

Creating Conditions for Participation: Conflicts and Resources in Systems Development

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ABSTRACT

User participation has been recognized as a way of gaining more knowledge about work and improving the quality of the computer application to be designed. Often the problems of user participation have been discussed from the point of view of researchers getting access to the users. Yet user participation should also be seen from the point of view of the conditions of the participation process—that is, how the conditions are set for the users to participate with designers (and managers). Experiences from participatory *design* projects show problems that participatory design *research* needs to deal with. This article suggests that the Scandinavian collective resource projects can help research in this process. However, these projects were carried out under circumstances quite different from those of corporations in the 1990s, and this fact must certainly be considered when investigating the creation of conditions for participation.

The article presents a recent project, AT project, to discuss the concerns and conditions of participatory design projects today. In the AT project, the actors differed from the collective resource projects in that the actors included several different groups of workers as well as management. This caused the

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project to focus on resource acquisition for the whole organization as well as groups within it. Part of the idea was to utilize standard technology; at the same time, the project was to develop and implement overall visions about the use of computer technology in the organization.

Inspired by philosophical approaches to human development, this article reconsiders the resources acquired in such settings and juxtaposes the work of setting up a technical platform for everyday use with the expansive codevelopment of accompanying visions. The article goes on to suggest that new alliances between groups in organizations—with due concern for their diversity of resources, and with constructive use of the conflicts inherent in the organization—can be a way forward in empowering organizations, making room for groups and individuals within them to act.

1. INTRODUCTION

This article deals with user participation in the design of computer applications, also known as *systems development* or *design*. In recent years, user participation has gained widespread acceptance as a way of gaining knowledge about work, and various roles for user participation have made their way into the textbooks (e.g., Greenbaum & Kyng, 1991; Newman & Lamming, 1995; Preece et al., 1994). The main argument for user partici-

pation in these contexts is that the quality of the computer application is improved. Many techniques for participatory design (PD) have been presented at Participatory Design Conference, Human-Computer Interaction, and Computer-Supported Cooperative Work conferences, and PD technically has become a fairly mature discipline. Several authors, though, have questioned, for example, the use of PD in product development, because of problems of identifying and getting access to users (Grudin, 1993) and the users' fundamental interests in participation (Bansler & Kraft, 1992). Beyond these discussions, real-life PD actually happens despite several problems:

- The collective experiences of participation are often only for those directly involved in the project, and only while the process is running. A forum for co-operation between the directly involved participants and their different peer groups or organizations, and continuity/history between projects is often missing.
- The issues of power and resources are in many cases never considered; users are selected to participate without support from peers. They cannot set up their own investigations, and often they cannot even call a meeting with fellow workers during working hours. In the end, management has the power to decide what to do, in which cases the enrolled users are trapped; they are committed to the system and their words are taken to represent "the users," yet they have no support from them.
- Users often spend time in systems development projects without compensation from their normal work load.
- There are often no resources for users to educate themselves as part of a project.

Some of these problems exist because users are not just people. They work in an organization that has and enforces certain structures and (power) relations. They carry out a job together with others, some of whom share their practice and interests. Others may not because they are at a different level in the organizational hierarchy, because they do other kinds of work, and so forth.

From this perspective, the term *user* may be a mistake. However, for lack of a term that covers all the different kinds of workers—who will apply the technology we build—I will utilize the term in this article.

Although it is clear that many of the early PD research projects were carried out under conditions that are far away from the reality of most PD today, they still have something to offer in response to some of the above problems. I present a case in order to discuss such more recent concerns and conditions. This case, the AT project, was a cooperative project between Aarhus University and the local branch of the Danish National

Labour Inspection Service (NLIS). Two purposes of this project were to design a number of computer applications for the branch and to develop a long-term strategy for decentralized systems development and maintenance. The concerns of the AT project are further discussed by being "mirrored" against other ways of understanding participation and development, living in Scandinavia today: the Danish philosopher Grundtvig's thoughts on human growth, and the Finnish developmental work research approach. It is not the purpose of this article to be a guide to PD techniques. Readers interested in the details of these techniques will have to look elsewhere (e.g., Greenbaum & Kyng, 1991).

2. THE EARLY PROJECTS: LEARNING TO RECOGNIZE CONFLICTING INTERESTS, GOALS, AND DIVERSITY OF RESOURCES

In Scandinavia, research projects on user participation in systems development date back to the 1970s. The so-called collective resource approach developed strategies and techniques for workers to influence the design and use of computer applications at the workplace; the Norwegian Iron and Metal Workers Union project took a first move from traditional research to working *with* people, directly changing the role of the union clubs in the project (Ehn & Kyng, 1987).

