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The Practice of Managing Knowledge

Finding the Balance between Information Systems and Talking Humans

Christian van ‘t Hof, Project Manager at the Rathenau Institute in The Hague, Netherlands

‘Knowledge’ and ‘Culture’: Organisational Intangibles and their Tangible Value

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The Practice of Managing Knowledge

Finding the Balance between Information Systems and Talking Humans

Christian van 't Hof, Project Manager at the Rathenau Institute in The Hague, Netherlands

Abstract

What is it that people actually do when they say they practice Knowledge Management? And why? They generally have two objectives. First they nurture the creation of new knowledge in order to speed up innovation and gain a competitive advantage. Second, by sharing existing knowledge they try to increase efficiency, i.e. prevent the wheel from being invented twice. Three kinds of practices to achieve these goals are described: best practice knowledge bases, Yellow Pages and communities. The cases described come from large multinationals, as they were at the forefront of KM developments.

Keywords: Knowledge Management, Best Practices, Knowledge bases, Yellow Pages, Corporate repositories, Communities of Practice, Case studies, Siemens, BP, Texas Instruments, Ericsson, E&Y, KPMG, British Telecom, Shell, Phillips

Introduction: Learning from Case Studies

We just finished a large Knowledge Management project involving a European consortium of 16 partners. We described and analysed over 300 good practices in ICT policy and made them accessible through an on line knowledge base. Everyone who is interested can go to www.beepknowledgesystem.org and search for cases that may suit their needs: networking SMEs, teleworking governments, municipalities bridging the digital divide, remote regions trying to get into the knowledge economy and, off course, managers managing knowledge. The project was funded by the European Commission, so we hope many Europeans will come to the website, go surfing through the content, read these cases and learn from them. At least I did, as I will demonstrate below.

The cases presented here deal with Knowledge Management and mainly come from large multinational corporations: Siemens, BP, Texas Instruments, Ericsson, E&Y, KPMG, British Telecom, Shell and Phillips. These organisations have large groups of experts, separated by distance, time and organisational boundaries. Connecting these experts, facilitating knowledge to flow freely, can give competitive advantage. Generally these companies went through an evolution, starting with the awareness of the importance of managing knowledge, then implementing large schemes to cultivate their knowledge bases to find out that, in the end, Knowledge Management is not merely about storing information, but primarily about stimulating communication between people.

Corporate Repositories, Yellow Pages and Communities

In all these cases, the technological core is the corporate Intranet, a very useful tool to codify and exchange explicit knowledge as well as enable interpersonal communication for exchanging knowledge. Intranets have a number of advantages. If well-constructed, they are easy to access and use, give universal access to information, enable rapid publishing and facilitate person-to-person interaction, while the networks are scalable and can also improve access to external sources. (Skyrme 1999, p.88) Focussing on the codification of knowledge, the databases running behind the web pages can be filled with good practices, just as in the Beep project. Focussing on the more personal exchange of knowledge, the intranet can also serve to enhance interpersonal connections by stating their expert profiles and contact information – corporate Yellow Pages. With connections, experts can form groups, exchanging up-to-date knowledge and generating new knowledge. In a word, they can form Communities of Practice. In sum, these are the three practices that generally occur when organisations start managing their knowledge. In the good practices analysed below, we will see that most organisations implement at least one of these practices, but mostly they work best in combination, exploiting both explicit and tacit knowledge, improving exchange of existing knowledge as well as stirring innovation.

Cultivating the Corporate Repository

Advances in web applications improved entry and access to the successor of the paper archive: the

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electronic repository. This can be seen as the technological heart of the organisation. And it grows rapidly. Seeing the importance of communication between staff members, more attention is paid to managing what goes in and out and how the information is structured. Once just an electronic tickerboard, with links to documents scattered on the server, the intranet web pages grew into an active brain running databases, leveraging the exchange of the organisational knowledge that can be codified and connecting people that would not normally meet down the hallway.

