity, we will refer to these applications, services and technologies solely as "Web 2.0 applications" in the following.

Table 1 lists a number of Web 2.0 applications that we derived from Andersen (2007) and Chui et al. (2009) and some examples of these applications.

Towards the Web 2.0 Layer Model

In order to determine the importance of the socially-oriented Web 2.0 principles for each type of Web 2.0 application, we associated them with each other. The result of this matching is shown in Table 2.

In Figure 3 the Web 2.0 Layer Model is shown. This model combines the three principal aspects of Web 2.0 with each other by depicting them in different layers.

The technology-oriented Web 2.0 principles represent the fundament of Web 2.0 and therefore are depicted in the bottom. Based on these principles a number of Web 2.0 applications, as depicted in the middle layer of the model, have emerged. The socially-oriented Web 2.0 principles are related to social behavior that is enabled by Web 2.0 applications. Different colors are used to make clear which socially-oriented Web 2.0 principles describe the characteristics of each Web 2.0 application.

Towards an Impact Model of Knowledge Management 2.0

This section explains how we determined the impact of Web 2.0 applications on KM practices in case studies in two student-run organizations. In addition, it introduces the KM 2.0 Spectrum, an overview of Web 2.0 applications for KM, and the KM 2.0 Impact Model that is based on the findings from the two case studies.

Table 1. List of generic Web 2.0 applications

Chui et al.	Andersen	Generic Web 2.0 application	Examples
Wikis	Wikis	Wiki	www.wikimedia.org www.twiki.org
Shared workspaces	Collaborating Replicate office-style software	Shared workspace	www.google.com/docs
Blogs	Blogs	Blogging	www.blogspot.com www.wordpress.com
Tagging social bookmarking	Tagging and social bookmarking	Social bookmarking	www.digg.com del.icio.us
Social networking	Social Networking	Social networking	www.facebook.com www.orkut.com www.myspace.com www.twitter.com
Podcasts Videocasts	Multimedia sharing Audio blogging and podcasting	Media sharing	www.youtube.com www.picassa.com www.flickr.com

Assessing the Impact of Technology on Organizations

By applying Giddens (1976, 1979, 1984) theory of structuration to the specific context of technology in organizations, Orlikowski (1992) presents a theoretical model that conceptualizes the interaction between technology and organizations. In contrast to previous works that tried to conceptualize this relation, she introduces two important notions; the duality of technology, i.e. technology is not only shaped by humans but also shapes humans' actions, and the interpretive flexibility of technology, i.e. the outcome of applying technology depends on the actors and the social-historical context it is applied to.

DeSanctis and Poole (1994) further developed Structuration Theory to provide a set of concepts to examine technology induced change, which they call Adaptive Structuration Theory (AST).

AST extends Structuration Theory for technological impact by considering the mutual influence of technology and social processes. They propose a model that summarizes the major constructs and propositions of AST and apply it to analyze the impact of group decision support systems on small group's decision making processes but "the concepts and relations posited [there] could be applied to other advanced technologies and other organizational contexts" (DeSanctis & Poole, 1994).

After exploring which Web 2.0 applications are used for KM (sub-research question 5) and formalizing the findings by mapping them to Binney's (2001) KM spectrum, we used some of DeSanctis and Poole's (1994) propositions and constructs to design our research, which is expressed by the questions of the case study protocols. These questions are used to derive some factors describing the potential impact of Web 2.0 applications on organizational KM practices.

Determining Impact Factors

AST proposes that the use of advanced information technologies has two types of impacts on organizations. First, it has an impact on process outcomes and second, it leads to the creation of new social structures, i.e. rules and resources, within in the organization.

In the case studies we determined how using Web 2.0 applications impacted process outcomes

Table 2. Web 2.0 applications and principles (reasons indicated if associated)

	1 – Unbounded Collaboration	*2 – Collective Intelligence*	*3 – User-Generated Content*	*4 – Network Effects*	*5 – Leverage the Long Tail*
Wiki	Time and location not important for contributions	Snippets from many contributors	Content from users	Many contributors necessary to produce high quality	
Social Bookmarking	Time and location of people is not important	Generates intelligence from users' contributions	Users share bookmarks	Many contributors necessary to benefit from automatic suggestions etc.	
Shared Workspace	Collaboration independent from time and space possible		Used for generating content by user		
Blogging	Linking and commenting on each other's posts independently from time and space		Enables every user to publish	People may only write a blog if others do as well and the blog is read by many	
Media Sharing	Time and location not important		Enables every user to publish	People may only share media content if others do as well and the content is viewed by many	
Social Networking	Interaction independent from time and space		User may contribute and share content	Many users necessary to make it work	Each post may add a micro value for people

Figure 3. Web 2.0 Layer Model
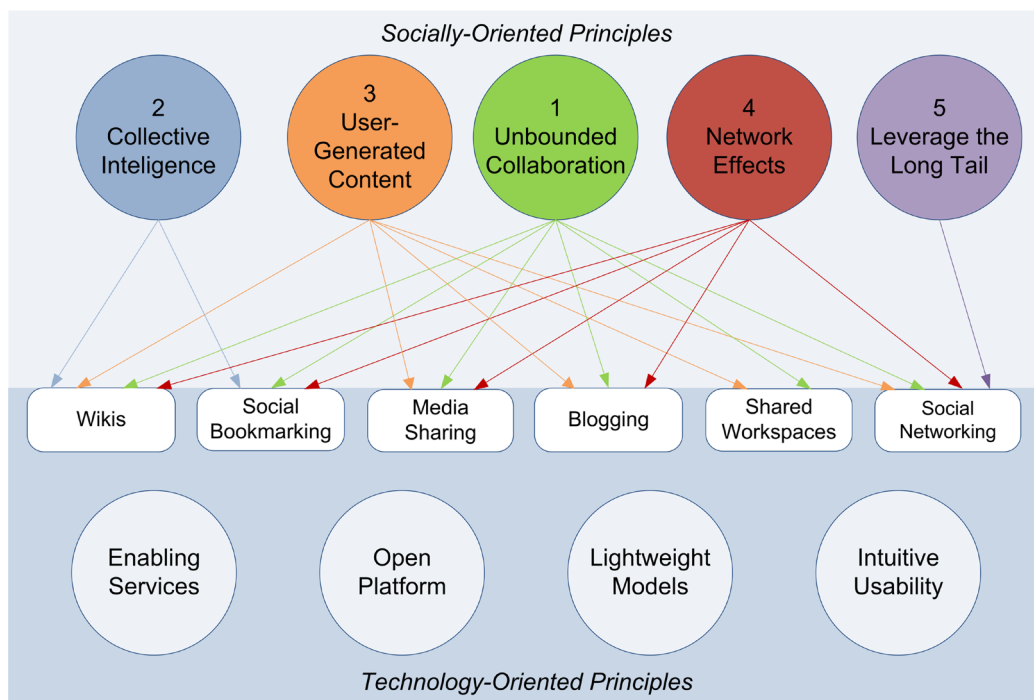
in the context of KM. The different aspects of KM are captured by Binney's (2001) KM spectrum that we used for analyzing each case organization's KM function. In addition, we identified new social structures that have emerged as a consequence of using Web 2.0 applications for a specific KM aspect.

