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The Paradox of Organizing Knowledge

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Abstract
The paradox of organizing knowledge is that organizational initiatives to ameliorate processes of knowledge sharing may evoke adverse effects to such an extent that these initiatives turn against themselves. With the purpose of promoting greater awareness, both in theory and practice, for how this paradox can act out in real life, this article reports on an ethnographic study performed in a distributed, knowledge intensive ICT company. It gives an in-depth account of the introduction of virtual communities in this organization and what happened afterwards. Like most knowledge management actions, virtual communities intend to integrate knowledge that is dispersed throughout the organization. How can it be that such attempts become a major obstacle to their formation?

Keywords: knowledge organization, virtual communities, organizational change, ethnography, social networks, social network analysis

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1. INTRODUCTION

Organizations are distributed knowledge systems because the knowledge to run them can never be collected by a single mind and no one can specify in advance what that knowledge is or need be (Hayek, 1945; Tsoukas, 2005). Viewed as such, they need to take up the challenge of integrating dispersed and differentiated knowledge to achieve coordinated action among organizational members (Grant, 1996; Tenkasi and Boland, 1996). It is this challenge that provides the intellectual basis for *organizing* knowledge.

Many organizations are taking actions to stimulate knowledge generation and sharing. Such organizational change ideas, however, are always interpreted by all the organization's relevant social groups (Bijker *et al*., 1987). The groups involved appropriate them and make them their 'own' to ensure the essence of their own social and cultural ordering (Sahlins, 1999), leading to the co-existence of different meanings around the same change idea (McLaughlin *et al*., 1999). From the change agents' point of view – managers, designers, inventors, technologists and so on –, such alternative appropriations may come as unforeseen and unintended consequences. Reasons for incongruence between intentions and outcomes are that the organizational change discourse and ICT as part of it, hold prescriptive representations of work activities or aim to 'imprint a unified pattern of thought' and behavior (Akrich and Latour, 1992; Suchman, 1995) that may be 'worked around' by other groups in varying degrees and for various purposes (Whyte, 1991). Consequently, every organizational change process is a dynamic interplay of negotiations among design and responses to that design.

The objective of this article is to promote greater awareness, in theory and in practice, for how practices of knowledge sharing evolving in organizations as responses to the introduction of knowledge initiatives can result in outcomes opposite of those intended. It aims at a fuller understanding of the organization challenge addressed in this special issue of the Information Systems Journal. For that, we will first introduce the organizational setting in which our study has taken place, the idea of virtual communities, and the ethnographic research methodology employed. Subsequently, the specifics of the dynamic interplay among the relevant social groups will be described, in this case the negotiation process between the managers and moderators of the virtual communities and the employees as the projected users of this instrument. We will delve into the organizational discourse on virtual communities and show how the introduction of this modern change idea resulted in all kinds of divergences and tensions between the practice espoused and actual practice. Next, the factors and conditions that account for these divergences and tensions will be explored by explicating the deeper structures of the employees' workaround behavior. This deviant behavior will be explained by considering the pressures and inducements imposed on the employees who are bound by formal structures, rules and regulations on the one hand, and on the other hand work around such formal

representations of practice in order to maintain and develop their sense of professional identity. Finally, conclusions are given and avenues for future research indicated.

2. ETHNOGRAPHY

The ethnography was conducted in a large, knowledge intensive Dutch ICT firm, referred to as Dito (an acronym for Dutch ICT organization). Dito has its origins as a public body in that it partly stems from the Dutch state-owned computing center. Founded in 1950, the State Center for Mechanical Administration, as it was called, was concerned with salary administration by means of punch cards. In 1990, the computing center was partly privatized. As a consequence of taking over competitors, Dito no longer only supplied ICT products and services, broadly defined as 'infrastructure management services' and 'application services,' to the government but also to clients in sectors such as industry, banking, insurance, social security and health care. At the time of research, Dito was a highly distributed company employing around 9000 people, who were spread over 15 subsidiaries with about 25 offices scattered over the Netherlands and other countries.

After a few years of experimenting with on-line practices, Dito offered its employees the opportunity to facilitate communities of practice and base these communities on a new groupware technology. Communities of practice are "groups of people informally bound together by shared expertise and passion for a joint enterprise" (Wenger and Snyder, 2000: 139). Groupware is a self-service web tool for coordination, collaboration, and communication through shared access to technological capabilities such as common repositories, discussion forums, and communication facilities (Orlikowski, 1996). Although originally a broad conception of the community idea was used, the attention gradually shifted towards the virtual communities.

As a research team we witnessed the change project from the start and continued our exploratory study for 18 months. In that time 170 virtual communities had come into being in which, in terms of registered usernames, 2742 employees participated. One and a half years after their introduction, therefore, the virtual communities represented about 30 percent of the firm's total population.