The Scandinavian projects developed an action research approach, emphasizing the active cooperation between researchers and those being researched, suggesting that researchers need to enter an active commitment with the workers of the organization to help improve their situation. Although the researchers get research results out of this, the people with whom they work are equally entitled to get something out of the project.

The projects also rejected, for example, the traditional use of systems descriptions, pointing out that systems description with users is a process and stressing the collective acquisition of resources and knowledge (Munk-Madsen, 1978). The key issue was building on people's own *experiences*, providing *resources* for them to be able to *act* in their current situation.

The *harmony view* of organizations, according to which conflicts in an organization are regarded as pseudo-conflicts or "problems" dissolved by good analysis and increased communication, was rejected in favor of a view of organizations recognizing fundamental undissolvable conflicts in organizations (Bødker, Christiansen, Ehn, Markussen, Mogensen, & Trigg, 1988; Ehn & Sandberg, 1979).

Education of union representatives is one way that the projects helped enhance *resources for local actions*. The Danish DUE (Democracy, Development & Computers) project (Kyng, 1989; Kyng & Mathiassen, 1982) offered a 1-week course for up to 500 union members per year for

approximately 13 years. A major part of the course consisted of group work to develop and discuss immediate local union actions. Furthermore, the courses dealt with long-term actions, potentials and problems of computer technology, systems development focusing on user participation, the roles of the union movement and technology agreements, and cases from various workplaces.

In the later Utopia project (Bødker, Ehn, Kammergaard, Kyng, & Sundblad, 1987; Ehn, 1988), these experiences were the starting point, and they certainly provided a perspective that underlay the whole project. Yet, when looking back on Utopia, the major practical and theoretical achievements were the experience-based design methods, which were developed through the focus on hands-on experiences and which emphasized the need for technical as well as organizational *alternatives* (Bødker et al., 1987). Furthermore, the Utopia project demonstrated the potentials and the problems of working with one group of workers (printers and typographers) in a world (of newspapers) where other groups (e.g., journalists) as well as management have significant interests.

We may summarize the important focus points from the early Scandinavian projects in the following (see Figure 1). Based on a fundamental understanding of organizations as inherently full of conflicts, they developed a way of thinking about systems development that focused on technological and work-organizational alternatives, where the education of users to participate in systems development was important, as were design methods emphasizing the work experiences of the users. It is exactly these points that are worth holding onto in the present (Scandinavian) society, which has become increasingly more complex and fragmented (Giddens, 1990), and where the role of labor unions has become increasingly less significant. In the 1970s and early 1980s, labor unions were a natural ally in attempts to democratize participation in systems design; however, this is no longer the case, which, in my view, does not justify a total rejection of what the collective resource approach stood for.

3. A THIRD-GENERATION PROJECT

The cooperation project with the local branch of the NLIS, called the AT project (Bødker et al., 1993), belonged to the generation of empirical projects following Utopia. A purpose of the project was to design a number of computer applications for the branch and to develop a long-term strategy for decentralized systems development and maintenance. For researchers, the coupling between technical and organizational issues had priority, and the project was to take its lead from the AT concerning which questions to take up. Nonetheless, researchers had two complementary ambitions: (a) to use prototyping to explore the possibilities for tailoring

Figure 1. Summary of all projects.

	Early projects	Utopia	AT
Purpose	Helping people influence technology in their everyday lives Resources for local action	Helping people influence technology in their everyday lives Possible technical and organizational alternatives	Helping people influence technology in their everyday lives Empowering the organization for local action
Partners	Local unions	Central unions	Managers and workers of the organization
World view	Organizations inherently full of conflicts	Organizations inherently full of conflicts	Organization inherently full of conflicts, which may be used constructively in design Fundamental conflicts cannot be dissolved
Work methods	Traditional design and research Education	Participatory, experience-based Alternatives	Participatory, experience-based Applying and tailoring standard technology 2-level strategy. Microcosm

“advanced” software to local needs, and (b) to try out techniques for describing work situations in ways relevant for prototyping and for general processes of organizational change.

