Knowledge Sharing in Heterogeneous Groups: An Empirical Study of IT-Support for Sharing Better Practices

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Abstract

The paper reports from a study of knowledge sharing in a large and complex organisation. The objective of the study was to gain an in-depth understanding of the implementation and use of a web-based knowledge sharing system designed to facilitate the circulating of best practices among middle managers. We followed the system from its introduction in early 1997 until it was abandoned in the beginning of 2000. We focused on the way the system was introduced in the organization, how it changed, and how the intended group of users received (and eventually rejected) the system.

1. Introduction

Beta Corporation (a pseudonym) is a large company in the European pharmaceutical industry employing more than 14.000 people. Like all other companies in this industry it is completely dependant on having new drug applications accepted by drug administrations around the world, and especially by FDA in the US. In 1992 FDA enforced a more stringent application of the standards, but Beta headquarter did not understand the implications of this change in practice, though quite a few people within the organization must have realized that this was far more than just a routine check of procedures. A new product was not accepted because of insufficient documentation, and a lot of money was lost, enough money to create a crisis in the organization.

Since the problem was lack of communication between departments and people, and especially between affiliates and headquarters, the company could not react by enforcing more control. No rules were broken and more control would not have solved the problem. A knowledge map with a "yellow page" service like the one Hoffmann-Laroche implemented in a similar situation (Seemann 1998) would not have solved the problem either, because no one in headquarter asked for this information. The observa-

tions and viewpoints that reached headquarter too late was of the kind that is pushed through an organization from many sources and through many channels, and completely dependant on peoples initiatives.

The senior management realized that the only long term solution was to give employees further down in the organization more power to make decisions, requiring in return a high level of accountability and willingness to share information, viewpoints and best practice.

The result was the implementation of new managerial principles, called "The New Way of Management" based on 10 Fundamentals, the first of which read, "each unit must share and use better practices". The keywords were "top-down delegation", "cross functional integration" and "shared learning" and the implementation was supported by two major principles. The first was "use of experienced people". Fourteen experienced managers from around the globe, representing all business functions were appointed to facilitate sharing of best practices throughout the organization and to ensure compliance with the Fundamentals. The second principle was "use of peers". The New Way of Management should encourage unit managers to call their peers instead of headquarter to solve problems and improve their operations. It should "support the company to become a well run decentralized organization, bounded together by strong informal network on the level of the units/subsidiaries" as it was phrased in an internal newspaper.

A management strategy building on informal networks is not easily implemented in a global company. The fourteen facilitators were traveling more than 100 days per year to help the units implement the new management principles. They encouraged the sharing of best practice by bringing people with similar problems in contact with each other and by encouraging all managers to input their best practice solutions into a custom build "SHARE" database (a pseudonym), which was accessible and searchable by all employees.

The "SHARE" database, which was installed in 1996, played an important role for the implementation of the second principle, "use of peers", or more accurate for the use of documents in the dissemination and re-use of practice within a group of peers. This is the focus of this paper.

Two recent studies (Dixon 2000; Markus 2001) discuss distinct types of knowledge dissemination and re-use situations according to the relations between the knowledge producers and the knowledge re-users and the purpose of the knowledge re-use. Markus identify four different knowledge re-use situations, which she calls the re-use among shared work producers, shared work practitioners, expertise-seeking novices, and secondary knowledge miners. (Markus 2001)

Markus defines a group of shared works practitioners, as a group of people who share a community of practice by occupying the same roles in different locations, work units or organizations, a group who produce knowledge for each other to use. The interest in this group of people is based on the assumption that they will find it easy and inspiring to use documents for knowledge dissemination and re-use. They have on one hand sufficiently different experience to stimulate learning while they on the other hand have the general knowledge and the specific knowledge about important dimensions of a context that they need to interpret shared documents. Brown and Duguid describe this assumption bluntly under the label "Network of Practice". People in such networks "have practice and knowledge in common", though they may be unknown to each other,

and "their common practice allows them to assimilate communications in more-or-less similar ways" (Brown and Duguid 2000b).

Some of the most acclaimed web-based knowledge sharing systems are based this assumption. Xerox developed "Eureka" to support knowledge sharing among the field service technicians whom Julian Orr studied (Brown and Duguid 2000a; Orr 1996) ,and Hewlett-Packard developed the "Trainer's Trading Post" as knowledge sharing medium for the 2000 teachers and trainers distributed around the company (Davenport 1998). These systems were developed in much the same way as the Beta Corporation developed the SHARE document base for the middle managers.