To comprehend Dito's community change project 'from within,' we conducted an ethnographic study. Ethnography refers to engagement or immersion through participation, observation, and description (Hammersly and Atkinson, 1983). Six methods for data collection were used: 1) document review, 2) informant, 3) interview, 4) offline participation, 5) on-line participation and content analysis of the virtual encounters in the on-line workspaces, and 6) a social network analysis of the log files kept. Document review provided important background information about Dito, its view on communities and the ICT implemented. The cultivation of 'insiders' – referred to as (key) informants who were all seasoned employees highly involved in the project – acted as a ready source for consultation and

convenient help over the course of the study. During the 18-month research period, around 50 formal interviews in the various locations of the firm were conducted. The interviewees, who were guaranteed strict anonymity, referred to themselves as managers, consultants, project managers, data warehouse architects, sales account managers, and software engineers. For the purpose of this article, these divers ICT professionals were classified into two relevant social groups: management and moderators as well as partaking employees. Additionally data were collected from participation in face-to-face meetings, which allowed for direct and sustained observation of, and interaction with, a broad sample of the actors involved. Last, we applied virtual methods, consisting of a virtual ethnography (Hine, 2000), meaning that data were also drawn from participant observation in and content analysis of the virtual workspaces, and a social network analysis of the log files that were automatically stored and contain about 1.500.000 events. Social network analysis allows the empirical investigation of knowledge transfer between people and groups of people. Hence, it pre-eminently enables the determination of the actual groups people engage in, that is, the empirically observed social networks instead of the prescribed groups (Haythornwaite, 1996).

3. CHANGE AS DISCOURSE

The decision of Dito's management to create communities supported by groupware is in line with the increasing popularity of these ideas in the organizational discourse. Notably, the idea of community radiates a strongly optimistic promise: "community, we feel, is always a good thing" (Bauman, 2001: 1). As Rapport and Overing (2000) point out, "community [is] a concept of always positive evaluation and evocation, whose usage expresses and elicits a socio-cultural grouping and milieu to which people would expect, advocate, or wish to belong."

The optimistic and idealized portrayal of human practice is reflected in what community and groupware supposedly afford to the users. In terms of the affordances (Gibson, 1979) mentioned in literature (Wenger, 1998; Brown and Duguid, 2001; Duane & Finnegan, 2003), virtual communities are predominantly communicated as empowering tools *for* their users who wish to relate to each other on the basis of equality and for the common good of the group anchored in a strong sense of belonging. They would promote bottom-up knowledge transfer and, thus, new or improved ways of organizational learning. Furthermore, communities are presented as informal boundary spanning devices. They are said to enable increased connectivity across formal organizational structures and cultures to multiple information resources, in the form of both people and systems, crossing different time-space distances. This boundary spanning nature of communities includes enforcing horizontal as well as vertical social ties within the organization. People of all hierarchical and functional levels are meant to benefit from each other's knowledge and learning capabilities. In sum, virtual community

would significantly contribute to the organization's ability to innovate and adapt to its changing environment by drawing people together whose knowledge would otherwise be too distributed and, hence, too difficult to access.

Faced with a rapidly deteriorating economy and a need for downsizing, the virtual community idea is not solely interpreted by Dito's management and moderators in terms of the presumed affordances mentioned above. The emphasis is not only put on the ideal of knowledge transfer and learning, but also on efficiency, coordination, and surveillance. Typical examples of additional and deviating meanings attached to virtual community are that they are considered helpful in coordinating documents, activities, and working methods to minimize redundancy, that they can be used to present the firm as a coherent identity to the outside world, or that they can aid in keeping track of projects at clients' sites and in solving the problem of under-utilized consultants (for more details see Dirksen and Huizing, 2006). Moreover, the appropriations of management and moderators indicate that they want to control and monitor the creation and development of the virtual communities, which contradicts the alleged affordance of virtual community being an empowering tool *for* the users. Informative in this regard is the way Dito makes communities accessible to their prospective users. When employees want to start a community, the first step is to fill in a 'Request for community,' a digital form on the firm's intranet. The next step for responsible managers to arrange is an intake conversation with the applicants to assess their intentions. Subsequently, the managers determine what kind of information system would best suit their needs. In case of this being the community tool, the applicants are given the community template. From this application procedure can be said that even though the technicality of the tool does allow for the spontaneous emergence of communities, management does not permit it. Moreover, communities are installed and members assigned by Dito's management on the basis of mere categorical membership. However, for communities to be the organization principle most effective in stewarding learning and innovation, they need a certain degree of informality and autonomy. This recommendation abound in the organizational discourse is nevertheless overruled.

4. APPROPRIATION BY THE EMPLOYEES

Our research data show a diversity of arguments that employees use while making sense of the virtual community idea and the explicit and implicit messages conveyed by Dito's managers and moderators. The extents to which they attach importance to these arguments determine the way they appropriate this change idea and hence how they will use it. Out of these personal responses, which can be any combination of the arguments used, four generalized appropriation patterns emerge: confirmation, socialization, reputation, and negation. These patterns collectively present a different reception of the

virtual community idea than intended by Dito's management and moderators and implied in the idealized representations of both ICT and human practice in the organizational discourse.