The project emphasized resource acquisition for the participants in a setting different from the earlier projects: first, because management took part as well as employees; second, because we were dealing with an organization that was to live with the technology after the project ended. Thus, the topics of resources, experiences, education, and so forth needed to be rethought in this new setting, and new experiences fed back into our thinking about participation in design. In our initial reinterpretation, inspired from Pape and Thoresen (1987), *resource acquisition* meant to improve the ability of the organization to maintain experiences and to be able to act better in the future with respect to technological change processes. Furthermore, we wanted to think in a more long-term perspective to avoid some of the well-known problems of user participation: What one does in a project is not only for the project, but should place the organization in a position where the experiences can be used, by the organization on its own, further on in time, and in particular with respect to the further development of the technology (tailorability, etc.).

3.1. Activities of the AT Project

In the spring of 1990, the collaboration between the researchers and the NLIS started. Meetings were held with super-users from the local branch and systems developers from central headquarters in Copenhagen. We learned that the organization intended to increase the use of computers at the local branches, and to decentralize obligations concerning current computer systems.

In the fall of 1990, researchers began to participate in meetings of the local computer committee. Researchers accompanied inspectors on daily inspections and observed NLIS work in the office and at meetings. Administrative work was studied primarily through interviews and investigations of files and other materials. During this period, we developed a primarily horizontal prototype for a case-handling system in HyperCard on the Macintosh, with the intention that one day it should be ported to a UNIX-Oracle platform. The primary purpose of this prototype was to explore the integration of the various isolated computer systems in use at the NLIS. We sent out a newsletter to NLIS workers.

In preparation for a seminar, a future workshop (Jungk & Müllert, 1987) was held for all members of the Aarhus office except managers. The seminar itself was held over 3 days with 10 people from the office and six researchers attending. The seminar included an extended organizational game (Ehn & Sjögren, 1991) and work with mock-ups and prototypes (Bødker & Grønbæk, 1991; Ehn & Kyng, 1991) of future technologies. The prototypes were later installed for 2 days at the NLIS office. The further prototyping process was supported by site visits, and meetings with the local technology committee. This led to our writing a technology proposal on behalf of the Aarhus NLIS, which suggested a replacement of main-frame and terminals with personal workstations and a network.

Later, NLIS headquarters reached a decision to buy PCs for the Aarhus branch, and we considered abandoning the project because the opportunity to do prototyping research in the way we wanted seemed to have slipped away. After intense discussions, we decided to continue the project. In particular, we embarked on a consultant-style relationship.

Our discussions during the aforementioned seminar covered changes to the organizational structure at the office. The new organization was to consist of workgroups. In mid-1991, the branch office began to implement the group-based organization.

Upon adoption of the new group organization, we decided to let our project focus on two of the groups, one of which was to receive new PCs.

Our work with the PC group included meetings where we codeveloped ideas from earlier prototypes and mock-ups. We worked most closely with two inspectors and two secretaries. At the same time, we continued the

work of moving our prototypes to the PC platform. Our role as technology consultants during this period included advising on hardware and software purchases. In addition, we argued in favor of a local action plan that covered projected changes in technology and in the organization. At the end of 1991, we presented a draft of such a plan, which included an analysis of the potential for various forms of software like integrated text processing, e-mail, computerized calendars, and project planning. The draft also discussed technology support for the work of inspectors and raised issues in documentation and training.

Following installation of the new PCs and as part of our continuing consulting role, we conducted training sessions for the PC group members to cover Microsoft Windows and WordPerfect (WP) text editing and tailoring. We also sent out the third newsletter, which included short articles on various software- and hardware-related topics.

Later in 1992, we conducted a 2-day seminar for members of the PC group. Like the first one, the agenda included organizational as well as technological issues. We used mock-ups and simulations to explain the essentials of networks and e-mail. We also conducted a "dilemma game" to spark concrete discussion of their current and future work practices (Mogensen, 1994).

Our consulting activity during this period included helping the group customize Windows and WP. They learned, for example, how to write macros to support document creation that followed standard NLIS formats. Meanwhile, we learned that programmers at NLIS headquarters had been laid off as a first step toward an organization-wide move from the old mainframes to networked workstations. This continuing decentralization further supported the argument for a prototype to demonstrate the functional integration of the applied mainframe programs.

3.2. Exploring the Setting of the AT Project

The NLIS is a state institution that inspects and advises companies about health and safety matters. Forty to 50 people from a variety of occupations including secretaries, administrative workers, machinists, engineers, lawyers, and therapists participated in the project from the Aarhus branch of the NLIS.