This assumption, however, is based on a rather vague account of what it means to "occupy the same roles" or to "work on similar practices". The words "same" and "similar" may add too much stress on similarities rather than differences. Recent studies indicate that the picture may be more complex. Orr observes in his study on Eureka that Xerox' technicians found it difficult to decide how much context they should define in the writing and how much they could leave implicit (Orr 2000). Orr and Markus notes that even competent members of the same community of practice may lack the contextual knowledge needed to interpret the documents.

This study is a contribution to the research in web-based knowledge sharing within a network of practice or a group of shared work practitioners. We study the use of shared document repository for sharing better practice among a group of people who were defined as "peers" by the senior management in Beta.

2. Research site and methods

We studied the introduction and use of a best practice database in Beta. It is a knowledge-intensive company with strong ties to universities and research hospitals, and production facilities, and research centers, and sales offices in more than 60 countries. More than 3,000 of its employees work in R&D. Beta describe its own organization as a "global network of autonomous power centers." Divisions, business areas and subsidiaries are loosely coupled and individual business units and departments have much autonomy.

The SHARE database was implemented in 1996 with the objective to create an electronic repository that would enable Beta's managers to exchange "best practices" over the company's newly established intranet. The idea was that managers, who had identified an effective way to perform a process, would submit a description of the practice to the common on-line repository so that other managers could quickly learn about it. The goal was not to specify everything about a best practice but rather to provide enough information to allow other interested managers to evaluate the practice and contact the author for more details. The company's staff designed and implemented the database in collaboration with external technology consultants.

2.1 Data Collection and Analysis

The research described here focused on the implementation and use of the SHARE database over a three-year period, from its introduction in 1997 until the end of 1999. The objective was to gain an in-depth understanding of the implementation and use of the SHARE system, from its introduction in early 1997 until it was abandoned in the beginning of 2000. We have focused on the way the system was introduced in the or-

ganization, and how the intended group of users received (and eventually rejected) the system.

We followed an interpretive case study approach (Myers 1997, Walsham 1993). Detailed data collection was primarily conducted through interviews and examination of documentary materials, including the SHARE database. Most of the interview data came from a series of in-depth and unstructured discussions with two deep informants - the designer of the first version of the system and the project manager who was responsible for the design and implementation of the SHARE system during the period we focused on.

The conversations with the key informants were supplemented by 15 more structured interviews with system designers, "moderators" (reviewers, see below), and managers (as users of the system). Each interview lasted between one and two hours and all interviews were tape recorded and transcribed. The interviews were undertaken over a 17-month period (August 1998 December 1999), during and immediately after the implementation of the system. The materials reviewed included firm documents such as annual reports and promotional material, internal newsletters, as well as materials specifically about the SHARE database such as user manuals, statistics about use, internal evaluations and strategy documents. In addition we had access to the SHARE system itself through the company's intranet as well as a snapshot of the database as of spring 1999 on CD-ROM. Together, the Finally, at the end of the project, we participated in an official meeting with system designers, senior consultants and "moderators" at Beta in June 1999. The purpose of the meeting was to evaluate the use and impact of the SHARE system as well as discuss alterative strategies.

We analyzed all of these data sources together and iteratively to get as complete a picture as possible of the design, introduction and use of the SHARE system. We shared our preliminary findings with the two key informants in the company, and they provided helpful comments, which confirmed and elaborated the identified issues and conclusions drawn (Klein and Myers 1999), (Fontana and Frey 2000)

3. Case Study

3.1 Organizational Background

The "New Way of Management" is a comprehensive description of visions, policies, quality guidelines and management principles. It was developed and decided by corporate management, and was considered not as a revolution, but rather as a codification and a further development of some essential feature of the existing practice, yet as something that definitely would have a major impact on communication and management within the organization.

Corporate management took three initiatives to support a fast and efficient implementation of the "New Way of Management" in Beta:

The Fundamentals. A set of management rules were written, called the 10 Fundamentals. The purpose of these Fundamentals was to elucidate the norm of good management within Beta. These norms are described as general and fundamental in the sense that they are the same for everybody and relevant to all units in the organization despite differences in geography, culture, type of business, size etc.