Confirmation is the appropriation pattern that resembles the community ideal most closely. In these cases of 'acted inscription' (cf. Akrich and Latour, 1992), virtual workspaces are used to transfer knowledge. We say 'most closely' instead of 'completely,' because content analysis of the virtual spaces illustrates that there is a correlation between the degree of codification of the knowledge shared and the appropriation patterns. The more complex or real the issue at hand, the more rich communication is needed, the more employees seek other channels to satisfy their learning needs. However, for codified knowledge, such as concerning technical expertise, the virtual communities are readily used.

Socialization, in terms of learning to become a member of a professional group, is another response pattern. It refers to the move of the outsider, a novice or newcomer to the group or the organization, becoming an insider (Trice, 1993). Novices and newcomers typically use virtual communities as a 'mirror of knowledge' to assess their level of competence and to find out what knowledge needs to be internalized to become an accepted and full member of the professional group.

Reputation is the pattern whereby the virtual community is employed as a tool for self-marketing. Through this channel, employees profile their professional identity. They present their 'face' (Goffman, 1959) by showing other members of the group and other groups in the firm who they are, what they have done, and what their expertise is. It is not the knowledge itself that is being shared, but information about the person holding that knowledge. The virtual communities are thus interpreted not so much as learning devices, but as one of the tools available to guide the impressions others in the firm and clients form of him (Donath, 1997).

Last, *negation* refers to the intentional or unintentional behavior of employees barely contributing to the formalized and imposed communities, or not at all. We found that this pattern typically concerns the most experienced, knowledgeable, and skilled employees in the different domains of expertise. For them, the communities represent what is already known instead of what is being discovered.

In the next four sections we will provide cumulative layers of explanations for these appropriation and use patterns by increasingly delving deeper into the arguments used, thereby illustrating how the dynamic interplay among Dito's relevant social groups evolved.

5. CONTRADICTING AFFORDANCES

The affordances of ICT in the particular context of Dito provide the first indications of how and why employees form deviant opinions on virtual community. These arguments oppose the view of virtual communities representing an informal, 'disembedded' notion of work (Forsythe, 2001). Instead, because it is mediated by ICT, the virtual space is often perceived as an impersonal, abstracted and decontextualized medium not suited for knowledge sharing. While management envisions efficiency, coordination and surveillance gains, for many employees not meeting face-to-face implies a social deprivation of human interaction at the expense of cooperation. Moreover, the combination of the visibility of the author and the invisibility of the audience when expressing oneself in virtual spaces is mentioned as a reason for not sharing real concerns through this medium. While enhanced visibility may imply an improved mechanism for management control, for employees it may very well entail unappreciated surveillance (Leigh Star and Strauss, 1999).

Another highly appraised feature of modern ICT is the increased connectivity of information resources enabling the wide dissemination of the firm's available knowledge, leading to potential benefits of not having to 'reinvent the wheel again' and information synergies. However, this feature requires the codification and abstraction of the knowledge to be shared, which inevitably means a loss of meaning (Polanyi, 1983). In addition, many employees find 'doing it themselves' a lot less time-consuming due to information overload and the troubles of finding what you need.

The employees furthermore demonstrate how some attributes of ICT are incompatible with Dito's policies and structures, contradicting the spirit of community and the ideal of unfettered social gathering. ICT potentially enables knowledge sharing across formal organizational boundaries, both horizontally and vertically. This potential, however, can be easily frustrated by the politics commonly found in decentralized organizations. As in Dito, the accountability and financial rewards of managers and employees can be grafted upon internal competition between subsidiaries, business units, departments, and individuals. As many employees experience, this internal competition has a major discouraging effect on cooperation in the virtual spaces, as knowledge transfer is not explicitly rewarded. Moreover, in situations where the boundary spanning potential of the medium is exploited, some local managers see this as a sign of diminishing loyalty to their units.

The research data furthermore indicate two opposing views on organizing knowledge within Dito. For management, the value of knowledge increases with the degree of dissemination within the company, which includes their anxiety of employees leaving the firm taking the knowledge with them. For employees, however, sharing knowledge may decrease its value. Hence, many of them hoard knowledge to increase their personal market value or out of fear of individual redundancy (Harrison, 1995), which contradicts the view of the employee as eager to learn and indiscriminately help others.

6. RESISTING CLASSIFICATIONS

Although incited by the confrontation with the material elements of the change idea, additional arguments explaining deviances in the interpretations and behaviors of Dito's employees are found in the classifications of belonging the community idea proposes. When confronted with this idea, employees are prompted to determine what constitutes a community, who belongs, and what it is that makes them a cohesive group. As the term community implies, members should have something in common, but what denotes this commonality? The confrontation with the change idea therefore instigates judgments about professional identity, i.e. "the sense that [professionals] have of themselves as members of a category by virtue of their work" (Forsythe, 2001: 77). These judgments concern the variation in information needs and knowledge claims.