One exemplary company that took advantage of intranet as the prime knowledge platform is British Telecom. Their web pages developed into an internal news service, named Intellact, providing strategic business information that significantly paid back its investments. The home page focuses on headlines of top stories in the telecom sector and links to sources such as external research papers, internal market analyses, competitor analyses, etc. It has personalisation and customisation features so that every employee only get what they want. Employees can also subscribe to specific news services to be received via e-mail or SMS. Finally, the repository behind it can also be searched with a search engine.

As common as this may seem compared to any sophisticated content provider on the web, few companies establish such a service internally. Nevertheless, as BT claims, the returns on investment are high. According to a survey, Intellact has helped BT employees understand their competitive environment (89% agreed), understand their customers better (80%) and saved time and labour (62%). Also, Intellact took over the role of most external news providers, saving on subscriptions and contracts. The total cost saving is estimated to be at least € 20 million. (Woolf, 2001)

A comparable example comes from KPMG, an international service company that integrated all its digital traffic into one portal, K World. Besides presenting relevant outside sources, such as news from Reuters and Dow Jones or intelligence from OneSource, Lexis-Nexis and Gartner, K World communicates valuable material from its employees. For example: good proposals, client accounts, letters and market analyses. At the same time, K World serves as groupware, providing server space to project members and even to clients. This approach creates a one-stop shop, integrating all digital activities into one system. Therefore, traffic to news services flows more easily, as employees work all day on K World. (Southwood, 2000)

While the benefits of information exchange and the value of up-to-date knowledge are apparent, these portals cannot really be seen as sophisticated KM applications. For one thing, the information exchange is rather one-way, broadcasting interesting information but ignoring the most valuable source in stock: the work experiences of employees. Here we present two organisations that did succeed in getting valuable experiences from the work floor onto the web site: Siemens and Texas Instruments. These multinationals have their experts spread across geographic and organisational boundaries, while all their employees have valuable stories to tell. We start with the most classical example: the Texas Instruments Office of Best Practices, an organisation that to our knowledge was the first one to build a best practice knowledge base on such a scale.

The office started its work in 1994, and within three years it had identified over 530 best practices. Its knowledge managers define best practice as ‘a technique, tool, enabler, process or part of a process that works best to improve your situation’. The basic philosophy behind this sharing was summarised by its CEO at that time: ‘We cannot tolerate having world-class performance next to mediocre performance, just because we don’t have a method to implement best practices’ (Davenport & Prusak 1998 p.167). Knowing that their knowledge base would need both input as well as users, the office developed a network of 140 best practices-sharing facilitators worldwide. These facilitators gathered and promoted the practices and organised annual ‘sharefairs’ where they handed out the ‘Not invented here, but did it anyway’ award. The office also made great efforts to communicate the best practices through newsletters, e-mails, presentations, etc. Eventually, the internal website attracted a lot of traffic, over 10,000 hits a month in 1996. According to the magazine Business Intelligence (1999), the Office of Best Practices saved Texas Instruments over $.1 billion thanks to operational efficiency and process improvement.

Another multinational that succeeded in leveraging local experiences to a global scale is Siemens. The Siemens Information and Communication Networks Group, which provides telecom equipment and services, has a portal to their corporate repository named ShareNet. The kinds of practices described are solutions, applications, sales processes and projects, together with contact information. These practices are gathered from personnel and edited by editors on local, national and international levels. Being a multinational in electrical engineering, a lot of experiences can be exchanged, as lessons from engineering projects in one place can be employed in other places. The sharing of experiences works on three levels: between local project teams, between peer companies in countries in comparable market stages (e.g. US and Finland) and between countries in different market stages (e.g. Germany and India). This idea of market stages is based on the experience that countries go through rather similar technological development stages; each having its own needs for engineering projects. Here are two examples of salespeople who won a contract using ShareNet.

> […] it was crucial to landing a €3 million contract to build a pilot broadband network for Telekom Malaysia. The local salespeople needed to provide a reference customer in a proposal, but through ShareNet they discovered a team in Denmark that had done a nearly identical project. Using the Denmark group's experience, the Malaysia team won the job. (Business Week, 21 March 2001)

> In Switzerland, Siemens won a €460,000 contract to build a telecommunications network for two hospitals even though its bid was 30% higher than a competitor's. The clincher: Via ShareNet, colleagues in the Netherlands provided technical data to help the sales rep prove that Siemens' system would be substantially more reliable. (Gibbert et al, 2002)

According to Andreas Manuth, Manager of ShareNet, the portal had about 19,000 registered users and contains roughly 8500 knowledge objects in 2003. Business Week stated that the tool, which cost €8 million, has added €120 million in sales. Siemens has comparable Knowledge Management projects throughout its 460,000-staffed corporation. ShareNet is also used outside the ICN group. Perhaps in the near future, this website will serve as the KM portal for the whole company.