The Facilitators. Corporate management appointed 14 internal consultants, called "facilitators" to help the managers to cope with the changes and the new responsibilities. The facilitators were also to monitor how each manager and business unit complied with the 10 Fundamentals. The facilitation concept was adopted from ISO 9000. Corporate Management emphasized that the facilitation process should be considered as a way to help realize the intentions in the "New Way of Management". However, the implementation of the 10 Fundamentals was a requirement and any failure to comply with them would have severe consequences for a manager. In order to evaluate the implementation of the "New Way of Management" and the 10 Fundamentals, facilitators visited each organizational unit periodically.

The SHARE system. The very first rule of the Fundamentals states that each unit must share and use Better Practices, within not only a unit but also cross-unit, cross-functional or cross-organizational. In order to ensure continuous improvement of the content and quality of the company's processes, managers and employees must describe and exchange better practices with colleagues, formally as well as informally. A better practice is defined as "a practice or process, which will improve your unit's performance, e.g. improving efficiency, productivity, job satisfaction or in other ways add value. The SHARE document base was established to support the exchange among the managers regardless of geographical location, their experience and knowledge in the form of best practices.

The corporate management attached great importance to the SHARE-base as help to maintain, disseminate and share the knowledge and the experiences that the managers acquire in their work. SHARE was developed to support the corporation-wide exchange of managerial experiences and knowledge, and to facilitate sharing of better practices across geographical distances and organizational boundaries.

The use of SHARE was guided by the following rules. A Better Practice submitted to the document base had to conform with certain minimal criteria: (1) It had to be in actual use in one or more units, (2) it had to be transferable to at least one other unit, (3) the proposer had to indicate why she found it to be better than other common practices and business routines, and finally (4) it had to comply with the content of the 10 Fundamentals. A submitted Better Practice should include the name of a contact person who would be able to supply additional information and help implement the practice. Better Practices can be found by a directory structure or by using a free text search facility.

Although SHARE was intended for managers, it is easy for everyone to access on the corporate intranet. Not only do all employees have access to the base, they may also read and comment on what they find, and even submit, a Better Practice. The SHARE system and the document base is frequently copied on CD-ROM and sent to offices and subsidiaries with no intranet access.

3.2   Implementation and Use of the System

The implementation and use of the SHARE database can be divided into two distinct phases. In phase I, corporate headquarters concentrated on marketing the database within the organization and promoting system usage, while in phase II they focused on redesigning the software – in particular the user interface – and introducing a review process in an effort to improve the quality of the database and meet/satisfy some of the users' criticisms of the system.

Phase I: Introduction of the SHARE database

SHARE was introduced in January 1997. Beta took great effort to inform people about the new facility at meetings, in newsletters and on the intranet. SHARE got a direct link to the Intranet portal and when visiting the different units the Facilitators encouraged people to use the system. A Facilitator said that they considered themselves as the SHARE ambassadors.

At the outset, Corporate Management attached great importance to the quality of the contributions to the document base. The Facilitators reviewed all Best Practice-suggestions before they were uploaded into the base. They rejected more than half of the contributions, and people soon gave up submitting new suggestions. The SHARE system 'owner' (manager in charge of the system) at the time of our study said that:

The first time this committee of Facilitators reviewed the suggestions submitted for SHARE, 8 out of 10 were rejected – and that was unquestionably killing any commitment.

After only three months senior management decided to abandon the review system so that people were allowed to upload documents without prior endorsement and without any kind of limitations. At the same time the expression 'Best Practice' was replaced by the less ambitious term 'Better Practice.' It nevertheless took a long time before new contributions were submitted, and it was a very difficult process. The system owner remembered:

...on our knees we had to beseech people to contribute..

Contributions came slowly, but eventually they came. From April 1997 to December 1998, 368 new Better Practices was registered in the document base.

This number of contributions may not be impressive, but it does indicate some awareness and interest on the part of the contributors. It was, however, far more difficult to make people use the system to search for Better Practices. During 1997 and first half of 1998 hardly anyone used SHARE, and during the second half of 1998 the number of new contributions declined again.

When the developers of SHARE asked, the managers justified their lack of interest in the system with poor quality and irrelevance of the documents in the base. Moreover, they complained about the design of the user interface, which they found difficult to understand and slow to use. It was obvious that something had to be done to save the system.