In general, people define themselves vis-à-vis a 'generalized other' (Mead, 1934) – be it the project, the client, the technology or the other members of the community. When asked to explain their relative degree of participation in the communities, many employees see a mismatch with the knowledge posted and attribute this mismatch to a high variation in information needs and rapidly shifting learning foci, resulting in memberships too diversified to be referred to as a cohesive group. Learning behavior is dependent upon the way people enact their roles and tasks (Leckie *et al.*, 1996). This implies that the learning behavior of employees is determined by what they hold key to their jobs: 1) the project(s) they are engaged in, 2) the client(s) they have to satisfy, and 3) the kind(s) of technology they are involved with. Working in Dito is frequently perceived as a series of (often short-term) projects. In addition, professional knowledge in ICT is generally seen as highly transient and susceptible to changes in the lifecycle of systems and the emergence of new technologies, often leading to the need to hyper specialize oneself, even on the level of software brands. Consequently, many employees have a short-term, highly focused and instant gratification view on learning and describe their learning behavior as too dynamic and specific for virtual communities to be cohesive and effective.

Similarly, perceived mismatches with the knowledge posted lead employees to define their 'knowledge claims' (McLaughlin and Webster, 1998), that is, they judge whether their knowledge is of a higher or lower quality than the common knowledge of the group. Some employees in Dito, for instance, attribute their non-posting behavior to feelings of inferiority. In the words of one interviewee: "*It is a kind of modesty. I do not find myself sufficiently knowledgeable to tell others about my expertise and skills.*" In contrast, others explain their non-reading behavior with feelings of superiority: "*I do not think much of the average ICT person; incompetence rules all right.*" Participation in the communities is furthermore related to how members profile themselves, indicating cultural differences as impediments to knowledge sharing: "*In the West [of the Netherlands], when*

you want to profile yourself, you will have to shout: 'Look at all the great things I did'. We [in the North] are more collected, yet easily intimidated."

Next, the division between professionals with and without thorough knowledge of ICT is considered an important factor in explaining participation levels in the virtual communities: *"I am really more a generalist, a person with a helicopter view overlooking things and subsequently pointing out the important relations among the relevant factors. The average Dito employee, however, is at his best when detailed [technical] knowledge is required."*

Connected with this perceived difference between 'generalists' and 'specialists' or between 'techies' and 'socio's' are the judgments made about good selves and bad selves. "'Bad selves' are the kind of person the community cannot tolerate and 'good selves' are the type of person the community must have" (Pfaffenberger, 1999: 153-4). These judgments express what people think should be the norm, in this case what an ICT professional should know in terms of the skills and competences required. Such judgments determine whether or not co-workers are perceived as righteous members of the group, while disagreements on the professional norms can affect people's opinions on group cohesiveness. For instance, some respondents consider technical knowledge as indispensable for ICT professionals: "*One needs a substantial degree of technical baggage, because when technical terms are discussed and you have to admit that you cannot follow the arguments, the client might think 'what do we gain with this person?'"* Others, however, attach fundamentally different meanings to ICT professionals: "*Not having ICT knowledge as a consultant does not necessarily have to hinder you*."

Summarized, instead of confirming communities as harmonious entities, the research data show dichotomies fragmenting the groups and preventing them from functioning as cohesive entities: 1) the elder, established professional versus the novice or less experienced employee, 2) people from region A versus those from region B, 3) the generalists versus the specialists 4) and the techies versus the socio's. These dichotomies are seen as indications that management's decision to impose groups through categorical membership contributes to an artificialization of firm practice in that, as the next sections will further illustrate, the boundaries of the formal groups created do not concur with employees' established and emerging practices of knowledge sharing.

7. OTHER INFORMATION RESOURCES IN ACTION

More arguments explaining employees' appropriation patterns can be found by asking the respondents how they make use of the other 'information resources in action' (Suchman, 1987), in this case: other virtual communities, other digital and non-digital information resources and, most importantly, personal social networks.

As the social network analysis performed on the log file data displays, people simultaneously participate in different virtual groups to enact the various roles assumed as part of organizational life.

The average number of memberships per participant, referred to as connectivity, is 1,8. Some people hold up to 7 or 8 memberships. Representing exemplary outcomes of social network analysis, Figure 1 contains four selected formal communities, two technically oriented and two business oriented: software engineers, object oriented technology, project managers, and consultants. The participants are represented by the dots and the various other virtual groups they are connected with by squares. The closer participants are positioned to the center of the selected group, the more active the members are in that community. Conversely, the more participants approach the squares, the more active they are in the other groups they are connected with. Furthermore, the closer the squares are to the graph's center, the more participants in the group jointly share memberships in other, referral groups. These graphs thus measure the extent of connectivity in terms of strength of ties *and* multiple memberships, showing the internal cohesion or fragmentation of the communities.