When the AT project started, most work at the NLIS was done through paper forms, which were circulated and filed in large archives. The NLIS had access to VIRK (Bødker, 1993), a centralized computer system used to record the interaction of NLIS with companies. Visits to worksites as well as correspondence with companies were recorded and extracted. VIRK is a menu-based system that runs on terminals. Nowadays, VIRK

can also be accessed from PCs. NLIS uses PCs, WP, and Windows as a result of the AT project.

In the early days of the project, the inspectors worked rather individually, each focusing on his or her specific set of companies. The work was supported by secretaries who typed and filed. During the project, work underwent change to consist of groups organized according to which companies are to be inspected. What was formerly centralized administrative work was distributed across groups. Secretaries who had worked in a pool were assigned to specific groups. These working groups were granted a certain responsible autonomy regarding execution. Control of work became more and more centralized, within the branch office as well as in the organization in general, and this led to more and more accounting for work in quantitative terms (Markussen, 1993). At the end of the project, work was yet again reorganized by changing the groups, and with the PC technology, secretaries no longer write for the inspectors. The inspectors do all of the writing and most of their information retrieval themselves. Today, all inspectors use portable PCs with docking stations.

Management of the Aarhus branch initially consisted of a manager and two deputy managers, one responsible for inspection and one for administration. At the end of 1991, this changed; a new top-level manager arrived and the deputy manager level disappeared. This led to further organizational changes and a totally different management style.

NLIS follows the lines of the bilateral agreement between Danish employer and employee organizations regarding cooperation and technology. The agreement institutionalizes a cooperation committee, consisting of management representatives and employee/union representatives, who must agree on principal issues and guidelines regarding, for example, vocational training and technology.

With respect to the AT project, the NLIS cooperation committee has been consulted—in particular, regarding the selection of participants for various activities—but it otherwise has remained rather passive. We have worked with local management as well as employees, mainly those who were most interested in technology or in the change process. Some of the working groups at NLIS had the opportunity to choose to work with us. These working groups were in many ways rather autonomous, and technology issues, as well as their own organization of work, were a natural part of their collective endeavor.

Resources such as time needed to be negotiated with management as well as with the cooperation committee. Actually, our rather informal way of setting up the project organization has been a problem in this respect. Sometimes the working groups themselves have taken on the duty of negotiating resources for their participation with management. Other times, we have done so. On some occasions we have been asked by the

employees to act as their advocates towards management and the central office of NLIS. In other cases, management has asked us to act as their consultants. We have found it important to enter all these roles, as long as what happened was known and transparent to everybody. We believe that this is possible only to the extent that we were trusted by all parties, and because we have quite carefully analyzed the potential conflicts in the situations. Yet when NLIS got a new management, we experienced a backlash where a more clear-cut definition of roles and interests would have been preferred because obviously a new manager coming from outside did not share the trust and experiences with an "outside" project already in place.

Thinking about the participants in this project differs from the earlier ones, which were centered around negotiations between the management on the one hand and the workers' collective (i.e., the local unions) on the other. The present situation does not lend itself to such an easily identified conflict. Thus, whereas the earlier projects focused strongly on acquisition of resources for local unions to work with, and acting upon questions regarding technology to prepare themselves for negotiations with management (Ehn & Sandberg, 1979), the resource acquisition was framed differently in the AT project. We have found it important to look at the individual level as well as various collective ones, including, for example, the group of secretaries, the work branch groups, and the organization as such.

In the earlier one-party, projects the problem to be fought was that of rude exploitation, personified by management. The situation at NLIS, however, was much more vague:

- The quality debate had strongly influenced management as well as workers; however, management still had a strong interest in rationalization.
- Inspection work is not as readily taylorized as traditional industrial work. This was recognized by all parties, including the management, and part of the debate in NLIS circles moved in the direction of more holistic work tasks (where, e.g., inspectors write up letters themselves and secretaries do casework).
- We were not really dealing with a workers' collective united in its resistance against a shared enemy (management; Lysgaard, 1976), such as what was assumed when working with local unions in the earlier projects. Rather, the problems and possibilities are strongly individualized, and the "enemy" internalized in the individual workers. This enemy can to a large extent be characterized as "those things spoiling quality."

3.3. Conflicts As Conditions for Participation in Design

Within the organization there are numerous conflicts that constitute part of the constraints and possibilities for design. Furthermore, as pointed out by, for example, Borum and Enderud (1981), the design process as such creates new conflicts, because it opens new possibilities and "threatens" existing structures, procedures, and so forth.

