Knowledge Sharing Through Increased User Participation on a Corporate Intranet

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Abstract

Due to the web browsers lack of editing features, the world-wide web and the intranets alike have de facto become “read-only” environments. We wanted to test how easy-to-use editing capabilities would affect user participation and knowledge sharing on an intranet. By introducing a wiki we were able to study how usage patterns were changed as the organisational members became more active. We found that lowering the threshold for particiaption increased user contributions significantly and argue that this increased information exchange will result in more knowledge being made available within the organisation. Hence, if people are willing to share knowledge and this willingness is facilitated by easy access to publication tools, we conclude that intranets may indeed become very useful knowledge management tools.

Keywords: intranet, wiki, knowledge sharing.

Suggested track: Knowledge sharing within and across organisations and cultures

Introduction

Designed to let individuals easily disseminate information across time and space, the World Wide Web (hereafter the web) was originally developed to be “a pool of human knowledge, which would allow collaborators in remote sites to share their ideas…” (Berners-Lee et al., 1994, p.76). The universality of the web, i.e., the fact that content is accessible from any browser and from any computing platform, indeed seems to make the web an ideal environment for collaboration and knowledge sharing. However, although Berners-Lee’s first browser enabled users both to create new pages and add new links, subsequent browsers allow solely “read-only” access to the web and the current situation is strongly biased towards browsing already existing texts. Hence, to the casual surfer the web is de facto a read-only medium with which they actually share very little information (Chang, 1998; Miles-Board & Carr, 2003).

Web technology is now also used within organisations in the form of intranets. In terms of publication patterns, these intranets follow the development of the public web:

content is to an overwhelming extent read-only and essentially provided via a centralised process where a small number of professional content providers are assigned the responsibility of maintaining the environment (Fagin et al., 2003). As a result, many organisations complain that their intranets have become under-utilised, and the trade press shows headlines such as “Why do intranets fail?” (Duffy, 2001). To abort this negative development and return to Berners-Lee’s original intention – “a system in which sharing of what you knew or thought would be as easy as learning what someone else knew” (Berners-Lee, 2000, p.36) – we argue that a higher degree of user participation on the intranet would positively affect knowledge sharing, and to examine this we have studied the use of wikis (explained in the next section) in intranets.

Re-claiming the editing capability

In a corporate setting, information creation (in form of e-mails, documents or web pages), information seeking and information interpretation are actions that describe the interaction between knowledge and information (Stenmark, 2002). Understanding the knowledge worker as someone who interacts knowledgeable with information and sees information not only as something derived from knowledge but as something that changes knowledge (Schultze, 2000), we see active contribution to the intranet by all organisational members as an important factor for successful knowledge management (cf. Hahn & Subramani, 2000; Stenmark, 2003; 2005). In this paper we describe an attempt to orchestrate a higher degree of user involvement in an organisation with a centralised and rather unused intranet by re-claiming the editing option.

As explained above, today’s Mosaic-based browsers do not allow editing of web pages. Since these form the basis of modern browsers (Miles-Board et al., 2003) it seems unlikely that they will be replaced anytime soon, and having up modify or replace every users’ browser in order to study their publishing habits would be too strenuous a task. A feasible alternative is to use a server-based solution such as a *wiki*. The concept of wiki was developed in 1994 by Cunningham, who had a desire to create a meeting place for interactions and discussions. The objective was to use web technology, to keep it as simple as possible, and to allow full collaboration, i.e., all users should have access to and ability to change and update the content and there should hence be no distinction between readers and writers (Leuf & Cunningham, 2001). The wiki web server typically contains all the functionality required to allow users to add, delete, and update web pages as they see fit, while still maintaining a record of versions.

There are indeed many different collaboration and communication technologies that let users contribute information, but they all enforce structure of some sort. For example, threaded discussion forums sort the content according to topic and thread and news groups and blogs sort content chronologically. A wiki, in contrast, is a server-side technology based on the community idea and presupposes the community members themselves (implicitly) to agree upon and maintain a working structure (Leuf & Cunningham, 2001). In other words, the users are allowed to design not only the content but also the structure, and the structure is thus not static but emergent and shaped by the users' changing understanding of the content. The wiki therefore always represents the community members' most current view. Stressing the differences between wikis and blogs, Cunningham states in a PC Magazine interview: "A blog tends to reflect the biases and opinions of an author, while a wiki is more like an open cocktail party. In a wiki you try to speak without a strong voice, seeking consensus to create something permanent, while on a blog you're developing your own voice and it's very much about your voice" (Rupley, 2004).