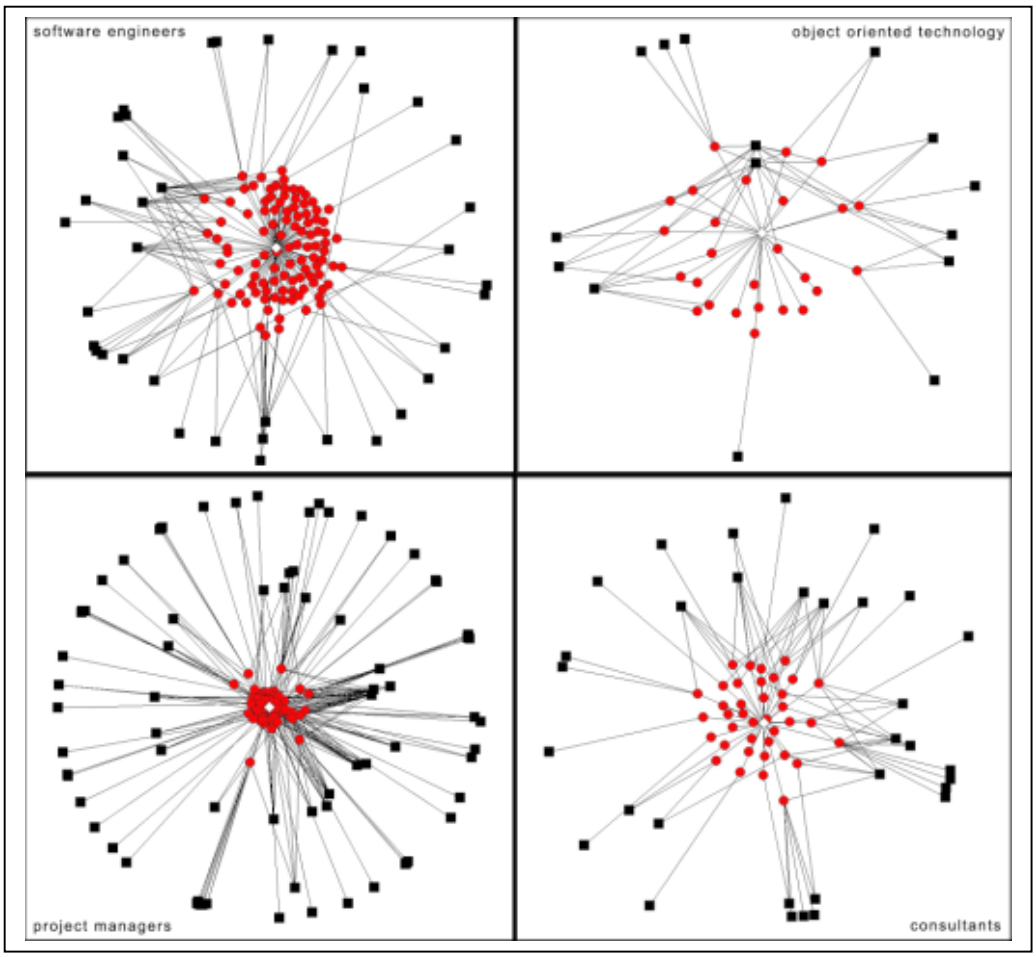

Figure 1 Social network graphs

The graphs demonstrate that the object orientation group features a relatively low internal cohesion, high connectivity and a noticeable high extent of shared memberships in other groups indicating distinguishable referral groups. In contrast, the software engineers combine a relatively high internal cohesion with moderate connectivity and few overlapping memberships in other groups. The consultants score relatively low on internal cohesion, high on connectivity, and low on overlapping membership. Last, the project managers have a relatively cohesive group, are well connected to other groups and the 'inner circle of squares' that is relatively close to the graph's center suggests a high extent of overlapping memberships. As confirmed by content analysis and interviews, the relatively high internal cohesion of the project managers can be explained by their mutual practice in sharing codified and abstracted knowledge such as project plans and standard templates, while their relatively high connectivity originates from the need to be knowledgeable about the large diversity in types of clients and sectors to be served. Project managers typically share project management knowledge with other project managers, and seek other groups for knowledge on joint clients and sectors. On the other hand, for instance consultants have less concrete knowledge to share internally and less overlapping memberships in other groups, thus operate more individually. "Disembedding is (…) fundamental to the organizational structure of consulting" (Amit and Rapport, 2002: 29).