Bødker (1993) concluded that "It is no coincidence that the secretaries and inspectors are the ones who ask for computer support that can be characterized as media or tools, whereas what management has asked for in VIRK is a system. Clashes between these views are seen throughout the use of VIRK" (p. 8). This example furthermore addresses the more overall issue of the purpose of labor inspection: Is it to make as many claims to companies as possible, or to create more long-term cooperation with the companies to improve working conditions? This, in turn, addresses the conflict between efficiency of inspection (very much a concern of management) and quality of inspection (a concern for most inspectors).

In the case study, we also have been concerned with conflicts between the organization of work on one hand and the quality of the product on the other; before the advent of PCs the secretaries did most of the typing and therefore finalizing of letters. With the PCs, this job was left to the inspectors, partly with the argument of double work. And certainly spell checking and standard formats have made life without secretaries possible. What may be of most concern is that inspectors are cataloguing and filing material as well, whereas earlier this was left in the hands of a handful of secretaries. Each inspector does his filing less frequently and less cooperatively (and of course, the secretaries would claim, less carefully). What is at risk here are really the long-term possibilities of retrieving the material once it is filed.

Regarding new conflicts introduced through the research and design project, the most important one has to do with the attention given to the core PC group members who were selected to work with us. They all got PCs and attention from researchers and management, they got various chances to go away for workshops, and so forth. For many NLIS workers, this group was from the outset very strong, and this perception was enforced in the process; this made it even more necessary to work with other groups as well, and to be very open with respect to what happened in the PC group.

Furthermore, the possibility for inspectors to write their own letters particularly introduced conflicts with the group of secretaries. Because of a profound worry from most of the secretaries, as individuals, of losing their jobs, this conflict has mainly surfaced as individual frustration, not as collective action.

We have been part of the last kind of conflict: as researchers we have primarily been working with those groups and individuals who have chosen to work with us. Also, we have often ended up, for example, doing prototyping with those who were interested rather than with a broad spectrum of workers. Partly this is because of our own blindness and partly it is because we have found it hard to turn down those who volunteer. Underlying this, we have chosen to work with people as equal participants. However, they also have a relationship with one another outside our project, and sometimes these roles have been somewhat conflicting.

4. WORKING WITH PARTICIPATORY DESIGN IN THE AT PROJECT

The work methods and history of the AT project are outlined in Section 3 and described in further detail elsewhere (e.g., Bødker, 1993; Bødker et al., 1993; Mogensen, 1994). Here I present a couple of examples to illustrate the changes in conditions and concerns of the AT project, as compared to the earlier Scandinavian ones.

4.1. Working With Both Managers and Ordinary Users

After some initial fieldwork we decided to hold a seminar with people from NLIS. In preparation for this, we held a future workshop, a structured brainstorming activity meant to emphasize critique, fantasy and realization in three phases (Jungk & Müllert, 1987). Most of the employees participated in this half-day workshop, held during their monthly staff meeting. The management agreed not to participate. This decision was not based on mistrust between management and the designers; rather, our experience had been that future workshop participants are reluctant to criticize when the management participates, and hence ideas for improvement sometimes get lost. The management found this to be a valid argument for not participating.

The main seminar was held over 3 days with 10 participants from the NLIS. They were selected among the different groups of employees as well as managers. The seminar included an extended organizational game and work with mock-ups and prototypes. Compared to the future workshop, the idea was to make the seminar more structured and focused (though on a number of topics), and we had a number of discussions about the role of management in the seminar. We decided that the topics were so clear that it was possible to let the participants confront their opinions with one another. Also, the managers were not to be in a different position than the rest—that is, the managers were not given special time, and they had to take part in the organizational game in the same way as the rest. Through-

out these activities we were highly dependent on the management's acceptance of the roles that we asked from them their judgment that our suggestions made sense, and their ability to step aside and be part of democratic situations.

4.2. Being Visionary With Standard Technology

NLIS headquarters decided to buy PCs for the Aarhus branch as a first step toward new technology for the entire organization. This moved the project direction from our research goals to the practical necessities of helping NLIS in their current situation. The relationship between the NLIS branch office and the computing department in Copenhagen was such that the branch could not expect much real help. It was important for us as researchers to help establish a sound technological platform that would live on despite the resistance from outside. The actual negotiations with the directorate were all along handled by the NLIS.