Phase II: Redesign and reintroduction of a review process

Corporate Management agreed to fund the development of a new version of the system with an improved user interface, and decided also to reintroduce a decentralized review process. The rationale behind this being that a satisfactory quality and relevance of the Better Practices in the document base could only be assured by having a review process. The previous mistake of a centralized reviewing process should be avoided as well. Instead of selecting a central review-committee, 30 moderators were appointed to review the suggestions. These moderators were specialists in different business domains, and, more important perhaps, "out there" in the organization, near to the users of the system. A moderator had to have good specialist knowledge to evaluate the quality and relevance of each contribution and a well-established social network. In addition, they also had to enjoy general esteem in the business unit. A moderator was expected to

review Better Practices coming from her own business unit, or from within her field of expertise. Each moderator had the authority to define the criteria he or she wanted to use in the evaluation of the contributions, and also to establish the quality level she wanted to target. Corporate management hoped that this procedure would simultaneously ensure sufficient local anchoring to encourage people to contribute, and sufficient trustworthiness to make people interested in reading the Better Practices in the base.

The SHARE system owner said that:

We decided to delegate the ownership of the system, and I believe that people will appreciate that those who now take on the responsibility to clean up and reorganize the document base are not member of an exalted committee with black caps and tassels on the brow, but someone they know, their own colleagues. If people accept the procedure they'll very likely use the system.

The IT department in Beta and a consultancy, software company developed the new version of SHARE. The interface was carefully overhauled and given a neat graphical design making it much easer to use. Users carefully tested the system, and it proved to work very well.

The new version of SHARE and the new review-process were introduced in November 1998, accompanied by a new campaign to promote using the system. The result was, despite all good intentions, extremely disappointing. It was generally agreed that SHARE had improved markedly, and that the new interface was very satisfactory. The moderators were well received, and the review-procedure was broadly accepted. It had been difficult to find the moderators, though, because many of the possible candidates were fully booked already. The real problem, however, was that too few people used the system, and that the flow of contributions steadily dried up during the spring 1999. Within the first 5 months of 1999, only 21 new Better Practices were submitted, as compared with 368 contributions from April 1997 to December 1998. A moderator meeting was held in June 1999 to evaluate SHARE, and the conclusion from the meeting was that "the SHARE document base does not contribute significantly to sharing of Knowledge in Beta". There was a discernible irresolution on how to improve the situation. Corporate management decided a few months later – in connection with a major reorganization of the company – to give up SHARE,.

4. Discussion

4.1 The idea behind SHARE

The majority of middle managers were initially employed as highly skilled chemists, biologists, physicians, etc., but often with only little managerial experience. When appointed as managers, they became responsible for planning, budgeting and staffing, and they were educated in these activities. The empowerment of middle managers, however, that was an essential part of The New Way of Management, assigned many new management tasks to these people. The documents of the management reform describe these responsibilities as "alignment", "change management", "knowledge management", "empowerment of employees", "career management in a flat organization", "support of cross-unit working relationship". This kind of activities are often called leadership, and J. Kotter among others describe leadership and management as two distinctive and complementary systems of action (Kotter 2002b). The form of management that Beta Corporation wanted to create was dependent on the existence of a large group of middle

managers, trained in science and proficient managers and leaders. The New Way of Management focus of course a lot on this group, and the Facilitators and the SHARE system were primarily initiatives to support the training of these people. The 10 Fundamentals were the guidelines for the training, and the Fundamentals described management as well as leadership activities. The Facilitators should help managers implementing the Fundamentals, and the SHARE system should facilitate the sharing of successful implementation of the Fundamentals among the managers. The SHARE system was therefore structured in the same way as the Fundamentals. Each submitted better practice should relate to one of the Fundamentals and help others within implementing this Fundamental across distance, departments and functions.

The consequence of relying so much on the SHARE system is that the company must develop the system on the assumption that this rather heterogeneous group of middle managers has a common language and a common frame of reference to make it possible and feasible for them to share knowledge. SHARE was hinged on the idea that middle managers were or could become such a group if they were given the right facilities to support communication and knowledge sharing. SHARE was built upon two basic assumptions. First, that the company's middle managers have a shared knowledge and essentially perform the same kind of work, and therefore deal with the same kind of problems. Second, that this shared knowledge and experience will enable them to communicate relatively directly without necessarily knowing each other personally.

4.2   Reasons for SHARE's lack of success

In our study, we tried through meetings and interviews to find explanations for SHARE's lack of clout. After the shortcomings of the first version were overcome, facilitators, moderators and managers generally believed that the real issue was the *content* in the document base – that people did not search the base for inspiration and knowledge, because they found the contributions to be without relevance to their particular situation, or because the quality was simply too low. Without readers, the contributors eventually gave up the system.