Process Outcomes

According to DeSanctis and Poole (1994) it is difficult to make "clear-cut predictions about how advanced information technology structures will be appropriated, or what the ultimate outcomes of that appropriation will be". They assume that the expected outcomes are more likely to be found under ideal circumstances. Although it cannot be expect that ideal outcomes are found for adopting Web 2.0 application in KM, we think that interviews with key personnel can give a good indication of how these applications impact certain process outcomes.

As AST proposes to look at the process outcomes (1) efficiency, (2), quality and (3) commitment, we adopted these and investigated for each aspect of the KM spectrum that is facilitated by Web 2.0 applications whether there is an increase in efficiency, an improvement of quality and/or an increased commitment towards the KM aspect.

New Social Structures

DeSanctis and Poole (1994) define structuration as "the act of bringing the rules and resources from an advanced information technology or other structural source into action". In the context of this research structuration takes place when people use Web 2.0 applications for specific aspects of KM (as summarized in Binney's (2001) KM spectrum). It could be assumed, for instance, that the appropriation of Web 2.0 applications reduces the number of physical meetings and leads to new ways of coming together to share information and ideas.

For each KM aspect that is facilitated by Web 2.0 applications we determined if new social structures had emerged. For instance, this could be new types of behaviors (rules), or new resources that can be used for the respective aspect of KM. Table 3 sums up the potential impacts that we look at for each practice of KM that we identified in the case organizations.

CASE STUDIES

In order to answer the research question, case studies were conducted in two of Germany's largest student-run organizations: AIESEC and MARKET TEAM. The case studies involved a number of semi-structured interviews with key personnel, a study of internal documents and a review of the used information systems.

Case studies have be become a common research instrument used in social sciences (Yin, 2008) but also in information systems research (Benbasat, Goldstein, & Mead, 1987; Darke, Shanks, & Broadbent, 1998). As pointed out by Dul and Hak (2008, p. 4), case study research (CSR) generally involves only one single instance or sometimes a small number of instances. CSR is a research method that is applicable in situations where a number of variables are to be observed in a real life context and where this observation cannot simply be limited to an analysis of data

Table 3. List of potential impact factors of using Web 2.0 applications for different KM aspects

Impact	Description
Efficiency	In which way has efficiency of the respective KM practice increased?
Quality	In which way has the quality of the respective KM practice's outcome improved?
Commitment	In which way have people become more committed towards the KM practice?
New social structures	Which new social structures (rules and/or resources) have emerged?

points (Yin, 2008, p. 18). It can involve both qualitative and quantitative evidence and is especially applicable to real-life situations that are too complex for survey and experimental research (Yin, 2008, p. 19).

A recent study published by Pew Research Institute shows that the largest group of people (30%) using the Internet, in fact, consists of people born between 1977 and 1990 (Jones & Fox, 2009). In a 2009 article on Web 2.0's implications on KM, Levy (2009) proposes to use people in this age as pioneers of Web 2.0 in organizations to leverage KM practices since "the younger generation finds the changes natural and or probably even waiting for the Web 2.0 tools to be available in the enterprise." (Levy, 2009)

Obviously, the generation of today's students is the most active group of Internet users and thus most familiar with the new technologies of Web 2.0. We therefore think that student-run organizations are an interesting subject for researching the implications of Web 2.0 on KM practices.

Case 1: AIESEC Germany

AIESEC has over 45,000 members globally, whereof more than 2,500 are from 47 local chapters (LC) in Germany. The organization aims at developing tomorrow's socially responsible leaders by running an integrated leadership development program and coordinating internships at its partner companies around the world.

Although not explicitly formulated, AIESEC's general KM strategy is to codify critical knowledge

to make it accessible to members. The strategy corresponds to a codification strategy (Hansen, Nohria and Tierney 1999). This strategy is necessary due to the high personnel turnover of the organization (e.g. AIESEC changes its complete management team every year).

KM Practices

We use Binney's (2001) KM spectrum as a checklist in order to map which aspects of KM are used by AIESEC. The key practices of AIESEC's KM are shown in Figure 4.
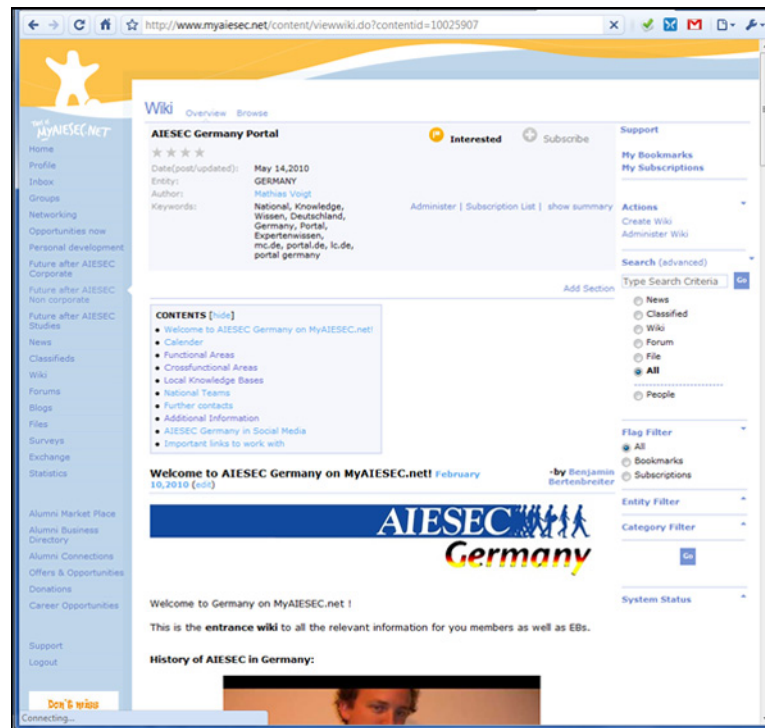
Web 2.0 Applications