At the same time, the branch office reorganized to work in groups of inspectors and secretaries. The researchers saw this as an opportunity to start a more systematic effort of introducing the PCs in the organization, instead of just spreading what was available in the organization at random. After negotiations, one group was selected to become users of the first PCs. The idea was that the experiences from this PC group (as well as technical and organizational solutions encountered in the group) should later expand to the rest of the organization, and we decided to focus our project on two of the groups. One would receive new PCs, and the other would focus on developing its use of existing mainframe-based technology.

Our consulting activity during this period included helping to customize Windows and WP and educating users of WP. In our work we centered the activities around work in peer groups, thus making the participants aware that they can get help from the "experts" among themselves.

A two-level strategy was developed (Bødker & Mogensen, in preparation). At one level, a technical and educational minimal platform was established. It consisted of a few programs for the most-needed things, such as text processing. The users were taught how to use these programs, and slowly they began to work with them. Immediate organizational problems and changes were discussed. Small, consolidated steps of change were continuously implemented to improve the immediate situation. At the same time, through continued prototyping, we kept exploring more overarching visions and concerns. Though we were not entirely sure where we were heading, it did not seem as a very good idea to hold back on using the PCs until we were sure. Thus, we aimed for a strategy that would deliberately make use of the fact that we had the PCs at hand.

In this case, we were not too pleased with the choice of basic technology made for us, the PC world, because our own experience was mainly with Macintoshes, and because we knew that it was possible to build Macintosh prototypes that would integrate with the existing computer platform at NLIS. At the same time, there are so many good standard products available (e.g., for office work) that it seemed inappropriate to start a design process from scratch. Furthermore, we believe that doing systems design in an organization composed of a total computer novices soon will become a rare exception, which will make it necessary to develop design strategies where the present computer use (experiences as well as software and hardware) constitutes the basis for the further change.

4.3. Resources for the Whole Organization As Well As Groups Within It

Though our goal was to work with the whole organization, it is most certainly not possible to work with everybody all the time and, as just outlined, it is not necessarily what one wants. The challenge to keep the rest of the organization informed about what happened in the project was undertaken in various ways:

- After cooperative prototyping at the first seminar, the prototype was placed for a couple of days at the NLIS, to encourage interest and discussion among the people who were not directly participating in the seminar.
- Throughout the process we published a newsletter to everybody in the branch office, in which we (and some of the participants) presented experiences in order to have a continuous dialog between the direct participants and the rest of the organization.
- The project was discussed at the regular staff meetings. Time, however, is the ultimate factor with respect to how much involvement of the whole organization is enough. The cooperation committee and the unions were, after some initial interest in the setup of the project, rather passive, though individuals from management as well as labor side were active in the project.

4.4. Situation at the End of the Project

How did the project help resource acquisition for the organization—or groups in the organization—once the designers/researchers pulled out? This topic is not often dealt with in literature; thus, we cannot easily compare our experiences with those of other projects. Furthermore, it is a difficult topic because a successful pull-out is hardly visible, except perhaps in retrospect for the researchers. For the organization, the more the

work methods of the project have become a part of the everyday life, and the less they “miss” the researchers, the better.

At the technical level we have been successful in many ways. The continued design is primarily carried out by two inspectors (who have official tailor roles in the organization) and a temporary programmer, who is in charge of the network and such (Trigg & Bødker, 1994). Initially, standards developed and spread rather anarchistically. Now the procedure has become more systematic; the programmer and the tailors pick up ideas and make standards. Every once in a while, these standards are collected and set up on all machines.

The NLIS people are very proud of what they call the “NLIS approach to WP,” using plenty of (hierarchical) button panels on the screen for various specific tasks. Though this fact was long forgotten, this approach was introduced through the AT project.

Tailors at the NLIS are professionals working in the fields they have chosen and for which they have been trained; at the same time, they are technology “developers”—a new, unfamiliar undertaking. The positive side of this is that the development activity remains fully embedded in a professional work life; the downside, however, is that tailors struggle with the conflicting demands coming from the two worlds.

It is probably not realistic for everybody to achieve the same level of competence and participation regarding technology. This new group of experts (the tailors), though more directly situated in the organization, runs the same risk of being detached from the everyday life and problems of the users, as is often seen in more traditional systems development. Yet they provide better possibilities of including reflexivity (Giddens, 1990) in the use/work processes because, after all, they are working in the organization (as labor inspectors) alongside the rest. It is an important challenge for PD to understand and encourage ways of avoiding a too-widespread disembedding of the tailoring activities from the rest of the organization.