Both Texas Instruments and Siemens ICN show that building a corporate repository can be very profitable, but there is a catch to it. Other multinationals, like Ernst & Young, Shell and BP have had their corporate repositories too and proceeded accordingly, but all of them shifted to a more personal approach, aimed at connecting humans rather than databases. It proved difficult for them to just pick up lessons learned and transfer them to the rest of the staff. Reading the two quotes from the Siemens ICN salespeople; one cannot escape the notion that the corporate repository served as a contact database, matching experts who know to those in need, rather than being an oracle for recipes of success.

This was even more the case with Shell. Being aware of the advantages of Knowledge Management, this multinational oil company first spent a lot of time setting up a large repository, only to discover later that people were not eager to use it. Through user surveys it was determined that only 15% of time savings generated by the KM system were attributable to information in the knowledge base, with 85% of all savings being directly attributable to advice received via peers. Moreover, the cost of removing outdated knowledge from the knowledge base turned out to be higher than the cost of adding new data. Shell has stopped cleaning up the knowledge base, relying on users to determine the relevance of stored information to their situation.

Here we come to the issue of information systems versus talking humans. In the case of Siemens, some technical requirements for a proposal could be copied and pasted into new proposals, but for putting the knowledge into context, applying the lessons learned, personal contact was needed. This brings us to the next good practice in Knowledge Management: connecting experts through corporate Yellow Pages.

Connecting Experts through Yellow Pages

The most valuable knowledge for an organisation resides in humans, not in documents. As Collins & Parcel (2001) state 'The best medium for knowledge is the human brain and the best networking protocol is conversation'. Working in a small or medium-sized organisation, one can easily address co-workers for exchanging knowledge. Not that you could possibly know what everyone knows, but by asking around, you will eventually get to the right person. Wenger (2002) estimated that the average size of an organisation in which this is possible is up to a few hundred people. Beyond that, some matchmaking needs to take place in order to have the right people meet one another. This too is mainly a human effort, which rests largely with management. But technology can help, mapping the available experts, making their profiles retrievable through user-friendly search engines and providing up-to-date contact information. The biggest challenge is to get the right expert profiles, keep them up-to-date and draw in sufficient numbers of users. If this is established, the system works quite well.

Yellow Pages in their purest form can be observed at companies like Phillips and British Petrol, again two large corporations with highly dispersed groups of experts. At Phillips, the system was literally called 'The Phillips Yellow Pages' or 'PYP'. When last measured in May 2002, it had about 13,000 subscribers who all put in their profiles on their personal pages. These pages contain their business card, relations with external companies, key fields of interest and work experience. The employees can also fill in some more personal information, such as hobbies. These member profiles form the heart of the system. PYP also has a groups of 'gatekeepers', using 'Walt the Snow Owl' as its symbol. These gatekeepers are assigned professionals who are very well networked. When someone 'asks Walt', the system finds an appropriate gatekeeper and forwards the question for further action, either by that person or by someone in his/her network. Walt then sends a message to the questioner confirming who is dealing with it. Site statistics are also in place, showing that Phillips employees generate more than 3,000 activities each week. The interim financial investigations claim that the corporation's cost savings equal € 400 per answered question, covering the costs of a newly introduced system in less than a year.