Table 1 **Formal communities versus N3-groups**

		Formal communities	N3-networks
	Size	170	124
Degree of connectivity (in %)	Mean	10,2	98,4
	Std dev	11,5	6,4
	Max	83,4	99,8

Table 1 illustrates the lack of cohesion in the 170 formal communities. By taking 'shared memberships in other groups' as the measure for the degree of connectivity – the so-called N3-networks –, it shows that there are 124 networks of employees that are almost ten times as connected as the formal groups. This is a clear sign of the existence of alternative networks of people operating across the formal boundaries. Comparing the mean and maximum scores additionally leads to the observation that some of the imposed groups are well connected. With a mean score of 10,2 percent, a maximum score of 83,4 percent and a standard deviation of 11,5 percent, however, that does not apply for many groups.

Finally, Figure 2 shows how the creation of formal communities aimed at interrelating distributed knowledge can result in the opposite effect of 'island formation' and 'knowledge disintegration.' We randomly selected one knowledge topic appearing in the log file – 'Architecture' – and subsequently investigated to what extent people sharing an interest in this topic are engaged in knowledge transfer relationships. As the social network graph attests, they do not. While the topic of

'Architecture' is discussed in nine formal groups, there are no links of communication among these groups. These groups act out as knowledge islands that prove to be difficult to access for others.

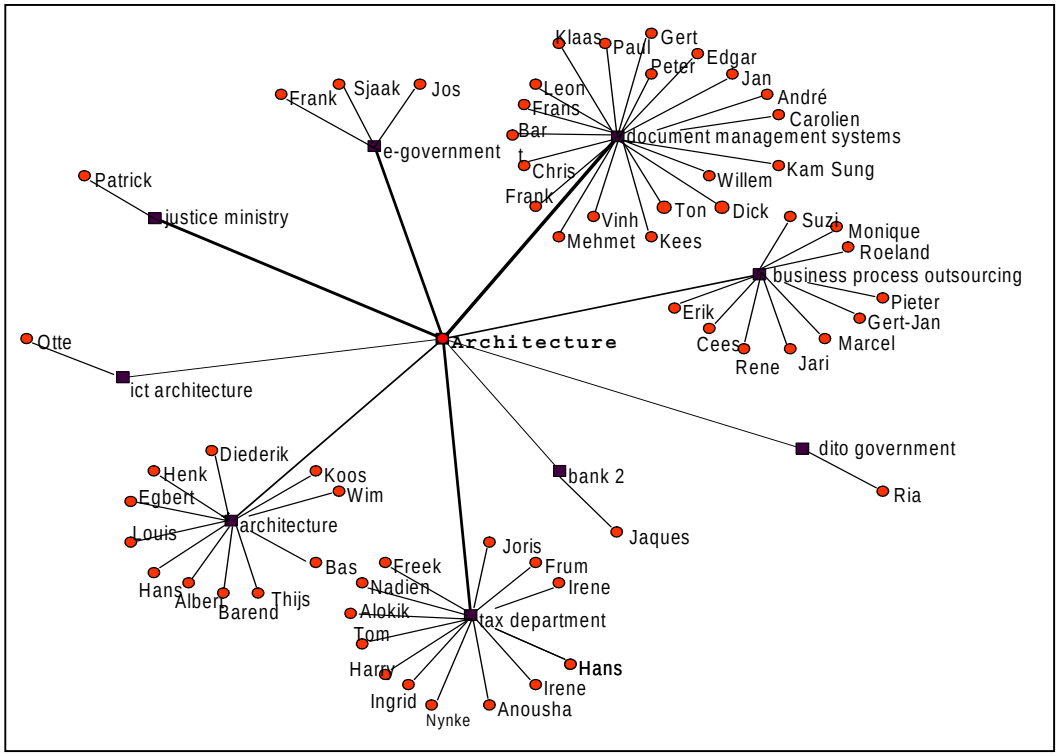

Figure 2 'Island formation'

Social network analysis underlines the observations made in the previous section: many of the imposed communities do not function as expressed in the organizational discourse and only partly reflect management's intentions. In terms of connectivity, multiple memberships, shared memberships in other groups and the impressions given of the *kind* of knowledge members seek in other groups, the quantitative data portray a lack of group cohesion and social fragmentation.

9. ALTERNATIVE NETWORKS OF BELONGING

Subsequently, in search of the actual networks people belong to, alternative information resources drawn upon need to be included. People generally use a multiplicity of formal and informal information resources to be able to do their jobs: journals, books, courses, seminars, internal and external information systems, internet-based newsletters, mailing lists, on-line support groups, and web sites. The virtual communities inevitably have to compete for attention with all these information

resources, a factor contributing to the observed lack of group cohesion because no organization can single-handedly decide on what counts as knowledge in the relevant domains of expertise and because people seek the channels of least resistance.