In 2007, AIESEC decided to focus its strategy on fostering an organizational culture, where all members actively contribute to achieving the organization's goals. For KM this would mean that members on all levels actively contribute knowledge assets for instance by sharing knowledge. As the KM infrastructure, mainly based on Lotus Domino, was not designed to facilitate knowledge sharing bottom-up, the national executive board at that time formulated an explicit information management strategy that encompassed the migration from the Lotus Domino system to a global web platform: MyAIESEC. A screenshot of the web platform page is shown in Figure 5.

On the national level there are more than 400 wiki pages covering all functional areas. These wiki pages contain content that was formerly stored in the Lotus Domino based knowledge base

Figure 4. KM spectrum with AIESEC's key KM practices

	Transactional	Analytical	Asset Management	Process	Developmental	Innovation and Creation
KM Practices	▪ Help Desk Applications ▪ Customer service application	▪ Customer Realtionship Management (CRM) ▪ Business Intelligence	▪ Document Management ▪ Knowledge Reporsitories ▪ Content Management	▪ Best practises ▪ Quality Management ▪ Process Automation	▪ Skills Development ▪ Staff Competencies ▪ Learning ▪ Training	▪ Communities ▪ Collaboration ▪ Discussion Forums ▪ Networking ▪ Virtual Teams ▪ Multi-disciplined Teams

Figure 5. Web portal page of AIESEC Germany

(manuals, process documentation, forms and other documents).

Since then the organization has adopted a number of Web 2.0 applications to improve collaboration and knowledge sharing between its members. The upper part of Figure 6 provides an overview of different KM aspects in AIESEC Germany and the bottom part shows Web 2.0 applications used for supporting these aspects.

MyAIESEC, AIESEC's global web platform, contains a wiki module in which every user can create wiki pages. Information on MyAIESEC is searchable through an advanced search function based on tags and elaborated filters. Wikis are used for storing information such as manuals, contain process documentations and are used for collaborative idea generation (e.g. virtual brainstorming sessions). Even though wikis should enable everybody to contribute content or enrich other people's contributions, only a limited number of members have actually been doing so and

most of them are active nationally. Since there were some severe problems with the usability of the platform after its introduction, an interviewee suggested that the problem might be related to that.

AIESEC recently started using Google Apps, a bundle of collaborative web-applications. Its word processing module and its spreadsheets module are mainly used for documentation (e.g. minutes) and idea generation (e.g. brainstorming). The presentation module is used for virtual trainings and a module that allows form creation is used for creating surveys amongst members. In addition, for improving interaction and information exchange between the members a webmail application and a built-in instant messaging client that is identical with Google's consumer product Gmail is used. According to an interviewee the acceptance of Google Apps was significantly facilitated by its intuitive interface and the fact that users already knew the applications from personal use.

Figure 6. KM and Web 2.0 applications used for KM by AIESEC Germany

	Transactional	Analytical	Asset Management	Process	Developmental	Innovation and Creation
KM Practices	▪ Help Desk Applications ▪ Customer service application	▪ Customer Realtionship Management (CRM) ▪ Business Intelligence	▪ Document Management ▪ Knowledge Reporsitories ▪ Content Management	▪ Best practises ▪ Quality Management ▪ Process Automation	▪ Skills Development ▪ Staff Competencies ▪ Learning ▪ Training	▪ Communities ▪ Collaboration ▪ Discussion Forums ▪ Networking ▪ Virtual Teams ▪ Multi-disciplined Teams
Web 2.0 Applications		▪ Google Forms ▪ Google Analytics	▪ Web Portal (MyAIESEC) ▪ Youtube ▪ Flickr ▪ Wikis (MyAIESEC)	▪ Brandkore	▪ Google Presentation ▪ Slide Share ▪ WizIQ ▪ Teamviewer ▪ Netviewer ▪ Meetgreen	▪ Google Spreadsheets ▪ Google Docs ▪ Google Calendar ▪ Mindmeister ▪ Blogspot ▪ Twitter ▪ Wikis (MyAIESEC)

In order to streamline their marketing material creation, which needs to be customized for each chapter, AIESEC uses Brandkore, a web-based marketing automation tool. Consequently, members no longer need to be familiar with using complicated graphic suites.

To facilitate development and learning of its members AIESEC uses a number of e-learning applications such as the platform WizIQ and Teamviewer in combination with web-controlled telephone conferencing tools such as Meetgreen. The organization is currently evaluating the use of web-based video conferencing tools such as Netviewer that allow multiple users to see and interact with each other.

Although some communication channels such as Facebook and Twitter are mainly used for communication with external stakeholders, members have started using them for internal communications and collaboration amongst each other as well.

Impact of Web 2.0 Applications on KM

The following tables summarize the findings regarding the impact of Web 2.0 applications on these aspects of KM. The impact assessment is based on the AST model.

As we can see in Table 4 there is no clear answer to the question if wikis have increased efficiency of knowledge repositories and content management. However, Erik's negation is more attributable to the fact that people do not properly make use of the naming and tagging function that the system offers. Most respondents agree that there is an increase of knowledge quality triggered by the use of wikis. However, even with wiki systems the problem of redundancies remains. Instead of making use of links people tend to copy concepts and other knowledge assets to local versions of wikis where they become updated quite quickly (according to Peter S. and Erik S.). According to Michael it is also not clear if there is a commitment gain as people do not actively use the possibility of changing and contributing content even though they would be able to. Michael attributes this to the missing sharing culture. According to Richard people in one region (a geographical sub-unit of AIESEC) people used wikis to create a portal page that facilitates cooperation and knowledge exchange between different chapters. Before that there was no regional exchange platform in place.