BP Amoco Connect, a similar kind of Yellow Pages, was implemented when BP and Amoco merged. The idea was that the system would then facilitate the communication between the merged companies, opening up intellectual assets on both sides. The basic philosophy of Connect is to ‘create an environment where all employees can find the right expert and prevent the wheel from being reinvented through a ten-minute phone call’ (Collison & Parcel 2001). Employees present themselves by job title, team business unit, areas of expertise, languages spoken, internal and external contacts, favourite web links, photographs, cv, audio clip, network memberships and contact information. Like the Phillips Yellow Pages, BP Amoco Connect facilitates employees in maintaining their website themselves. Through this openness, people include interesting links to other sites and networks. A user surfing Connect can move from individual to network, to staff with similar expertise, to a favourite external contact. Moreover, the pages are made more personal as employees can add pictures. Actually, this turned out to be one of the most successful enablers: persons talk more easily if they have a face to look at, find out they have a common holiday destination or chat on how cute their kids are.

Connect was started up with a pilot of 500 staff members. After this pilot, focus groups were held to enhance the interface. The number of users grew rapidly to 10,000 employees in the first year. What contributed to this high rise was an awareness campaign, mounted by a group of heavy users. Also, when chairman Brown opened a personal page, this contributed to the popularity of Connect. After four years the number of users rose to 32,000, one third of the entire company.

These systems work quite well in stimulating knowledge exchange through conversation. Like the ordinary Yellow Pages, the whole challenge is to keep contact information up-to-date in an appealing interface. If one bit of advice from its implementers stands out, it is: keep things simple. The search interface should be simple, not overburdening users with useless information. In keeping the contact information up-to-date, the organisation needs to find a balance between keeping the content entry open to all subscribers on the one hand and gently forcing them to fill in required categories on the other. The openness stimulates commitment and rich content, while the obligatory categories feed the search engine. Surely, promotion campaigns are needed too to get employees into the system and build trust that it is actually working. The worst-case scenario is a deadlock: no users come in because there are no valuable contacts in the system; therefore, nobody enters their contact information.

The main problem of Yellow Pages from a KM perspective is that valuable knowledge is lost. The exchange takes place between two persons talking, while one of the benefits of knowledge management is to scale up the exchange, transferring valuable lessons to wider groups. Therefore, some companies have taken the effort to store these valuable exchanges, as well as make them retrievable for others. The KM system then takes a hybrid form, in between Yellow Pages and best practice knowledge bases: a searchable repository of questions and answers.

Mobile phone manufacturer Ericsson has taken this hybrid approach to its extreme when they piloted Organik. This system scans e-mails of participating experts, seeking to match current questions to past answers and building expert profiles accordingly. One could wonder if employees are happy to be monitored like that, but according to the manager of Organik, Anders Hemre, people don’t mind. This opens up a lot of possibilities for KM. Surely, to feed the system in the beginning; experts need to have a previously stated profile, as in the Yellow Pages. Organik users can select a person from his/her profile and e-mail a question, they can search with key words from previous dialogues or type in all sorts of work-related questions in natural language. The expert profile is constantly updated with items from the dialogues and if comparable questions were answered properly in the past, they will reappear. If not, the right expert is targeted through a content analyses of all information flows from Ericsson’s staff involved.

This is surely an interesting case, as it goes pretty far in monitoring knowledge exchange. At the time of writing, Hemre had just started his KM initiative as a pilot at Ericsson Research in Canada and had attracted 400 users. But he can already teach others some interesting lessons. First, he found out that it is hard to involve the best experts: they already know and don’t need the system. Second, 91% of the questions get an answer. It turned out to be easier to get answers than questions (one would expect the opposite). Perhaps a moderator should raise some questions in the beginning to feed the system. Finally, discussions don’t tend to form long threads; they are rarely longer than 10 messages. This last point is a bit disappointing, because the system was also meant to stir lively discussions between experts who would regularly return to the debate. In other words, Organik needs to facilitate building Communities of Practice.

Building Communities of Practice

Communities are very well described by Wenger, Mc Dermott & Snyder in their book ‘Cultivating Communities of Practice’ (2002). They define Communities of Practice as:

> […] groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis […] People within this network do not necessarily work together every day, rather they meet because they find value in their interactions, sharing

> information, insight and advice. Together they create an identity of this community and put it to use for their expertise, creating tools, standards, generic designs, manuals or other documents, but, above all, a common understanding of what they do in their work and how to improve their performance. (Wenger, Mc Dermott & Snyder 2002, p.6).