Almost all our respondents maintain that after having looked into the base a few times without finding anything of interest, they dropped the system by simply ignoring it as a source of information and knowledge. A research unit manager referred, for instance, to the low quality as the main reason that neither he nor his nearest colleagues would spend any time on SHARE:

> *...it [SHARE] has the gigantic weakness, that it is not any better than peoples' contributions.*

Our respondents gave a variety of different reasons for why people did not use the system, and for the low quality and irrelevance of the Better Practices. There are, however, four recurring explanations in almost all of our interviews and conversations.

Pressure of time

The workload in Beta is high and it takes time to prepare a document for SHARE. New procedures and ways of handling issues are constantly evolving, but are often not put down in writing. It is most often an extensive piece of work to describe new procedures or methods, and if contributing to SHARE is the only purpose, it is often not done. A unit manager in basic research emphasized that:

...it is all something extra, something at the top of the normal run of things. It takes a lot of effort to write to be understood by others.

He added that his department already had a heavy "burden of communication", because part of their job is to prepare large quantities of internal reports for different purposes.

A moderator confirmed that lack of time is a major problem, for the moderators as well. He stressed, however, that time pressure alone is not a sufficient explanation of the lack of contribution to SHARE. Priorities are equally as important. A heavy workload requires a rigorous order of priority, and if a job is considered to be less important, then it will not be done:

People are usually working hard in this company. We have a normal agenda of about 150% of what is possible to do in one day for most people. But tasks are done in this company if it is possible to create a feeling that it is something of value, and important for other people – and people do not see SHARE as important. SHARE is something you seldom find time for, because it is not perceived as a vital mode of problem solving.

Incentives

Several respondents referred to the heavy workload in arguing that some kind of incentives was required if more people were to spend time contributing to the SHARE base, or to revise their documents so as to improve the quality and relevance. A director said:

I believe it is necessary to let people have some token of appreciation for good offerings. A contribution to SHARE does not give any immediate benefit to those who prepare it, and it often takes several hours to write a document that is good enough to be put in the system. A review statement and a small acknowledgment (e.g. £100) will give those people who have a Better Practice accepted a feather in their cap. Such an arrangement will lift the whole SHARE system to a far more conspicuous level, and I believe it will improve the quality of the contributions.

In recent studies on Knowledge Management the idea of incentives is usually associated with "knowledge hoarding", and is often considered to be a significant problem in organizations (Davenport and Prusak 1998). There is, however, no indication in our study that hoarding is a problem in Beta. On the contrary, all respondents emphasize "there is a great willingness to help each other in Beta", and that most people like the idea of sharing better practices. The first Fundamental is widely accepted, and a department manager expressed this general attitude when saying:

...if you have a specific problem and ask: "you have worked on something similar, how would you handle this situation?" then all in this company, with a few exceptions, are willing to do a lot to help

Corporate management rejected the idea of incentives from the very onset. They maintained that SHARE should be a self-contained platform for sharing of knowledge and experience, and that incentives should definitely not be used to keep the system afloat. The argument being that incentives may help to keep the system alive, but they do not necessarily contribute to knowledge sharing. (Scarbrough, Swan, and Preston 1999) summarize this viewpoint in emphasizing that the reward itself may lead to an overemphasis on the rewarded behavior at the detriment of the task at hand. This is particularly important in rewarding knowledge, since what is rewarded almost invariably is a proxy rather than the real thing.

"Bragging"

Many respondents stressed that "bragging" and letting other people know what a gifted person you are, are not considered as good etiquette. This is one of the reasons why managers refrained from contributing to SHARE. It appears that submitting something for SHARE was considered to be a form of boasting and an inappropriate self-endorsement, first and foremost because SHARE was open to everybody in the company. As one department head explained:

There is a feeling that if you add a Better Practice to SHARE, you do so because you think you can do something better that any other person. Very few people like to give that impression.

A moderator and unit manager thought that many managers actually used SHARE to improve their own profile, and that the whole system therefore got the reputation of being a system for "eager beavers". This status as being a platform for exposing oneself to a larger audience has presumably caused many to have misgivings about adding anything to the system. A manager from marketing stated:

I did once consider preparing a new "agenda-form" for SHARE, but I didn't put it in, because I was doubtful of whether or not it was interesting and new enough to be published for the whole company. Actually I thought it was a pretty good agenda-form I had made – well, but I guess other people could have done the same thing.