Despite the fact that wikis have existed for 10 years, there are no studies of wikis' possible role in knowledge management, on what effect – if any – wikis have on organisational knowledge sharing or how it may be used in an intranet. By focusing explicitly on these issues, our work contributes to the literature on organisational knowledge sharing in intranets.

Research setting and method

Since this is a study of how knowledge sharing may be facilitated on an intranet we needed access to a company willing to participate. We wanted organisations whose businesses were knowledge intensive, their employees computer savvy and the size of the firm manageable, and we therefore decided to contact small IT consultancy firms. Having e-mailed a dozen local companies in this segment telling them about our intended study and inviting them to participate, we eventually got in contact with one small IT consultancy firm, hereafter referred to as Citic (a pseudonym). Citic was founded in 1999 and had 24 employees, mostly consultants and system developers.

After a first meeting with a Citic representative where we in more depth explained the purpose of the study, they agreed to participate. We thereafter spent two weeks learning their current intranet implementation. In order to enable peer level information sharing, an intervention in form of a wiki server was needed and a version of UseModWiki (Adams, 2004) was installed on one of Citic's servers and customised to

fit our requirements. There are a number of different open-source wiki implementations to choose amongst and since this study does not exploit any feature other than those generally found in all wikis, we omit all details about the software installation per se. The corporate contact person introduced us and the wiki concept to the rest of the organisation at one of the monthly competence meetings. When presenting the project and the wiki, we chose not to give any usage guidelines since we did not want to impose any prejudice. We realise that a few illustrative examples of how the software could be used might have helped kick-start the participants but in this trade-off we favoured leaving the users unbiased.

After a two-month test period (April-May 2004) during which the employees were free to use the wiki at their discretion, we conducted eight semi-structured interviews. The interviews, which were conducted by three Master level students as part of their Master Thesis project, lasted 50-80 minutes and were all recorded and transcribed. One of the respondents was a sales manager whilst the other seven were system developers. The respondents had been with the firm between a few months to five years. Some of the interviewees were later contacted again via e-mail for complementing questions. The data was subsequently analysed by the students and a senior researcher independently.

In September 2004, the senior researcher returned to Citic and conducted interviews with the contact person and the general manager regarding the effects of the wiki. This follow-up was to learn whether the wiki was still in operation and if so how and by whom it was used. These interviews were also recorded and transcribed and analysed by the senior researcher only.

Citic also agreed to collect transaction log files from the wiki and make these available to us for analysis. Logging started on September 1st and was terminated on December 2nd, covering a period of 94 days. The log files gave us the name of the updated object, the time of the user's visit, and the IP-address of the user. Only updates (edits) to the wiki were recorded. The text below shows an excerpt from the log:

21 October 2004

Telephone list Citic . . 14.13 . . 192.168.9.33

Project documentation . . 12.38 . . 192.168.9.23

Empirical findings

Here we report our empirical findings, both the qualitative data received from the interviews and the quantitative data from the wiki log files.

Interview data

Citic had a very flat organisational structure with only one general manager and a high degree of autonomy and empowerment amongst the employees. The respondents claimed the firm to have an open information-sharing culture where it was okay to ask anyone in the organisation about anything. One informant argued that it was important that new employees picked up these values and got used to making self-governed decisions. The respondents agreed that sharing information and knowledge was a vital part of the firm's culture. Not only was it a responsibility, they argued, but also an opportunity to market your own ability and thereby receive recognition amongst one's peers. One respondent told us:

> "You do want to be thought of as capable and helpful. So if you can solve a problem someone else has been struggling with, that in itself as a kind of reward in my opinion."