After putting a great deal of effort into building impressive, all-encompassing knowledge bases in the late nineties, practitioners of Knowledge Management are currently tending to see human contact as the way to exchange knowledge and stimulate innovation. (Collins & Parcel 2001, Wenger, Mc Dermott & Snyder 2002 and Davenport & Prusak 1998) The case of Shell proves this point: only 15% of time savings were achieved using the knowledge base and 85% by employees just talking with each other through the system, while the ratio in the investments were exactly the opposite. Within Shell, Communities of Practice are described as 'groups that share insights and have common interests, and set their own membership norms' (Boyd, 2001). Sometimes members meet physically, but most communication takes place online. Almost half the company is now involved in one or more of these communities. According to Andy Boyd, Knowledge Manager at Shell,

Shell is full of highly intelligent engineers to whom story-telling is anathema. The oil industry's multi-company exploitation projects require people to be able to share experience among projects spread around the globe. Typically this has been done by moving people to the sites at which their knowledge is required. At any one time, over 80% of the international technical professionals used by Shell will be away from home, with 30% of skilled staff moving in any one year. (Boyd, 2001)

Therefore, Shell looked at ways to exchange knowledge through electronic communication and has been involved in stimulating communities since 1996. By 1998 Shell had helped to start 107 different CoPs around the world, with between 20 and 300 members in each group. But they found that the communities were not communicating with each other, so in 1999 they started to combine them into three global networks: Surface, Wells and Subsurface. In addition to the initial three main technical CoPs, eight other communities were formed for global functions, e.g. procurement, benchmarking, competitor intelligence, KM and IT. Most of the costs are attributed to people costs, not for the IT systems. In total, 20 people work on coordinating the system. Each CoP has 1-2 full-time global coordinators (facilitator), 1 hub coordinator per country of operation (about 1 day a week), and a set of subject experts. The estimated return on investment comes from an extensive list of savings made through good advice: € 200 million.

A measurement made in 2001 shows that, on an average day at Shell in just one CoP, there were about 4 new users, 80 postings, 350 log-ins and 350 files viewed. Each entry typically has 60 views and 3-4 replies. Members spend on average less than an hour a week looking at messages on the discussion group. Messages are responded to by relevant people within a few hours because each of the integrated groups has between 1000 and 4000 members spread around the world. Some discussions are repeated, but this actually helps new people learn faster, while experts say they learn more by simplifying their expertise for wider use.

Shells competitor British Petrol took a different entry into in KM, but achieved similar results. The BP Amoco Connect website first served person-to-person communication, but soon developed into a tool to form communities. Shell and BP both learned that the key to a lively community is a good moderator. According to Collison and Parcell (2001) this is 'a central person and also a person in each team who has bought in to the process. Best is someone who talks a lot. He has to get out there, find information and feed it back again'. Wenger, Mc Dermott & Snyder (2002, p.80) also assign the moderator a central role: 'This person identifies the important issues, manages the boundaries, organises events that create a rhythm, connects specific members and helps to build practice.' The two oil companies also learned that it is important to identify a set of energetic first members for each discussion group who can serve to encourage users to join in the discussions. This is an essential lesson in building communities: they are not implemented top-down; they need to be stimulated bottom-up. Therefore, management needs to be sensitive to whoever is out there in the organisation developing initiatives for knowledge sharing, facilitating the urge to communicate among employees. This is excellently demonstrated by Siemens, where a lively community stirred the multinational to take up KM.

Siemens ShareNet has already been described. This project would have been different if it weren't for a group of 15 enthusiastic employees who started talking about KM in the mid-nineties. They shared their know-how on a rather informal basis and met regularly online as well as face-to-face. The group developed as informal communities do: no particular mandate, and participation was voluntary and open to everyone who was or wanted to be in the area of KM. But as the community grew to over a hundred members, the need for professional support, co-ordination, standardization and lobbying in its discipline became urgent. A request for support resulted in an interdisciplinary KM task force at corporate level, which consisted of several community members who reported to a management steering committee. A council was formed to identify the official representatives of the business units that could discuss and evaluate joint KM actions.

