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# A RETROSPECTIVE LOOK AT PD PROJECTS

**While modern methods for information system development generally accept that users should be involved in some way [15], the form of the involvement differs considerably. Mostly, users are viewed as relatively passive sources of information, and the involvement is regarded as "functional," in the sense that it should yield better system requirements and increased acceptance by users.**

A different tradition in systems development stresses a more active participation by users. The focus of participatory design (PD) is not only the improvement of the information system, but also the empowerment of workers so they can codetermine the development of the information system and of their workplace. Although some researchers in Scandinavia and other European countries have had long experience with these approaches to participatory information systems design, it is only in the last few years that PD has received broader attention. While the settings in which participatory innovations first emerged differ in important ways from settings in other countries [12], many of the fundamental issues are common across settings.

This article contributes to such a historically based understanding of PD by offering a retrospective look at PD projects conducted since the 1970s. While there are by now many reports on PD projects, as well as prescriptive articles that often draw directly on just a few projects for illustration, there are no systematic surveys of these experiences as a whole. To address this shortcoming we revisit a range of projects, to assess how they handled key PD issues and to identify common themes. Our goal is to draw lessons that may guide further research and development of PD.

## Method

As the basis of this study, we chose the PD projects that were reported at conferences sponsored by IFIP Working Group 9.1 (Computers and

Work). There were several reasons for this. WG9.1 has played an important role in bringing together researchers in this field, particularly to the Systems Design For, With, and By Users Conference held in 1982 [4]. Several subsequent conferences also provided forums where participatory initiatives have been reported [7, 9, 20, 21, 23, 24]. These projects span the 1970s and 1980s and reflect many of the most prominent experiments in PD. Altogether reports from 10 countries—Austria, Australia, Canada, Denmark, Finland, Germany (formerly East and West), Italy, Norway, Sweden, and the UK—were presented.

The definition of PD we used to identify the initial sample of projects was intentionally broad. A prominent feature of the projects had to be the intention to involve users as central actors in system development activities. We only studied PD of software systems, and not other projects launched to increase workers' influence on technological change; some of those other projects are discussed in [18].

We thus identified 25 papers reporting on PD projects. All of these accounts of PD experiences essentially represented "snapshots" and do not adequately reflect their nature as ongoing processes. The longitudinal aspect is missing, and since we wanted not only to review the projects as reported, but also to bring the experiences up to date, we wrote to an author of each of the 25 reports asking them to complete a short, open-ended questionnaire. We were interested in learning about the cur-

rent state of the project, factors that contributed to the continuation or decline of the project, most/least successful aspects, as well as more general reflections on their PD experiences. From the 15 responses received, we selected the 10 most substantive reports. These we list in Table 1 and summarize in the next section. These 10 reports cover 16 different PD projects. For convenience and clarity, we identify projects by principal author in each case, recognizing that the correspondence between authors, researchers, papers, and projects is more complex than would appear from this. Quotations or comments based on questionnaire responses we denote by placing [QR] after the author's name. We further sent a draft of this article to each of these individuals and drew from their written comments (indicated with a [DC]) in making revisions.<sup>1</sup>

Our method of constructing the sample of projects has implications for interpreting the results and drawing conclusions. Since hundreds of PD projects have been conducted in the past two decades and largely in non-English-speaking countries, those included in this study do not of course form a statistically representative sample. Nevertheless, they do represent a good sample of studies reported at the IFIP conferences and may therefore be conceived as leading experiments in the development of PD.

<sup>1</sup>We also include some valuable comments from two researchers, G. Bradley and A. Kjær, who responded to our initial questionnaire, but whose projects did not in the end fit our criteria for PD projects.

## Project Overviews

The earliest of the projects were conducted by the Norwegian Computing Centre (NCC) in the 1970s. Vidal Keul worked with three unions to provide them with knowledge about how the use of new information technology could affect their working conditions and how its introduction can affect their interests. An additional aim was to encourage unions to develop and implement their own technology control activities and policies. Kari Thoresen, also at the NCC, carried on this work throughout the 1980s, with a focus on supporting local work groups' design systems attuned to specific local situations. The early projects were conducted in manufacturing (metals and chemicals) and in office work. The later projects were in public administration and in health care. The early projects, especially the Norwegian Iron and Metal Workers Project, inspired many other Scandinavian PD projects, notably the Swedish Demos project (started in 1975) and the Danish DDE project.

Kensing reports on one of three cases carried out within the Development, Democracy, and EDP (DDE, DUE, in Danish) research project. This was a large-scale undertaking conducted in cooperation with the Danish trade unions in the late 1970s through 1981. Its stated objectives were to increase trade union influence over the introduction of information technology and to develop research and education in the field of system work. The case discussed here involved a large Danish multinational manufacturing enterprise.