4.5. Researchers and Consultants

Entering a consultant-style relationship is different from what we have normally done; in particular, it makes the research process more contingent on what else happens in the organization. We have found ourselves awaiting what happens more than in earlier projects, where we have had a more active role in shaping what happened. For example, after we helped seed the idea of group work, we awaited the reorganization. After helping the tailors get started, we awaited how they found their own ways and supported them by answering their questions.

At the same time, the contingency meant that we were less able to determine what we considered interesting research questions to pursue

than we would have been without the commitment to take the actual problems of the organization seriously. The same applies for the research and design methods. When we started, we wanted to try out certain research and design methods, some of which were abandoned later because there was no need for them. At the same time, this forced us to try out other methods that we did not initially intend to use.

Looking at the research we have done, however, these new questions and methods proved no less interesting than the original ones. On the contrary, we can see the activities of the project as taking user participation at face value.

5. REINTERPRETING CONCERNS FROM THE PROJECT

In the following, I shall seek inspiration for reinterpretation and expansion of the concerns of the AT project from two (at the surface) rather different, sources: a Danish clergyman of 200 years ago and a Finnish psychologist of our own time. My reason for picking these two sources is that, in my view, they represent two highly viable alternative ways of thinking about human development at a collective as well as an individual level.

5.1. Growing

The Danish clergyman, educationalist, and philosopher Nikolaj Frederik Severin Grundtvig (1783–1872) thoroughly reformed the Scandinavian educational system, and his ways of thinking still live in many areas of Danish society. Grundtvig believed that human beings were put in this world to *grow*. A grim and pitiful life on earth is not, he believed, a precondition for a next life in heaven. On the contrary, we have every reason to make life on earth better for everybody collectively (Larsen, 1974). Grundtvig suggested the use of common-sense language in the person's mother tongue in reciprocal teaching, founding learning in the everyday life experience of the learners. He organized high schools for young peasants to educate themselves in historical and cultural matters. As opposed to the normal schools, the idea was for them to come of their own choice (as adults), meet the "spoken word" (i.e., experience and discuss with culturally important persons and events) instead of reading rather detachedly about culture, and have their education rooted in their own experiences and history. In Grundtvig's thinking, such education was a prerequisite for coping with growth, as well as for wanting it for oneself. Because systems development is a situation of growth, per se, "threatening" our safe, everyday being in the world (Brun, n.d.), many of Grundtvig's thoughts are rather challenging; a general education in mat-

ters around systems development seems to be important to be able to take part. This education must arise out of the users' everyday experiences, and be in dialog with peers and with the educators. These, in turn, must be people who actively embody the culture—in this case computer systems development and use—in a wide sense.

Furthermore, the thoughts of Grundtvig, being as firmly consolidated in Danish culture as they are, may provide a perspective to help understand the role of management of NLIS in the AT project. Grundtvig's anti-elitist perspective on the access to knowledge is, in my mind, quite fundamental in understanding why Danish society and work life is as relatively open as it is.

5.2. Developmental Work Research

Inspired by the sociocultural tradition of activity theory (mainly Vygotsky and Leontjev), the Finnish psychologist and educationalist Yrjö Engeström and others have developed their developmental work research approach. This approach is an action-oriented approach to studying learning and change in work.

Engeström (1987) looked at change processes in organizational settings and saw contradictions of various kinds as the cornerstones of such change. For instance, the artifacts that we work with are under a constant reconstruction, due to conflicts in the way they are applied. These conflicts occur at a number of levels because of which the reconstruction cycles are different in consequence. Engeström came up with a way of utilizing interrelated yet conflicting activities in the process of change of work. Change is seen as a collective learning process where two principles are fundamental: the application of a methodological cycle and the notion of the zone of proximal development.

The *methodological cycle* is the movement from an analysis of the activity and the surrounding activities to the creation of instruments by which the practitioners can transcend their own praxis—thus creating a vision of the change—to an implementation of a final new instrument into the organization. The idea is that, inasmuch as we try to predict how praxis will change, artifacts are used differently from the original intentions, and new contradictions are always introduced, causing the need for new artifacts to arise.

Engeström (1987) used Vygotsky's notion of a zone of proximal development to understand the lines along which such a learning can take place. Vygotsky's idea is that, apart from a person's present skills and understanding, there is a zone within which the person is capable of learning and is motivated to learn. Vygotsky shared with Grundtvig the view that there is no learning if it does not result in the development of the human being. Engeström strongly emphasized that we must look at the collective level.