As Table 5 suggest, social networking sites have increased efficiency of communication within AIESEC. The respondents also propose that social networking and blogging has increased transparency within the organization. However,

Table 4. Impact of wikis on AIESEC's knowledge repositories and content management

Interviewee	Web 2.0 Application	Efficiency gain	Quality Gain	Commitment gain	New structures
Richard	Wikis	People find knowledge more easily thanks to better search function	Knowledge is more up-to-date since more people (mostly on the national level) change it	-	Regional portal site created by region
Peter	Wikis	-	Yes, knowledge quality has increased over the past years	People more committed to share knowledge between local chapters	-
Michael	Wikis	-	Has not increased since the number people that contribute to wiki pages (that contain codified knowledge) has not significantly increased in comparison with the number of contributors to the previous Lotus Notes based knowledge base	Although it is possible to change pages, most members don't use this ← possible reason: mindset did not change	-
Erik	Wikis	No, because people don't use tags and title of wikis consistently finding information is more difficult	Yes, more codified knowledge is available However, still many redundancies as people copy instead of link content	-	-

they have also raised the problem that internal communication often takes place in public channels. In this way internal information could leak out of the organization. On the other hand, Peter notes that the current national executive board does not necessary see this as a deviation from the intended use since it might also shed a positive light on the organization if authentic internal communication in an open channel helps making the organization more transparent to people outside of it (e.g. people that are interested in joining it or partners).

The respondents listed in Table 6 agree with each other that shared workspaces have contributed to an efficiency gain in collaboration and coordination of virtual teams in AIESEC. Richard notes that the availability of Google Apps has led to the emergence of user-generated resources, such as tracking tools that can be shared between different people.

Since AIESEC has only recently started using Web 2.0 applications such as wikis and Google Presentation for virtual education, it was not yet possible to determine their impact.

Case 2: Market Team

Market Team (MT), solely operating in Germany, aims at providing students insights into the business world by organizing events like workshops, trainings and symposia with companies. The organization has around 1,000 members in 23 chapters (Market Team, 2010).

KM focuses on supporting day-to-day operations of the organization, which mainly consist of running various projects on both the local and the national level. Most KM practices are focused on codification of knowledge by creating handbooks for the organization's key functions and documenting experiences with projects. Although there is no formally expressed KM strategy the generic strategy corresponds to a codification strategy (Hansen et al. 1999).

Most KM initiatives take place on the local level. There is little knowledge sharing between different chapters. At the time of examination the organization ran an initiative for improving knowledge sharing between local chapters to build on synergy effect, i.e. re-use knowledge in different parts of the organization.

Table 5. Impact of Web 2.0 applications on communities within AIESEC

Interviewee	Web 2.0 application	Efficiency gain	Quality Gain	Commitment gain	New structures
Ken	Social networking sites, Blogs	Better communication	-	-	More transparency through communication between the national board and the local chapters Members have more information about events in other chapters People interact more with each other and ask for help from others more easily
Richard	Social networking sites, Blogs	More communication	-	-	More transparency through communication between the national board and the local chapters Internal communication in public channels
Peter	Social networking sites, media sharing services	-	-	-	Internal communication in public channels. However, this could be intended to increase external transparency.

People taking a role in a local or the national board generally have a term of one year. The fact that not all terms start at the same time ensures some retention of knowledge. On the national level this is formalized as the national board and the national advisory board have semi-overlapping terms, i.e. they start staggered by six months.

Knowledge Management Practices

Binney's (2001) KM spectrum is used as a checklist in order to map which KM practices are carried out by MT. The outcome of the analysis is shown in Figure 7.

Web 2.0 Applications

MT uses a web-based intranet portal that contains a number of modules that allow members to access organization wide information. It contains a forum for announcements, a customer relationship management module, a directory of all members, a database containing some general facts about each past project and a data pool and a helpdesk module. Since the current platform has been developed for more than 10 years and is mainly designed for unilateral communication from national to local level, the organization is currently evaluating how it can be replaced by a more interactive platform leveraging Web 2.0 applications such as wikis and social networking.

Figure 7. KM spectrum with MARKET TEAMS's key KM practices

	Transactional	Analytical	Asset Management	Process	Developmental	Innovation and Creation
KM Practices	▪ Help Desk Applications		▪ Document Management ▪ Knowledge Reporsitories ▪ Content Management	▪ Best practises ▪ Quality Management	▪ Skills Development ▪ Learning ▪ Training	▪ Communities ▪ Collaboration ▪ Discussion Forums ▪ Networking ▪ Virtual Teams

Table 6. Impact of shared workspaces on virtual teams and collaboration in AIESEC

Interviewee	Web 2.0 applications	Efficiency gain	Quality Gain	Commitment gain	New structures
Ken	Shared work-spaces	Yes, content can be more easily shared with each other and distributed in the organization.	-	-	-
Peter	Shared work-spaces	More efficient collaboration	-	-	Possibly less communication via email; instead coordination and collaboration via Google Spreadsheets
Richard	Shared work-spaces	-	-	-	New tracking tools based on spreadsheets
Hannes	Shared work-spaces	More efficient coordination, especially for virtual teams.	-	-	-

There is already a number of Web 2.0 applications used for KM on different levels of the organization as local chapters operate quite independently from the national level. Figure 8 provides an overview of the different KM practices in MT and the bottom part shows Web 2.0 applications used for supporting these aspects.

Some chapters use wiki platforms based on MediaWiki for facilitating project management. In general, information and experience reports from previous projects and manuals how to run a project are retrieved from the national web-platform and the local platform is used mainly for facilitating communication and collaboration between the members of project teams. In addition, they may guide project teams through the process of running a project.