The employees did not consider knowledge something that should be hidden and kept private. Several interviewees pointed to the risk with keeping important knowledge to oneself. It would be bad for both the firm and for the individual. Correspondingly, sharing such knowledge would benefit both the organisation, as it became more competitive and profitable, and the individual. One informant explained:

> "Obviously I'd help as much as I can since it increases my value. And it increases the value of all the others as well and that helps the company to become more successful, so it's a matter of course…"

The number one information media at Citic, according to the respondents, was e-mail. Via this channel, information from management, technical matters, reminders of all sorts, and social events were shared and discussed. However, the respondents repeatedly mentioned how they perceived e-mail as disturbing. The general meaning was that they received too much uninteresting e-mail, since much e-mail was top-down information sent out to everyone. The respondents agreed that most of this information was useful only to a minority of the recipients and the respondents would like this just-in-case messaging to be minimised.

The respondents distinguished between two types of information sharing; formal and informal. Whereas informal information sharing was a continuous activity that went on whenever employees met over coffee or called or e-mailed one another, formal information sharing occurred, the respondents claimed, primarily at the monthly face-to-face meeting led by the general manager. At these meetings, management brought up certain topics for debate, informed of important strategic issues, and invited various employees to present project status or technical news.

However, it was seldom or never possible to assemble all employees in the same room or even in the same building. Being a consultant means spending much time at customers' sites, which disables face-to-face communication with the colleagues at the home office. When employees are co-located, they often solve immediate problem by direct communication and the answers they arrive at can often be reused elsewhere in the organisation. Therefore it is important to make these solutions known also to employees who are not present, the respondents argued. A problem recognised by several informants was that Citic had no good medium for this sort of information sharing. One respondent formulated it like this:

> "The current options are too, eh… blunt. You can always *call* someone in person, and *e-mail* works for the entire group, but all the cases in between… You know, when you need to reach a subset but you don't know exactly who… That is difficult."

A second problem mentioned by many of the respondents was the lack of time. Information sharing requires typing things up and the respondents conceived this as rather time consuming. A third problem identified by the interviewees was the difficulty of knowing what information is important and what is not.

Prior to the introduction of the intranet, the only option when wanting to disseminate written text was then to store a document on a file server, which according to the respondents was meaningless since no one knew that the file existed or where it had been stored. The primary objective when introducing the corporate intranet was – and still is – to make information available to the employees, but the implementation had not improved the situation much. According to one of the interviewees this was due to the fact that it was difficult to publish and difficult to know what had been published. The information provided on the intranet is general corporate information applicable to all employees, such as corporate history, various policy documents, address and telephone directories, vacation lists, and meeting protocols. This information is

perceived to be static, long-term, and fact-based, and thus not in need of recurring updates. An info master had been appointed to manage the content and all information was supposed to go through him. The employees were not entirely happy with this arrangement, as it created a bottleneck whenever they had important things to share. Having an info master acting as a moderator made all information seem to come from the same source. One of the respondents explained:

> "When you are presented with information as on our intranet it is mostly like you're being *fed* information and it doesn't make you contribute in the same way, and that's perhaps a drawback."

The respondents believed that a shared and distributed responsibility for content provision would help keep the intranet more up to date. If the information is not updated and useful, they argued, the consequence is that the users will not return but seek the information elsewhere. However, in many organisations updating the intranet is a rather complicated process. One of the consultants shared with us his experiences:

> "I have been implementing an intranet for an organisation where they have a distributed administration and everything, but still only a selected few can publish. The consequences became obvious to me when I received requests for updates and noticed that these requests have gone through many others before reaching me. The one originally noticing the error had contacted someone who was not authorised, and he sent it to the webmaster and the webmaster, in turn, contacted me because I knew how to do it. Then you realise how much time is wasted just to correct a telephone number!"

This was pretty much the case at Citic as well. The respondents argued that having a too complicated process makes them reluctant to engage since it takes too much time. One user stated:

> "Perhaps we don't have the time [to spend on updates], but if no one updates the information, you won't log in and check since you know nothing has happened. It will become a negative spiral which eventually will lead to death. Like our intranet."

The fact that the intranet was not used much had caught the attention of general manager. When interview after the wiki had been installed, he described the former intranet and the low usage level in these words:

> "Our old intranet was a rather static thing, and we felt we needed to do something since usage was very low. We saw an opportunity to change our internal channels of communication. […] Our problem was keeping [our intranet] updated since it was person-dependent – there was one guy handling updates – and then you don't get the level of usage that you want."