In his reformulation, the *zone of proximal development* is the distance or path between what a group can do at present, and what it comes to understand as possible new ways of acting—new ways that transcend some of the problems of the present daily work. Thus, Engeström's ideas and methodology extend those of Grundtvig in dealing with collective growth.

We also get a handle on these collective levels methodologically. Engeström's (1987) framework gives some help to understand these different roles and interests, and to make use of them in design. How to support the resource acquisition in such a diverse environment is definitely an interesting question with which to proceed.

Virkkunen (1991) gave a presentation of how this methodology was applied in a work development project in the Finnish Labor Inspection. In contrast to our projects, this project did not primarily aim at developing computer support, and where we brought in technology rather immediately in our analysis; the Finnish project went a long way before reaching that point. Whereas in the work development research there is some notion of the best direction to develop work, in systems development there may not exist such a direction, which means that most solutions have their pros and cons; the benefits for some are at the cost of somebody else. It is often not very clear in which direction one is heading, and it is often discussed where new ideas come from. With the preceding methodological cycle, Engeström (1987) offered his suggestion for how groups transcend their own praxis. Expansion, therefore, ought to be essential in systems development where nobody knows the answers in advance.

One aspect where the collective resource tradition, however, stands stronger than work development research is, in my view, when it comes to direct participation in the analysis and design of work. I see no reason, however, why future workshops could not be included in the repertoire of methods applied by developmental work research.

6. ADDING UP THE CONCERNS

Of the concerns of the original collective-resource projects, an awareness toward resources and conflicts still stands. Resources are a matter of what kind of competencies are acquired by (groups in) organizations to be able to take action regarding development and use of computer technology, not only a matter of money. And looking at conflicts means not just those between employers and employees in the traditional sense; the concept is usefully extended as suggested by Engeström (1987). Grundtvig's thoughts about collective growth are useful in dealing with an organizational unit such as the Aarhus branch office of the NLIS. There is still some work to be done to involve, in a satisfactory way, several groups within the organization at the same time. The concept of quality of the

design process is strongly tied to the resource acquisition for these various groups.

Access to tailorable off-the-shelf software becomes more and more widespread. Experiences from NLIS (Bødker & Mogensen, in preparation) enforce the impression that a two-level strategy is necessary, or at least that situated, local problem solving is not sufficient. Within the project we quite successfully worked with both levels, whereas it is questionable whether the top-level concerns also will be dealt with in the future. This may be a problem for a more long-term, expansive development of technology use, for technical problems of consistency, complexity, and so forth.

Our suggestion to start the work with technology in a small group—what Engeström (1987) called a *microcosm*—allowed a real working group to apply technology, thus adding an element of realism to the experiment. Furthermore, it allowed the organization, and the tailors in particular, to gain experiences on a small scale. As just pointed out, it is necessary to launch a process to involve the rest of the organization alongside the project. In the AT project, this process took the form of newsletters and of “public” demonstrations of prototypes, and is definitely a point where we could have done more.

In situations like the NLIS, where much design is a matter of local adaptation of standard technology, a further fundamental question is: how may we “globally” support local PD (i.e., local resource acquisition)? First of all, flexible, tailorable, standard technology is a necessity. This does not do the trick alone, though. It is important to rethink the design process to include structures through which ordinary people at their workplaces can promote their own interests in a more democratic fashion. The decreased interest and apparent importance (e.g., from the point of view of top management) of each systems-development process provide an interesting opportunity for the people who are actually affected by the changes to take part in the design process. How this potential is crystallized into actual influence is, to a large extent, dependent on knowing how to work with these issues. Ironically, this research interest was specifically the focus of the early collective resource approach projects. Experiences from the project are summarized in Figure 1.

In the AT project, we deliberately tried to spread the collective experiences of participation beyond those directly involved in the project through workshops for everybody, access to prototypes, and a newsletter. We worked to make the organization able to maintain its new competence, even after we left the organization, and we have seen that the organization is still heavily influenced by the methodologies we have introduced.

Though we were quite concerned with the issues of power and resources, we occasionally fell into the trap of working with a group of people without much concern for their relationships in the organization.

This may have been more of a problem than we were aware of. We did put a lot on emphasis on education, which was supported by all parties of the organization, including management. Though all parties found this important, at times it was a problem to get the participants' compensation from their normal workload. Perhaps these last observations illustrate more than anything how easily we can all be seduced by a friendly atmosphere until the real power issues show up.

NOTES

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