Personal networks

All respondents emphasized that better practice sharing happens in personal networks – documents and databases are of minor importance. As a moderator explained:

People like to talk about things they have done. But if they for some reason have to sit down to write about what they have done, it all turns into something strained and confined, and very likely not useful for others.

Personal networks are very prevalent in Beta, and of inestimable importance to the organization. People use a lot of time to establish and maintain these networks, and it is generally considered that corporate management should do as much as it possibly can to encourage and support the development of personal network, in particular those networks that transcend business areas and departments. As one moderator strongly emphasized, knowledge sharing primarily happens in these networks:

The crucial issue is the personal contacts, and the better practice sharing and support, which emerge from the contacts you make during meetings, conferences and over the telephone. If you want to help and support someone, you need to know something about his position to be able to adapt some initiatives to the local circumstances that exists in this specific situation. The Web is probably useful, but only to support what goes on in the personal contacts.

Knowledge sharing based on personal contacts does, however, have its limits in a large organization like Beta. Building and maintaining relationships is very time-consuming, and increasingly difficult to establish as the organization become geographically dispersed. Some of the respondents pointed out that some kind of "yellow page" service was needed to help finding people with a specific knowledge and experience.

5. The difficulties of cross-boarder communication

The four explanations above are all distilled from our interviews and the meetings, in which we participated. They represent the explanations we found in the organization of the unsuccessful implementation of SHARE. They have one thing in common; they focus on the input side, or more accurate on people's reluctance to contribute to the document base, and the explanations are very similar to those found in the recent discussion on knowledge market (Davenport and Prusak 1998). Our study, however, indicates that the non-reading and non-use are at least as important for the history of SHARE as the non-input.

Readers and writers described the contributions very differently. Readers complained about the "localness", modest relevance and the low quality of the contributions, while the contributors talked about how difficult it was to write intelligibly for a broad audience, and that they knew this was required. A moderator criticized the contributors very distinctly for taking the local situation as given and for writing about their work with sympathetic understanding. They should, he argued, reflect more consciously on their target group and try to write in a way that other people would find it meaningful and relevant. He tried once to encourage this new style

...and then we tried to get the work started by writing to people, in particular the people who had written something we thought could be better. We encouraged them to think about what they had written in a more general and process-oriented way, and to consider, if other people should use the stuff, what was then the core message. We got zero response. People properly felt they had contributed enough already...by spending time preparing something at all, I mean.

People, however, who prepared something for SHARE, were well aware of the fact that they were writing for the managers in the whole organization. They found this to be very difficult, a "pedagogic task" as a unit manager said. Although the contributors presumably did their best, they were not successful in this regard, which appears to be very important for the outcome of SHARE. The interesting question, however, is why do these documents had to be so "general" and "pedagogic"? Why not just succinctly written insider-remarks, well understood by other managers?

The idea for the Eureka system, by comparison, grew form the observation that Xerox' technicians make annotations on their documentation, and the goal was to permit the technicians to share those annotations (Orr 2000). The technicians write the annotations to provide for future tasks, as a serial transfer of knowledge, in which the source person and the receiving person is one and the same (Dixon 2000). Orr argues that when designing the system, they underestimated the difference between writing annotations and writing for others, and that technicians consult with their teammates in time of need before turning to Eureka. Nonetheless, by 2001 Eureka holds about 30.000 records (Brown and Duguid 2000a), and "almost every technician reports that Eureka has been successful" and quite important when it is used (Orr 2000).

Why could SHARE not evolve into something similar? A system that requires effort to maintain, that may not be used frequently, but a system where people sometimes find something very useful.

Our study indicates that the reason is the multifaceted nature of management activities. The New Way of Management assign three very different responsibilities to middle managers, and it seems reasonable to discuss the use of SHARE in relation to each of these management tasks.

Administrative tasks. Living up to the communication requirements is a very time consuming task. Measured by the number of working hours dedicated to the different tasks, the most important management activities are probably the routine functions related to well-established procedures. Such activities are often time-consuming and demanding. A unit manager talked at length about

> *...a huge amount of communication with many internal reports and crisscrossing of news and information*

These routine activities require high productivity and accuracy and a few examples of successful use of SHARE were people's inadvertent discovery of spreadsheets and document formats that proved to be useful. Productivity in routine functions was, however, not the main objective of The New Way of Management, which focused on change management, and at least some of the respondents reported that did not submit a contribution because they thought it was too simple and everyday routine to be interesting.