Besides physical meetings, communication mainly takes place through emails but also through StudiVZ, a large German social network-

Table 7. Impact of Wikis on its knowledge repositories, content management and document management within MARKET TEAM

Interviewee	Web 2.0 Application	Efficiency gain	Quality Gain	Commitment gain	New structures
Ann-Christin	Wikis (Ilmenau chapter)	-	Before introducing a wiki in Ilmenau there was no knowledge repository. As people have started codifying knowledge and using it as a reference the quality has increased.	Only some people use them actively.	People use wiki page as a simple inventory management system
Frank	Wikis	-	In chapters where wikis are actively used (e.g. Münster), there are better project documentations More sustainable knowledge retention about past experiences	In most chapters wikis are not used actively. However, there are chapters where people actively use them	-
Anim	Wikis	-	In chapters where wikis are actively used more documentation than before; in this way there is an increase of the quality of codified knowledge	There is increased commitment for documenting	People are collaborating virtually with each other what they didn't do before

Figure 8. KM and Web 2.0 applications used for KM by MARKET TEAM

	Transactional	Analytical	Asset Management	Process	Developmental	Innovation and Creation
KM Practices	▪ Help Desk Applications		▪ Document Management ▪ Knowledge Reporsitories ▪ Content Management	▪ Best practises ▪ Quality Management	▪ Skills Development ▪ Learning ▪ Training	▪ Communities ▪ Collaboration ▪ Discussion Forums ▪ Networking ▪ Virtual Teams
Web 2.0 Applications			▪ MediaWiki ▪ Dropbox		▪ MediaWiki	▪ MediaWiki ▪ Dropbox ▪ Facebook ▪ StudiVZ

ing platform, and Facebook. These channels are therefore the main means of exchanging ideas and innovation. Skill development and training solely takes place in physical meetings and apart from providing manuals and explicit information on the national web platform, no specific web technology is used for this aspect of KM.

Following the general trend, members have started using free Web 2.0 tools for collaborating and sharing files with each other. Dropbox is mainly used for sharing and storing documents online. Google Docs and Spreadsheets and Mindmeister, an online mind map tool, are used for collaboration and idea generation. These tools were not specifically introduced by the organization, but just appeared to be useful and very often already known by members from personal use.

Impact of Web 2.0 Applications on KM

The following tables summarize the findings regarding the impact of Web 2.0 applications on these aspects of KM. The impact assessment is based on the AST model.

As the answers from the respondents in Table 7 suggest, wikis apparently lead to an increase of quality of codified knowledge in chapters where wikis are actively used. However, a main problem in many chapters is that only few people use them. According to Frank G. there are only a few chapters where wikis are used by a substantial number of people. As he supposes that in many chapters the critical mass of people using the application to make it attractive is not reached, a national wiki platform has been recently launched. The future will show if activity level will be higher on that platform.

Table 8. Impact of Dropbox on collaboration within MT

Interviewee	Web 2.0 application	Efficiency gain	Quality Gain	Commitment gain	New structures
Christine	Dropbox	Yes, more efficient than for instance email as files are updated automatically on all computers	-	-	More collaboration between people
Anim	Dropbox	Yes, as files are synchronized automatically on the computer of all people using it	Yes, there's more documentation than before	As it's very easy to use the application, people just use it	-

Ann-Christin N. explains that in her chapter the wiki platform is also used as a simple inventory management system. As MT runs many projects, chapters have a considerable amount of materials that they have to store. As an ad-hoc approach to inventory management, members of a project team created a wiki page in which they update the amount of materials available.

Both respondents in Table 8 agree that the use of Dropbox as media sharing tool has increased efficiency of collaboration. Anim thinks that there is a general increase of commitment in documenting and sharing files with each other. (See Table 9)

According to both interviewees social networking has increased the efficiency of communication. Christine points out that social networking has especially also lead to more communication between different chapters.

DISCUSSION

We used the findings from the two case studies to construct a framework of Web 2.0 applications that can be used for different KM practices. As it follows the structure of Binney's (2001) KM Spectrum we refer to it as "KM 2.0 Spectrum". Furthermore, the case studies enabled us to identify a number of potential impacts of adopting Web 2.0 applications for KM that are summarized in the KM 2.0 Impact Model.

In order to ensure the correctness, completeness and consistency, we presented and discussed the Web 2.0 Layer Model that was introduced

earlier, the KM 2.0 Spectrum and a list of impacts of Web 2.0 on KM with three experts both from academia and practice. Two of the experts are consultants in the field of social media and Web 2.0 at Deloitte and Logica and one of them is an associate professor at Stockholm School of Economics and researches the impact of social media on knowledge work in multinational companies. The protocol for conducting the validation was based on the guidelines by Audenhove (2007).

The interviews revealed some suggestions for correcting some smaller inconsistencies and presenting the results. The suggestions are already incorporated into the respective models presented in this text. Both consultants generally agreed with the impacts that we identified and confirmed that Web 2.0 applications can be used in the way presented in the KM 2.0 spectrum. We found out that a key impediment of using social networking in companies is the potential of knowledge leak to the external environment. According to one of the experts this is especially critical for organizations handling sensitive customer data, e.g. banks and care providers.

KM 2.0 Spectrum

Based on the findings from the case studies, we created a mapping between each type of Web 2.0 application and the KM practices it can be used for. This mapping is shown in Table 10.

Table 10 shows that *wikis* can be used for a number of different aspects of KM. They may be used as asset management tools as means of stor-

Table 9. Impact of social networking on communities and networking within MT

Interviewee	Web 2.0 application	Efficiency gain	Quality Gain	Commitment gain	New structures
Frank	Social networking	Yes, as it can be used very easily	-	-	-
Christine	Social networking	Yes, communication on social networks tends to be faster than e.g. email.	-	More communication across the boundaries of chapters	Replacement of email; People use social networks to stay updated about other chapters

Table 10. Mapping of Web 2.0 applications with KM practices

Web 2.0 Application	KM Practice	KM Spectrum Element	Source
Wikis	Content management	Asset management	AIESEC, MT
	Knowledge repository		AIESEC, MT
	Document management		MT
	Learning	Developmental	AIESEC, MT
	Collaboration	Innovation and creation	AIESEC, MT
Media sharing	Knowledge repositories	Asset management	AIESEC, MT
	Document management		AIESEC, MT
	Virtual teams	Innovation and creation	MT
	Communities		AIESEC, MT
Social networking	Communities	Innovation and creation	AIESEC, MT
	Networking		AIESEC
	Knowledge repository	Asset management	AIESEC, MT
Shared workspaces	Collaboration	Innovation and creation	AIESEC
	Virtual teams		AIESEC
	Training	Developmental	AIESEC
Blogging	Communities	Innovation and creation	AIESEC

ing knowledge and containing codified knowledge. As they contain codified knowledge they may also be used as a tool for learning or more specifically as a reference in the learning process of individuals as the AIESEC case suggests. Wikis also play a role as a tool for innovation and creation as they allow individuals to collaborate with each other. In both cases wikis have been used by people to come up with their own resources that facilitated their work practices (in the AIESEC case a portal page for different chapters and in the MT wikis have been used for a simple inventory management). As wikis can be used so flexibly in organizations they appear to be the "Swiss army knife" of Web 2.0 applications; being used for purposes that are not covered by other applications.