In October 1999 the Siemens Corporate Knowledge Management office was a fact, with its own special mandate and resources. By that time, the Community of Practice on KM grew to 350 members. So the informal KM organisation was still alive. But this wasn't the only KM activity: there were over a hundred more KM initiatives throughout Siemens, which could now count on support from the CKM office. Together with all other KM initiatives, the creation of the Corporate Knowledge Management office contributed to the reputation of Siemens as a highly respected learning organisation, serving as a benchmark for others.

Implications for Management, Research and Future Practices

Knowledge Management is an organisational approach that is not easily implemented. On the one hand, knowledge-sharing activities depend on the voluntary participation of employees. Therefore, management should be sensitive to the knowledge activities that are already going on within the company and seek means to support them. On the other hand, management needs to implement some organisational change in order to change the corporate culture. Employees can have all sorts of reasons for not joining in, and employers who see benefit in KM have a hard time changing the corporate culture accordingly.

Some objections of workers can seem quite practical. They say they don't have time for Knowledge Management, as they need to meet deadlines. Others could even be outright selfish, as they shield off their knowledge from potential competitors. More fundamentally, organisations might end up in a 'knowledge sharing paradox': the most knowledgeable workers are the least willing to share, while the least knowledgeable ones are most willing to share. A knowledge-sharing culture can only find fertile ground if top management supports it, showing benefits and rewards to those who do. Therefore KM cannot be just another project on the side; it requires structural change in the policy of the company.

In the current case studies, KM projects took place under broader organisational changes. The Siemens case shows how changes can come from inside, resulting in a whole array of KM initiatives throughout the company. BP took KM as a strategy to smoothen the merge with Amoco. Ernst & Young created a number of new offices to stimulate knowledge-sharing, while it also rebuilt the organisation's IT infrastructure for the sake of compatibility. All cases show that the KM initiatives resulted in new positions, such as Chief Knowledge Officer (CKO), Network Coordinator or Moderator for Communities of Practice. Some organisations, such as Siemens, also stimulate the use of KM systems with incentives, so-called Sharemiles – a currency that can be exchanged for conference tickets and other knowledge entries.

These organisational changes, resulting in new positions, expensive IT projects and spending of staff hours need to be legitimated in one way or another. Therefore, most cases show the management's efforts to prove a pay-off. The Texas Instruments Office of Best Practices can be seen as a champion, with over € 1 billion of savings due to knowledge exchange. Still, the calculation of these benefits is merely based on anecdotes. Quotes from Siemens are shown above. BP and Shell also have quite some anecdotes in stock, like these:

> Pecten Cameroon found other operators had achieved production gains by injecting a demulsifier downhole in gas-lifted wells; this increased production by 500 barrels a day; across 17 wells = € 9 million a year. (Boyd, 2001)

But the plural of anecdote does not equal evidence. The important omission in these calculations is what the costs of managing knowledge were. Not in terms of the hours made by the implementation team, or the costs of the IT structure, but the costs of repeating mistakes. Natural for knowledge is that it changes constantly as new experiences refute old ideas. Not every good new idea will work everywhere. Caution is needed.

Another way to estimate the benefits is to conduct a corporate survey. KPMG, British telecom, Shell and Phillips did this. But how do employees then estimate their savings to be contributed to KM? Still, in the end, Knowledge Management comes down to trust: trust between employees that the knowledge they exchange is valuable, trust from the employers that their employees use the attributed KM resources well and trust in a corporation where KM will work – if not in the short term, perhaps in the future. KM developed during economically prosperous times. How will it continue, now that organisations are cutting back? Did it prove profitable enough to maintain?

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Note: sources for the case studies can be retrieved from www.beepknowledgesystem.org.

About the Author

Christian van 't Hof has been a researcher for nine years. He graduated as a sociologist and has since done research and lectured on KM, organisational change, Information Systems, innovation, Science & Technology, Media and Art.

Example: One of his most favourable projects has been Beep, a EC project he done for RAND Europe along with 16 partners. Beep stands for Best e-Europe Practices and resulted in an on line knowledge base with good practices in ICT policy, which is freely accessible on www.beepknowledgesystem.org. This knowledgebase also provides many case studies on KM.