Leadership. This aspect deals with the goal of a department or unit and with the performance and fulfillment of this goal. This is the focal point of the New Way of Management, and The 10 Fundamentals underscore the need for an ongoing dialog between management and employees, and make clear that the local management is responsible for developing and maintaining an action plan to ensure improvement of the units' business performance and working climate. This is the activity, that is sometimes called "leadership" in the literature (Van De Ven and Grazman 1997), (Kotter 2002a) defined as "a manager of meaning" or as "giving a sharable linguistic formulation to already shared feelings, arising out of shared circumstances" (Weick 1995). The term meaning actually implies that a wider constituency of organizational members is implicated in leadership, because meaning will be the product of how others have interpreted the messages intended by the leader.

The essential point is that the manager becomes intimately involved with the unit and the expertise this unit possesses. To be a manager of meaning requires a very active relationship to "the thought world that evolves in a community of knowing" (Boland Jr. and Tenkasi 1995). A unit manager stated it very precisely:

> *...you always end up realizing that there is a very gradual transition between management issues and technical issues.*

The implication of this observation is that managers share language and experience with the people they manage rather than with other managers. They may of course share some tools and methods, such as "methods for making working climate surveys" or "guidelines for the formation of departmental improvement teams", which were also available at SHARE, but not used. They are like tools for administrative routine tasks in being transferable, but they require more adaptation to be useful, and therefore more investment in time and effort from the user.

Brokering. The third aspect has to do with the cross-unit communication. Managers are responsible for not only their own unit, but also for the progress within a wide area of activities. The New Way of Management requires that managers actively support cross-unit working relationships and projects of relevance to the business. This requires knowledge of the organization, personal networks as well as proficiency in communicating insights to people who have different backgrounds, and who may not be familiar with the expertise of the manager's unit.

This dimension has a very formal part, the production of reports and updating, and it has a personal part, the building of social networks. Both parts contribute to the communication among the communities. Wenger calls this brokering across boundaries between practices (Wenger 1999) i.e. the transfer of some element of one practice into another. As brokers, managers make new connections, enable coordination, and open new possibilities of meaning.

Managers in Beta are well aware of this brokering role. A director put it this way:

...but if you want to do something in this company you use your network, and call people you know and arrange a meeting, and find out who should participate...it may not be the right persons you find that way, but only because you haven't been able to explain what you wanted carefully enough.

Since communication across units and departments does have a formal part, the majority of the contributions in the base, as it looked shortly before it was finally abandoned, were related to that part. The other part, how to build social networks, were represented only in the form of general guidelines.

6. Conclusion

These three dimensions of management are closely-knit and combined define management in Beta. They define managers as deeply involved with their departments, but also as a group of people with shared responsibilities and practices. Our study indicates, that corporate-wide communication among this large group of managers was regarded by the managers as a cross-border communication, which require qualities that a respondent described as "pedagogic", and which Wenger terms "the creation of a discourse" – i.e. the creation of "meaningful statements about the world that can travel across boundaries and combine to form broader discourses" (Wenger 1999). The managers newer felt they owned SHARE, as a system to support their work. Those managers who used SHARE did so as writers rather than readers.

SHARE was based on at top-down approach in the sense that it premised on Beta's strongly shared identity and culture, and was assumed to be a viable vehicle for the interchange of ideas and opinions among managers, regardless of their rank and specialties. As far as SHARE was used at all, it was not used for interchanges of ideas, but rather for exchanges of tools and methods for relieving the burden of routine management work. The senior management did not realize that, and did not allow SHARE to develop in this direction. Our study indicates that as routine workers middle managers did share interests and experience.

Despite the difficulties in implementing the system, senior management stuck to the principle that SHARE was an *open* communication system, designed to facilitate knowledge sharing among *all* managers in Beta. As a result, alternative uses of the system – for instance to support knowledge sharing within a well-defined *subgroup* of managers with common background and interests – were never seriously considered.

Thus, it seems that senior management in Beta overestimated the degree to which managers in Beta constitutes a single, uniform entity – a coherent "community" engaged in a shared practice. As a result, they overlooked the significant variations and divisions within the group of managers created by different local practices – discontinuities that hamper meaningful communication and the flow of knowledge.

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