The introduction of the wiki has, according to some of the interviewees, resulted in a new medium that fills a previous void in Citic's information environment. The respondents stressed, however, that a pull-based tool such as a wiki never fully can replace a push-based channel such as e-mail. When the employees need a quick reply to their requests they cannot rely on their peers to find on their own accord a post on the wiki. Instead, they send an e-mail to those they think may have an answer. The respondents therefore thought of the wiki as a complement to the traditional intranet and to email and claimed that information that is too heterogeneous and too unstructured for the intranet would be better off on the wiki. One user explained:

> "We have used the wiki for another sort of information than what's on our old intranet. […] It's a lot of sketchy ideas and very lose concepts… kind of muddled, and so."

The responsibility regarding information sharing was also influenced by the introduction of the wiki. The wiki was assumed to be a joint responsibility shared amongst all employees, and not just a task for the info master. The general manager saw this feature as a big opportunity to involve the employees more actively. He explained:

> "What is interesting about the wiki is that you get a distributed ownership of the information, so to speak. It's not like in the old intranet where the responsible info master did all the writing – then it was *his* information. Now everyone has the right to contribute and that gives you another attitude towards information… It becomes more "true" in a sense; you know that someone has made an effort to contribute."

The employee respondents were also positive to this shared responsibility and claimed to be more inclined to add and update information when the gatekeeper system was gone. One interviewee told us:

> "I think it increases the motivation to add information, actually. […] When you need to ask permission to participate, then you don't bother. You take the line of least

resistance so if it's not very important you just drop it. [...] But if updating is easy, you do it."

All respondents agreed that the biggest advantage with the wiki was that all employees easily could update and add information. This way they could share solutions and development tips to their colleagues without having to go, as earlier, via the info master. The typical example mentioned by many employees was the knowledge sharing that Citic tries to foster. One of the employees said:

"We try to share the sort of things we know that others may have problems with later or things we know take time to solve during systems development or so. It's that Do-like-this-to-make-it-work kind of knowledge."

Some informants believed that a shared responsibility for information provision would make it easier also for the info master. They also argued that they felt more involved in and responsible for the information on the wiki compared to the old information on the intranet. A majority of the interviewees said that not only were they more motivated to add information, they also claimed that the update frequency would increase as a result of the easy access. This, they argued, will make the content more alive and relevant. One interviewee said:

"I can publish what ever I feel like, really, without having to clear it with the info master, as it was previously. When I need to add something I can do it myself."

The former info master commented on the collaborative aspect of the wiki and how this contributed to the dynamic of the intranet:

"Information can be corrected and altered continuously; changed and enhanced. Otherwise, it was like when you take the minutes in a meeting; whoever holds the pen controls the decisions, sort of. Here, you get more interactive documents, documents that can be changed at any time by anyone."

In the wiki implementation used in this study, entries were logged with IP (Internet Protocol) numbers only. A majority of the users believed it would have been good to have names automatically linked to contributions, primarily since this would have made it easy to know where to turn with questions. Some users actually voluntarily choose to sign their contributions with their initials. One user said:

> “The benefit is that I can contact that person and say ’you wrote that and that – can you explain this part’. Besides, it’s sort of fun knowing who contributes and how much. But I see it as a very positive thing that you’re able to tell. It’s nothing to be ashamed of. To be a contributor – that’s a good thing.”

However, others saw drawbacks with making the identity of the contributor salient. Mainly they feared that shy employees would be more reluctant to share information would their name be published together with the post. They also argued that it would be easier to publish more speculative items if your name was not displayed. One employee noted:

> “I don’t have to know who the author of the text is. It may even be better [not to know], if it turns out to be false, since then you don’t want to be linked to it. You may be more outspoken if there are no such links.”

Unlike the old intranet the wiki initially had very little structure. This was not by accident but a design decision taken by management since they had noticed that the old intranet structure did not match their current business structure. As a small and independent consultancy firm they needed to be able to think outside the box. The general manager told us:

> “A traditional intranet only addresses predetermined issues, if you know what I mean. The frames of reference have been established and it’s difficult to move outside those frames. A wiki gives you more freedom. In our old intranet we had a fixed navigational structure – a menu on the left hand side of the screen. If I wanted to add a link [to the menu] I couldn’t; I wasn’t allowed. The framework was set. With the wiki you get away from that.”