Talking about alternative information resources points at people's overall reliance on personal social networks. We deliberately speak of *networks* instead of *communities* to underline that they concern the empirically observed rather than the idealized groupings. Personal social networks emerge in the professional sphere yet are inherently social, reflecting that people in organizations are not only drawn together professionally, but also socially. They are ego-based in that "they arise through particular individual's efforts, experiences and history" (Amit and Rapport, 2002: 22) and "extend across different categories and situations" (ibid: p. 23). They refer to a form of relationship that is not necessarily institutionalized and often is structurally ephemeral as opposed to the more enduring social groups such as organizations. "Such networks operate in their own right and on distinctive terms" (Amit and Rapport, 2002: 22). In this section we unravel the arrangement of these networks and the principles by which they are organized.

Personal social networks do not rest on categorical membership. Instead, they draw on people's commitment and identification. Investigation of these factors permits "empirical determination of who – which collective entities or social worlds – are the arena" (Clarke, 1991: 128). In Dito, employees express a variety of objects of commitment. Only few people feel themselves committed to the focal organization or to specific units such as subsidiaries and business units: "*Dito is the firm I happen to work for. This could just as well be a different organization. But on the other hand, I can be said to be quite loyal. After all, I have been working here for the last 16 years!"* Instead, many employees refer to themselves as their major object of commitment: "*That's me. And I do not mean as if I am antisocial or something…"* Some people explicitly mention former colleagues: "*I have strong bonds with former colleagues; the people I used to work with are my chief network.*" References made to other people and structures outside of Dito such as professional associations, clients and competitors are also frequently noticed: "*I do experience a strong commitment with the client. That might be a need to identify myself with something tangible after all. Dito, on the other hand, that's a bridge too far."* It is furthermore noteworthy that although the participants reside in an ICT firm and their everyday work practices revolve around ICT, only very few informants display a special interest in or caring for technology. In fact, most of them express a certain degree of detachment or non-identification with ICT: "*I might just as well be working in a construction firm.*"

As to the main reason to create and maintain personal social relationships, people focus on 'supplementary competences' or 'affinity and personal liking,' which both build on feelings of trust grown upon a shared history of interactions and experiences. Supplementary competences refer to the potential benefits of the relationships: "*[Colleagues] all have their own area of expertise they excel in.*

One is good in dispatches, the other in technical programming. Well, gradually you try to gather all that information and eventually it also becomes your own and that enables you to act more independently." Others, however, emphasize affinity: "*There are only a few meetings I clear my agenda for, and I do so for the project management group. Not so much because I have a relationship with the group, but more so because I feel committed to certain people within the group*." As the research data indicate, 'affinity networks' prevail over 'competence networks.'

Abstracting from the personal remarks mentioned, commitment, aside from mere membership, is a matter of calculated *and* affective identification. Organizing personal networks around the notion of supplementary competences is exemplary for calculated identification. This kind of identification is based upon the broader principle of reciprocity or exchange, that is "a voluntary agreement involving the offer of any sort of present, continuing, or future utility in exchange for utilities of any sort offered in return" (Weber in Woolsey Biggart and Delbridge, 2004: 31). People help others, but expect that, somewhere, somehow, the favor will be returned. The organizing principle of affinity, on the other hand, implies that personal networks are formed and sustained by people liking each other: "*If I have to get around the table with the biggest jerks only because that could be meaningful for my network, I won't do it.*" As opposed to calculated identification involving obligations towards each other, affective identification addresses commitment as people's true engagements and interests (Knorr Cetina and Bruegger, 2002). Depending on personal and situational conditions and on their interactional history (Nardi *et al.*, 2002), people can and do shift their identification balance between calculation and affection.

In sum, the previous sections indicate an overall lack of cohesion in and a consequent lack of identification with the virtual communities prescribed in Dito. After this deconstruction of the groups imposed, this section reconstructs the boundaries of the social networks people actually engage in and identify with. Together, they show that most employees have a different view of practice and professional identity than is presented in the ideal of virtual community as expressed in the organizational discourse and in management's appropriations of this ideal. This observation not only provides explanations for the way employees have appropriated the community idea, it also illustrates that people organize themselves in 'networks of belonging' and engage in informal knowledge transfer and learning practices on the basis of membership, reciprocity, and professional identification.

CONCLUSIONS

Upon implementation, all the social groups involved always take organizational change ideas to their own use (Bijker *et al.*, 1987; Carrier, 1990; Kopytoff, 1996). Our study shows that these appropriations should be looked upon as a combined response to the intertwined discursive, material and institutional elements embodied in change ideas (cf. Rabinow, 1992). That is, appropriations are actively constructed in reaction to the language with which such change ideas are introduced (the discursive element), their affordances (the material element), and the prevailing structure and mores of the social context in which they are applied (the institutional element). Differing appropriations among the relevant social groups cause a dynamic interplay of negotiations evolving around these three elements, the outcome of which is a result of continual mutual adaptation between these groups. While 'consumed,' therefore, change ideas are simultaneously produced.