Media sharing applications including video sharing services such as Youtube or Google Video but also online storage and sharing tools such as Dropbox play two important roles in the context for KM. First, they can be used for simply storing documents and media files and making them easily accessible by a large number of people. Second, they facilitate innovation and creation as people can collaborate online without boundaries and create new content.

A third type of application that spans the asset management and the innovation and creation elements of the KM Spectrum is *social networking*. Some well known examples are Facebook, MySpace, and Twitter. From an asset management perspective a micro-blogging functionality, i.e. the possibility to post small messages that are shown to one's peers, can be leveraged as a kind of knowledge directory as people can use to locate specific knowledge assets by simply asking their peers. This can be a valuable complement to existing knowledge repositories as a key challenge has always been to find relevant knowledge assets easily. Social networking also plays a role for innovation and creation as it allows people to communicate with each other across departmental or even organizational boundaries. People may increase their awareness of activities in other organizational units and therefore improve net-

working and collaboration with people they would otherwise not have been in touch with.

Shared workspace applications such as Google Docs and Mindmeister play a role for both "developmental KM" and "innovation and creation". They may be used for virtual education purposes, such as online training sessions as demonstrated in the AIESEC case. In this way training sessions are not limited to physical meetings but can easily be conducted remotely as participants can complement voice interaction, which has been possible for a long time through telephone or voice-over-IP, by visual interaction using blackboards, mind mapping and online presentations. Shared workspaces also facilitate innovation and creation as people can collaborate with each other online although they might be at different places and work on documents at different times. These applications allow virtual teams to collaborate with each other in new ways as the AIESEC case suggests.

As *blogging* allows people to easily publish experiences and opinions they may foster innovation and creation as they may represent a new generation of discussion forum. Discussion does not take place in threads as in traditional online forums but people may discuss with each other by commenting on blog entries and referring to other's blog entries in their own blog.

The mapping that is shown in Table 10 is used for extending Binney's (2001) KM spectrum to come up with the KM 2.0 Spectrum. This framework shows which applications can be used for different elements of the KM spectrum and the practices it encompasses. It is shown in Figure 9.

Although there do not seem to be Web 2.0 applications associated with the spectrum elements "transactional KM", "analytical KM" and "process-oriented KM" the AIESEC case demonstrates that Web 2.0 technologies may enhance KM practices associated to these spectrum elements (e.g. process support tools based on Web 2.0 technology). Hideo and Shinichi (2007) demonstrate how analytical KM may benefit from social networking data to create knowledge. Further research might reveal more examples in these spectrum elements.

Some applications in Figure 9 are associated to a number of KM spectrum elements (e.g. wikis and social networking). This demonstrates that the boundaries between the different spectrum elements are fuzzy. The association of the different Web 2.0 applications should therefore only be seen as a rough orientation.

Impact Model of KM 2.0

We consolidated the findings from the two case studies and created a list of possible impacts from using Web 2.0 applications for KM. By having a look at each of the impacts and the Web 2.0 application that is related to the impact, we identified the socially-oriented Web 2.0 principles that reflect

Figure 9. KM 2.0 Spectrum

	Transactional	Analytical	Asset Management	Process	Developmental	Innovation and Creation
KM practises			▪ Document Management ▪ Knowledge Repositories ▪ Content Management		▪ Learning ▪ Training	▪ Communities ▪ Collaboration ▪ Networking ▪ Virtual Teams ▪ Discussion Forums
Web 2.0 applications			▪ Wikis ▪ Media sharing ▪ Social networking		▪ Wikis ▪ Shared workspace	▪ Wikis ▪ Media sharing ▪ Social networking ▪ Shared workspaces ▪ Blogging

best the characteristics of the respective application that have most likely triggered the impact. In this way it is possible to discuss the impact of Web 2.0 on KM practices on a higher level, i.e. independently from the application level. The impact table together with the associated socially-oriented Web 2.0 principles is shown in Table 11.

The first impact is mainly triggered by the "unbounded collaboration" characteristic of media sharing applications as applications such as Dropbox simplify sharing of documents.

The second impact benefits from the fact that people may use wikis and media sharing applications to contribute the content they consider relevant (user-generated content). Quality is ensured when a group of people contributes its knowledge and is engaged in continuously improving the shared knowledge (i.e. collective intelligence).

As wikis allow people to work together in creating codified knowledge independently asynchronously and from different places (i.e. unbounded collaboration) the efficiency of knowledge creation (impact 3a) may be increased. The same holds for social networking sites such as Twitter or Facebook (impact 3b) where people can post and react to micro-contributions independently from each other. Social networking in addition relies on the long tail as people may post micro-messages that they would otherwise not have expressed or just in an informal way (like during a coffee break) where there contribution would not have been captured. On the other hand unbounded collaboration and reaching the long tail in social networks may also lead to an increase leakage of knowledge (impact 4) as people can easily share organization internal knowledge with external peers.

Table 11. Impact of Web 2.0 applications on different KM practices

#	KM practice	Web 2.0 applications	Impact	Source
1	*Document management*	Media sharing	Increased efficiency of document and media sharing	Christine (MT), Anim (MT)
2	*Knowledge repositories, Document management*	Wikis, Media sharing	Increased quality of codified knowledge	Peter (AIESEC), Richard (AIESEC), Michael* (AIESEC), Erik* (AIESEC), Frank (MT), Anim (MT), Ann-Christin (MT)
3	*Communities*	Social networking, Media sharing	More efficient creation and sharing of codified knowledge	Richard (AIESEC), Erik* (AIESEC)
4			Increased knowledge leakage	Richard (AIESEC), Peter (AIESEC)
5	*Communities*	Social networking	More efficient communication	Ken (AIESEC), Richard (AIESEC), Christine (MT), Frank (MT)
6		Social networking, Blogging	More transparency within the organization	Richard (AIESEC), Ken (AIESEC)
7		Social networking	More communication across organizational units	Ken (AIESEC)
8	*Collaboration, Virtual Teams*	Shared workspaces, Media sharing	More efficient collaboration	Ken (AIESEC) Peter (AIESEC), Hannes (AIESEC), Christine (MT)
9	*Virtual Teams*	Shared workspaces, Media sharing, Social Networking	More efficient coordination	Ken (AIESEC), Peter (AIESEC), Hannes (AIESEC)
10	*Collaboration*	Wikis, Shared workspaces	Emergence of user-generated structures	Ann-Christin (MT), Peter (AIESEC)

As people may generate and share the content they wish (user-generated content) social networking applications and blogs may lead to an increase of transparency within an organization (impact 6).