The fact that the design of the information structure was left to the organisational members collectively was experienced in a number of different ways. Some saw the benefits of such an approach and stressed the opportunities that the absence of a pre-defined opened. The majority, however, claimed to be negatively affected by the lack of structure. One respondent in favour of the increased freedom said:

> “One good thing is that you can provoke actions… Perhaps I want people to contribute within a certain area; then I just add a link but without adding any information. That way someone will notice and start adding to it, and information will emerge once a forum is created. This is good since it’s so easy to add stuff.”

Many others had problems finding information or making sense of the information they did find. One of our respondents claimed:

> "The problem with the wiki was that it was so… well, there was a lot of data but like no structure and hence very difficult to take in the information. It just became a muddle of characters. There was a lack of structure, for sure."

The employees seemed to agree that the old structure had been far from optimal but a complete lack of structure did not seem to be the solution either. The general manager illustrated the mixed emotions felt by many of the organisational members when he wished for a middle way:

> "We had deliberately kept away from imposing any specific structure and I guess then a mix of things is what can be expected. Perhaps you have to impose some structure once in a while… I guess I'm the one to define the levels and the structure… or maybe it should be derived from the business plan? To link the information to our business plan… But our old navigation structure didn't at all match our business plan. The old structure was something that had evolved over years and it was totally irrelevant. There should be a way to build a smart structure that links to what you want to achieve and yet allows people to play and be creative!"

Log file data

As can be noticed from table 1 below, a majority (19 of 24) of the firms' employees contributed to the wiki during the monitored time interval.

Table 1. Number of edits per user during a 3-months period

User #	Number of edits
1	179
2	74
3	20
4	20
5	19
6	17
7	17
8	16
9	10
10	8
11	4
12	3
13	3
14	3
15	2
16	2
17	1
18	1
19	1
Total	400

The edits were not evenly distributed amongst the employees. One user (the former info master) accounts for 179 entries or almost 45% of the edits. Removing this outlier, the average number of edits per active user is 12.3. However, the second most active user has a high 74 edits which still skews the average upwards. The median number of edits, which is 6, may be a better description of the activity level.

In table 2 below, we see how the edits are distributed in relation to number of active days. The user with the most frequent updates was active on eight day, but most users did only contribute on a single day during the monitored interval. This resulted in an average of 2.63 active days per user but the median was only 1.

Table 2. Number of active days per user during a 3-months period

User #	No. of active user days	No. of edits
1	8	16
2	7	74
3	7	19
4	6	179
5	3	20
6	3	10
7	3	4
8	2	20
9	1	17
10	1	17
11	1	8
12	1	3
13	1	3
14	1	3
15	1	2
16	1	2
17	1	1
18	1	1
19	1	16
Total	50	400

The updates were not evenly distributed over time either, as figure 1 reveals. The 40 calendar days during which the 19 employees made their edits resulted in 50 active user days. A total number of 400 edits were made, but after removing the outlier, 221 edits remain, resulting in an average of 4.4 edits per active user day or 5.5 edits per calendar day.