In this article, we delve deeply into the arguments and motives behind the employees' appropriation patterns to illustrate how practices of knowledge transfer actually evolve as responses to the introduction of virtual community in a distributed organization, which explain the degrees of employees' participation and non-participation in this knowledge initiative. The four appropriation patterns found – confirmation, socialization, reputation, and negation – indicate that people respond to change ideas by comparing the prescribed behavioral norms and essences of professional selves with how they naturally engage in processes of social networking, learning, and professional identity construction. They, for instance, react to the classifications of membership imposed and notice that they do not concur with their common practice of forming groups on the basis of calculative and affective identification and on the basis of membership statuses such as the novice and the elder. To speak with Durkheim, there is no fit between public and private classifications: "If the fit is bad it can be for two reasons: the individual may reject the public classifications and refuse to let them have any hold upon his own judgments; or the individual may accept the worth of the public classifications, but know that he or she is incapable of meeting the expected standards" (Durkheim in Douglas, 1986: 91). Research is needed for the design of systems that converge with these natural processes of knowledge sharing and group formation. Moreover, also because these informal processes may vary across the different informal groups, they tend to remain invisible for management and systems development. How to visualize and appreciate this heterogeneity?

Employees furthermore respond to the prescription of strong social ties with internal colleagues anchored in a bonding sense of belonging, which are deemed necessary to improve the organization's abilities to learn and innovate, and perceive contradictions with the organization's institutional logic that is geared towards internal competition. As a result, the conditions for knowledge hoarding *within* organizational boundaries rather than for knowledge sharing *across* those boundaries are

institutionalized into Dito's accountability and reward system. Additionally, the implied strong ties to learn from co-workers disagree with the nature of work in Dito. Work in this organization is characterized by a high degree of specialization, rapid knowledge development, short-term projects, regular changes due to sequences of mergers and acquisitions, and decreasing job security resulting from disappearing life-time employment - all those features that are common to knowledge work in general. In such situations where flexibility is needed (Beck, 1992), fleeting forms of cooperation and weak social ties prove to be more useful for people than long-term relations, which require a 'certain degree of aloofness' and a 'superficial willingness to cooperate' rather than tight social bonds and behavior departing from values such as loyalty (Sennett, 1998). Granovetter's (1973) observation that 'the force of weak social ties' typifies modern institutional networks is reflected in the case of Dito and its practices of knowledge sharing and information systems use. The flexible nature of work results in many professionals having short-term and highly directed information needs. Consequently, they use the available information systems for instant gratification rather than for deeper and sustained forms of learning. They are so specialized or knowledgeable that they, rightly or wrongly, believe they can only find interesting learning partners in the 'outside world,' and use the internal systems as reputation mechanisms, or not at all. They react to the increased risk of losing their job by shifting their loyalty from their employer to their domains of knowledge and the attendant personal social networks to keep abreast of new developments and maintain their market value, and prefer external above internal information sources. All these reactions question the validity and productivity of traditional knowledge initiatives. Further research is needed to explore the relationships between modern society, the nature of knowledge work, the value of weak or strong social ties, and the functionality of internal knowledge systems when there is so much to gain in the external world.

Last, new and additional internal groups are formed in Dito. As a result of the meanings of collectivity and sameness community thinking carries, however, such groups promote distinctions between 'us' and 'them,' as they attract those who want to belong and exclude others (Rapport and Overing, 2000). Moreover, since "modern expertise is generally oriented towards continual internal improvement or effectiveness" (Giddens, 1991: 30/31), islands of expertise arise that convey closedness rather than openness. In these cases as well, seeking connections across the formal boundaries of the organization contributes to social fragmentation that obstructs knowledge transfer. This study therefore warns against top-down interpretations of organizational discourses stripped off their empirical realities (cf. Butler, 2003): 'know thy organization.' Research should be helpful in this regard as well.

All these appropriations of the change idea amount to a fundamental paradox in organizing knowledge in distributed contexts. The pursuit of closer cooperation and greater consensus among committed employees to facilitate knowledge sharing and coordinated action might evoke the adverse effects of

decreased social cohesion and innovativeness (Fernback and Thompson, 1995; Powel *et al*., 1996; Willson, 2000). As Bauman (1991: 251) remarks: "Each attempt at convergence and synthesis leads to new splits and divisions", which turns "the search for community (…) into a major obstacle to its formation." This is precisely what happens at Dito.

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INDEX

The paradox of organizing knowledge

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Abstract: The paradox of organizing knowledge is that organizational initiatives to ameliorate processes of knowledge sharing may evoke adverse effects to such an extent that these initiatives turn against themselves. With the purpose of promoting greater awareness, both in theory and practice, for how this paradox can act out in real life, this article reports on an ethnographic study performed in a distributed, knowledge intensive ICT company. It gives an in-depth account of the introduction of virtual communities in this organization and what happened afterwards. Like most knowledge management actions, virtual communities intend to integrate knowledge that is dispersed throughout the organization. How can it be that such attempts become a major obstacle to their formation?

Key words: knowledge organization, virtual communities, organizational change, ethnography, social networks, social network analysis

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