The unbounded collaboration characteristic of social networking applications such as Facebook may trigger an increase in communication efficiency (impact 5) as people communicate with each other without boundaries. Sending messages, sharing files and instant messaging is all possible in one single application. This may also lead to an increase of communication across departmental boundaries (impact 7).

Shared workspaces like Google Docs and media sharing applications such as Dropbox allows people to collaborate without boundaries and may lead to an increase in collaboration (impact 8). This is also the reason why these applications and social networking sites may increase coordination efficiency (impact 9), especially in virtual teams.

As users can create their own content they may use applications such as wikis and shared workspaces for creating their own structures (impact 10) such as tracking sheets (as mentioned in the AIESEC case), simple resource planning (as seen in the MT case).

The findings suggest that the principle "network effects" does not play a major role for the impacts that Web 2.0 application have on KM practices of the two organizations. However, as the Web 2.0 Layer Model suggests network effects are important for most Web 2.0 applications (especially wikis, social networking and blogging) to work properly. Only if there is a critical mass of people using the application it increases it chance to becomebe successful. Therefore, it should be seen as a key enabler to those applications.

The impacts in Table 11 can be associated with the different steps of the KM cycle (Figure 1). The associations are shown in Table 12.

As impact 1 deals with the sharing of documents and media, we associate it with the "knowledge sharing" step. Impact 2 is associated with "knowledge capture and creation" as it deals with the quality of codified knowledge. Impact 3a concerns the creation and is therefore associated with the "knowledge capture and creation" step. As impact 3b deals with sharing of knowledge, we associate it with "knowledge sharing and dissemination". As a side-effect of impact 3b, impact 4 is also associated with "knowledge sharing and dissemination". As more transparency (impact 6) in an organization may lead to the discovery of new knowledge sources that would otherwise not have been discovered by people, it is associated with "Knowledge capture and creation". As a

Table 12. Impacts of Web 2.0 on different steps of the KM cycle

| #	Impact	Principles	KM cycle step
1	*Increased efficiency of document and media sharing*	1	Knowledge sharing and dissemination
2	*Increased quality of codified knowledge*	2, 3	Knowledge capture and creation
3a	*More efficient creation of codified knowledge*	1	
3b	*More efficient sharing of codified knowledge*	1,5	Knowledge sharing and dissemination
4	*Increased knowledge leakage*		
6	*More transparency within the organization*	3	Knowledge capture and creation
5	*More efficient communication*	1	Knowledge capture and creation
7	*More communication across organizational units*		Knowledge sharing and dissemination
8	*More efficient collaboration*	1	Knowledge capture and creation
9	*More efficient coordination*	1	
10	*Emergence of user-generated structures*	3	

more efficient communication (impact 5) and more communication across organization units (impact 7) may increase both knowledge creation and sharing, we associate it with "knowledge capture and creation" and "knowledge sharing and dissemination". More efficient collaboration (impact 8) and coordination (impact 9) may lead to the emergence of user-generated structures (impact 10) and eventfully may improve "knowledge capture and creation".

Based on Table 12 an impact model is created in which the socially-oriented Web 2.0 principles are related with their impact to the different stages and processes of the KM cycle. The impact model is shown in Figure 10.

By looking at Figure 10 one might assume that Web 2.0 solely impacts "knowledge capture and creation" and "knowledge sharing and dissemination". Apparently, those KM cycle steps are mostly impacted by Web 2.0 applications. How-

ever, we think that especially "knowledge acquisition" should be impacted by Web 2.0 application as it is related to learning which can be faciliated by Web 2.0 applications as the AIESEC case showed. But, since AIESEC's virtual education practices have only recently started, it was not yet possible to determine the impact of Web 2.0 application on them. Some research in this area was conducted by Kane and Fichman (2009) who demonstrate how wikis can be used for teaching and Andersen (2007) who examines Web 2.0's implication for education. We expect that especially the principle "unbounded collaboration" has an impact on "knowledge acquisition and application". For instance, the availability of powerful tools for long-distance learning may enable organizations to reduce costs by conducting training sessions online instead of having to meet.

Figure 10. KM 2.0 impact model
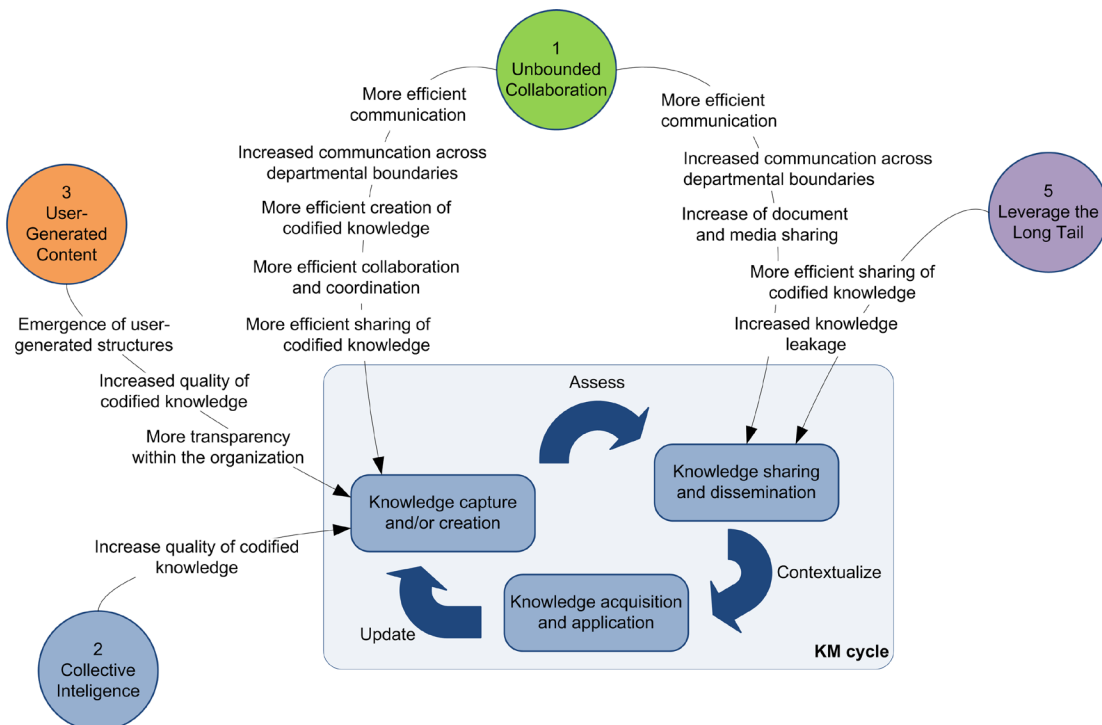
CONCLUSION