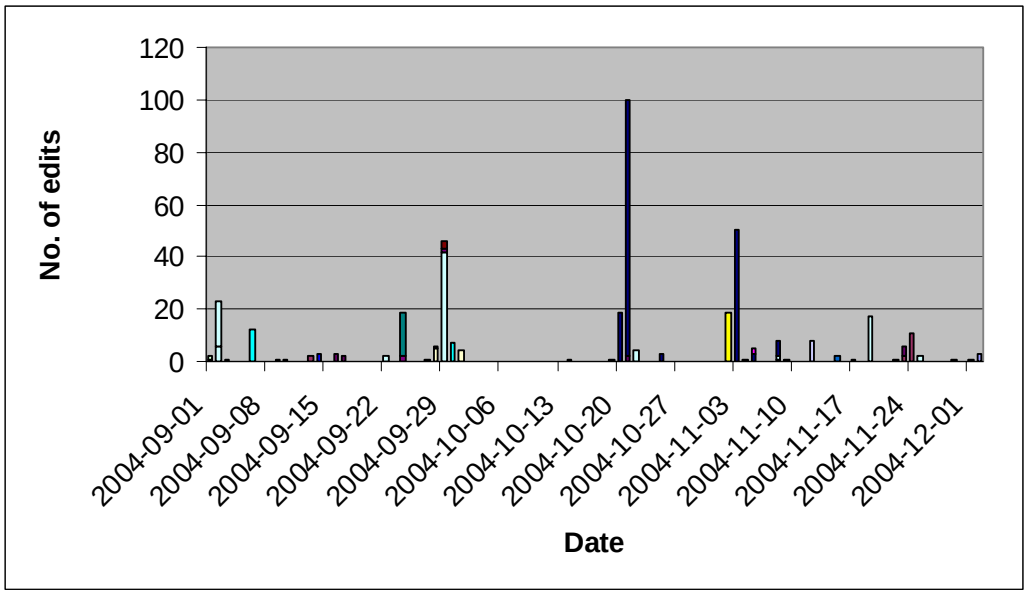

Fig. 1. Edits per user distributed over time

Forty calendar days during a period of 94 days means that activities were logged on 42.6% of the days. Since the interval included 13 week-ends, 40 days of activities

means 58.8% of the working days. In other words, the wiki was updated with 5 edits almost three days per week, and 79% of the firm's employees took part in the process.

The number of activities on any given day also differed significantly. On the busiest day (Oct. 21st) two users together made 100 edits (see figure 1 and table 3). However, the two busiest days were the result of the info masters efforts and when removing him from the sample, the busiest day had 46 edits (Sept 29th). A majority of the active days had only one active user, but seven days had two active users and two days had thee user making edits, as is evident from table 3.

Table 3. Each column represents one user. A number in a cell represents the number of edits for that user on that particular day. The shaded column marks the activities of the info master.

Date	Number of edits per user and date																		
Sept 1					1														1
Sept 2				6														17	
Sept 3																	1		
Sept 6												12							
Sept 9					1														
Sept 10					1														
Sept 13		2																	
Sept 14																3			
Sept 16					3														
Sept 17					2														
Sept 22				2															
Sept 24													2		17				
Sept 27												1							
Sept 28			5										1						
Sept 29				42									1	3					
Sept 30												7							
Oct 1			4																
Oct 14					1														
Oct 19		1																	
Oct 20									19										
Oct 21					2				98										
Oct 22				4															
Oct 25									3										
Nov 2											19								
Nov 3									50										
Nov 4											1								
Nov 5									3	2									
Nov 8		1		1					6										
Nov 9					1														
Nov 12								8											
Nov 15							2												
Nov 17		1																	
Nov 19				17															
Nov 22						1													
Nov 23		2			4														
Nov 24		11																	
Nov 25				2															
Nov 29			1																
Dec 1		1																	
Dec 2	3																		

Discussion

Intranets, when first appearing, were soon hailed as the ultimate solution to many organisational issues, including sharing of knowledge amongst employees (Scott, 1998). The fact that the technology enabled people from different computing environments to connect regardless of topologies or operating systems seemed to open unlimited opportunities. However, real life experiences tell a different story, and Berner-Lee's original vision of an environment to which you could easily contribute seems to have faded. Instead of employees actively sharing knowledge on a peer-to-peer level, the intranets have become one-way communications channels for corporate information. Newell et al. (1999) suggest that intranets are encouraging fission instead of integration and in fact are reinforcing existing barriers to knowledge sharing.

It has often – and correctly – been pointed out that technology in itself is not enough to ensure successful knowledge management: what is important is that a knowledge sharing attitude is fostered (cf. Davenport & Prusak, 1997). What is evident in the Citic account described above is that although the company has a working knowledge sharing culture, where the employees willingly share their experiences and help newly hired to learn the trade, this attitude alone is not enough to make the intranet a KM-enhancing environment. The Citic intranet was, as are so many other corporate intranets, characterised by static, long-term, general information provided not by the employees themselves but by an appointed information master. The introduction of the wiki caused a shift in ownership where the employees were given control. From a user involvement perspective this shift was positive and, as argued by Hahn and Subramani (2000), a good first step towards a knowledge sharing environment.

The browser is an ideal tool to casually surf the web by reading material authored by others and following links implemented by someone else. Undoubtedly, users may learn a lot by reading but this presupposes that there is useful information to read. Here lies the problem; most intranets do not contain information useful in the daily work. Whereas the web grows in a democratic and bottom-up fashion by contributions from interested users, intranet information is typically fed top-down by employees with no personal involvement in the information (Fagin et al., 2003). The Citic account suggests that the lack of information useful in everyday business situations depends not necessarily on the unwillingness to share but on the difficulties associated with a traditional approach to web publishing.

Above, we have heard the respondents testify that when the threshold is too high, no knowledge is shared (or merely shared with a selected few via e-mail). The collaborative authoring features offered by a wiki means that knowledge sharing can be distributed between many community members. If one employee starts, someone else may continue to add and a “best practice document” will emerge without burdening anyone contributor in particular. The wiki way differs significantly from the common approach where a web page is understood as a fixed document, owned and changed by the original author only (Chang, 1998).

This experiment started by us introducing the wiki as a new tool alongside the traditional intranet and six months later the company had thrown out the old solution and migrated all their content to the wiki environment. Instead of having *one* content provider (the info master), Citic now has *nineteen* users actively disseminating information. The old content provider is still active – in fact, he is the most active user – but he is not alone; he is being accompanied by a large majority of the firm’s employees. The Citic account shows that adding easy-to-use editing capabilities can vitalise a dormant intranet and transform it from a semi-static bulletin board to a dynamic knowledge sharing environment.

Giving all users unrestricted access to both reading and writing means that they have the option of overwriting or deleting (portions of) the content. This may sound intimidating since valuable content risks being destroyed. However, studies of public wikis show that although vandalism, such as mass deletion or offensive copying, occurs, the community takes care of such hostility by quickly restoring the site or page, often within minutes (Viégas et al., 2004). In addition, on a corporate intranet it seems unlikely that deliberate vandalism should occur and this should thus not be a concern. The positive effects of free access, i.e., increased empowerment, participation and knowledge sharing, are likely to outweigh any negative consequences.

We have seen that collaborative intranet authoring can work in small environments, such as the one described in this paper, but whether this approach can be scaled up to be useful in an international corporation remains to be tested. There is, however, nothing to suggest that this should be impossible. On the contrary; in their study of Wikipedia (www.wikipedia.org), a public wiki site reported to handle more than 3.000 edits per day, Viégas et al. (2004) note that both the technology and the social conventions that govern its use seem to scale very well. In addition, large organisations are made up by smaller sub-units and one approach could be to start by using wikis on,

say, department level or on functional level (e.g., system developers or project managers).

Although no data on the update frequency of the old intranet is available, it seems obvious that not only has the number of contributing authors increased but also the frequency with which the intranet is updated. During September there were only five working days on which the wiki-based intranet was *not* updated, and judging from the respondents' accounts this was not the case with the traditional intranet. Subsequent studies will show the exact nature of these user contributions and examine in more detail what sort of knowledge sharing occurs. It would also be useful to learn whether the amount of email has changed since the introduction of the wiki. It seems that a wiki would be a good medium for the undirected general information that filled the inboxes of the Citic employees. A third interesting aspect touched upon by the respondents in this study was how salient a user's identity should be made when contributing. A fourth and final area of future research would be to study how to strike a balance between structure and freedom, and how this affects organisational knowledge sharing.

Conclusions

A positive attitude to knowledge sharing is a vital and necessary prerequisite for a successful knowledge management initiative, since, without such willingness, investments in IT environments such as an intranet will have little or no effect. However, even when knowledge sharing is explicitly embraced by the organisation, the intranet may still live a languishing life and fail to contribute to the organisation's KM efforts, as shown in this paper.

We have argued that this is due to the fact that intranets (and the web in general) have become read-only environments. When users are being fed information without being able or encouraged to contribute by commenting, questioning, editing or adding, the users feel alienated and lose interest. The technological threshold is the hampering factor; since training often is required, organisations assign only a small number of editors. When this hinder is removed, e.g., by introducing a collaborative authoring tool such as a wiki, the employees directly can take an active part in the development of their intranet.

Our conclusion is that if people want to share knowledge and this willingness is facilitated by easy access to publication tools, the intranet may indeed become a very useful knowledge management tool.

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