The findings from the research suggest that Web 2.0 applications may have a positive impact on KM as they may increase efficiency, quality and commitment of certain KM aspects but, coming back to the question that we raised in the introduction, do they actually usher in a new era of KM, a "Knowledge Management 2.0"?

Pointing to the limitation that we made early when we introduced KM, we do not believe that just introducing technology brings a change to an organization. This limitation also applies to introducing Web 2.0 applications in an organization as became apparent in both case organizations where interviewees pointed out that for instance the participation rate in wikis introduced by management tended to be very low. From a Technology Acceptance perspective (Davis, 1989) this problem may occur because people do not perceive wikis as useful or they perceive them as to difficult to use. On the other hand, when employees took the initiative and started using the application "Dropbox" bottom-up, it quickly spread out and eventually led to increased efficiency of collaboration. Apparently, this application did not suffer from low usefulness and/or ease-to-use.

So what can we learn from this? The difference between these two situations indicates that the users of a technology are better in determining if they consider it useful and easy-to-use than those who implement technology on behalf of management. Taking on this idea, we believe that if Web 2.0 applications are used in this way, they have the potential of having a significant impact on organizational practices. This is an extension of the "user-generated content" idea towards "user-initiated application selection".

Interestingly, one of our validation-experts told us that Yammer, an intra-organizational microblogging platform, is being adopted by more and

more organizations. Yammer is based on the idea that if they like it, employees just start using it within their organization. If management of their organization is also enthusiastic, they can upgrade the network to a corporate account and would gain access to the posted content and customize the application according their needs.

In this light, we see KM's role in fostering these user-initiated developments by providing the necessary means and incentives. KM 2.0 is not about enforcing new programs and tools from top-down. KM 2.0 is about listening to the people and encouraging bottom-up adoption of applications and encouraging user-participation.

FUTURE RESEARCH DIRECTIONS

The findings in this research are based on two case studies. In order to increase external validity of study, the research should be extended by conducting case studies in different types of organizations. Hence it would be interesting to have a look at other types of non-profit and for-profit organizations. As both of the case organization had quite similar KM practices, it should be looked at organizations that cover different aspects of the KM spectrum. These case studies should also encompass an in-depth analysis of situational factors that influence the impact of Web 2.0 application on KM. The outcomes would help organizations understand which levers they have to move in order to benefit from Web 2.0.

Eventually, the findings from the case study research should be used to conduct some quantitative research in order to derive some general conclusion about the impact of Web 2.0 on KM. The identified impacts could be used to design a survey to be sent to people in charge of KM in a larger number of organizations.

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KEY TERMS AND DEFINITIONS

Collective Intelligence: Describes the presumption that a large collective (of users) can develop more than a small number of experts (Knol et al., 2008). O'Reilly (2007) notes that one key enabler of the Web has been the use of hyperlinks that indicate which documents are interlinked with each other. By analyzing hyperlinks a considerable amount of intelligence can be created. O'Reilly indicates that in the Web 2.0 era hyperlinks have been complemented by additional mechanisms that analyze the behavior of users. One prominent example is an automatic suggestion system as that of Amazon.com.

Knowledge Management: The effective learning process associated with exploring, exploitation and sharing of human knowledge that use the appropriate technology and cultural environments to enhance an organization's intellectual capital and performance. (Jashapara 2004)

Leverage the Long Tail: A concept that allows for reaching out to the huge number of users and customers that represent a niche market. Thanks to approaches such as customer self-service and automatic data management in the Web 2.0 era, it becomes possible to leverage these markets. O'Reilly (2007) notes that successful Web 2.0 companies base a great deal of their businesses on the long tail of customers. This indicates a major change in understanding of e-business models.

Network Effects: Apply to services that get better the more users use them. Since the Web 2.0 is characterized by user-generated content, it greatly benefits from network effects. O'Reilly (2005) notes that successful Web 2.0 companies heavily depend on their ability to harness networking effects from user contributions. He also argues that real Web 2.0 companies and their services do not rely on advertising. Instead, their popularity stems from viral marketing - that is one user recommends the products to another and so forth.

Unbounded Collaboration: Indicates that users in the Web 2.0 world can collaborate with each other without boundaries in terms of time and location (Knol et al., 2008). In addition, Knol et al. note, users have an active role in the development of Web 2.0 applications by providing feedback or even delivering the content that would have traditionally been delivered by experts. One prominent example of such as collaboration would be social-tagging approaches (folksonomies) that let users assign tags to content resulting in a categorization that strongly reflects the users' needs.

User-Generated Content: One of the principal characteristics of Web 2.0. It breaks with the traditional way of publishing where spreading content was limited to professionals. In a Web 2.0 world, instead, users are enabled to create content and share it with each other. Consequently, large amounts of content are generated and available on the Internet.

Web 2.0: The reorientation of the Web that promotes unbounded interaction, collaboration and participation of people. It is characterized by the emergence of a large amount of content generated by a collective of Internet users. It harnesses networking effects and leverages the long tail.