Claudio Ciborra lead a PD project in two small towns in southern Italy where the aim was to develop an information system for local socioeconomic information to be used in planning activities by the local authorities. Because the local community is a loosely coupled network, much of the information needed was not known by the local authorities but owned by other actors who were only willing to provide information for the system if they saw advantages for themselves. Within the project, participation was used as a tool to negotiate contracts on the provision

of information.

Probably the best known PD project, UTOPIA, was led by Susanne Bödker, Pelle Ehn, Morten Kyng, and several other researchers from institutions in Sweden and Denmark. The project started as a response to the problems encountered in earlier Scandinavian projects, such as the NCC projects, DDE, and Demos. The researchers in these projects had found that existing technologies set limits on the possibilities for workers to influence technological and organizational changes in the workplace. As a consequence they formulated the need for an offensive and long-term technology policy for trade unions [8]. UTOPIA, set up as a research and development project, was a first attempt to influence the actual development of (graphic) technology. Working closely with unions for graphics workers, the overall objective was to "contribute to the development of powerful skill-enhancing tools for graphics workers" [3, p. 254]. Stress was placed on the quality of the work and product, not only in the design of the technology, but also in training, work organization, and human skills.

Peter Mambrey and his colleagues at GMD, a large German research institution, conducted PD research in the mid-1980s. One PD project assisted users in a small school to develop their own local information system. In a second PD project, in a more rigidly bureaucratic setting of local government, a system for providing information of interest to citizens was developed. A major focus in each case was for workers to investigate which particular tasks should be automated.

Gro Bjerknes and Tone Bratteteig, researchers at the University of Oslo, initiated the Florence Project in a Norwegian hospital. The aim of the project was twofold: first, to develop an information system for providing daily information about patients while decreasing the paperwork involved, and second, researchers tried to develop instruments that nurses could use when dealing with computers. Techniques and tools were evaluated in terms of the role they could play in communication, in coopera-

tion and confrontation, and in learning during the development of information systems.

Marja Vehviläinen conducted an investigation of "study circles" in the offices of a large Finnish ministry involving weekly meetings with a group of women office workers. The main goal in the study circles was to build up the knowledge and practice the skills the office women need to develop their work and computer systems supporting it. The members should be able to explain what they really need and what kind of information systems would be most useful.

The Self-Managed Office Automation Project (SMOAP) was conducted at a large Canadian university in late 1987 and early 1988. It was initiated jointly by a faculty computer scientist, Andrew Clement, and the chair of the staff union's Technology and Job Evaluation committee, Ann Zelechow, in response to chronic difficulties experienced by support staff in dealing with microcomputers, primarily for word processing. The aim of the project was to assist academic department secretaries in exercising greater control in the computerization of their work.

The Human Centred Office Systems Project (HCOSP), headed by Eileen Green, Jenny Owen, and Den Pain, involved the close collaboration of managers, clerks, and systems specialists at a major UK city library. From 1987 to 1989, the researchers acted as facilitators for a series of study circles, which helped support the participation of library assistants in a more formal, multiparty Design Team. The central goal was to assist the 395 clerical workers in gaining an effective voice in the specification of a new integrated library system package, based on a careful analysis of existing work processes and skills.

Siv Friis describes two research projects carried out recently in Sweden, in which she attempts to evaluate the use of the PROTEVS (PRO-Totyping for EVolutionary System design) PD methodology. The first case involves the application of the methodology in a local government administration setting. The second case is in a pharmaceutical manufac-

**Table 1. PD Projects**

Researcher (s)	Project	Country	Dates	Reports
1. Keul, Thoresen	Norwegian Computer Centre (NCC)	Norway	1970s and 1980s	[4,17,22,23]
2. Kensing, Jacobsen, Kyng, Mathassen	Development, Democracy and EDP (DDE)	Denmark	late 1970s	[4,7,16]
3. Ciborra, Gasbarri, Maggolini	IS for Local Authorities	Italy	late 1970s	[5]
4. Bødker, Ehn, Kyng, Sundblad	UTOPIA	Sweden Denmark	1981-85	[2,4,8]
5. Mambrey, Opperman, Tepper, Schmidt-Belz	Local Government and School Information System	Germany	1984-86	[4,19]
6. Bjerknes, Bratteteig	Florence	Norway	1984-87	[1,7]
7. Vehviläinen	Study Circles	Finland	1985	[25]
8. Clement, Zelechow	Self-Managed Office Automation Project (SMOAP)	Canada	1986-87	[6,9,24]
9. Green, Owen, Pain	Human Centred Office Systems Project (HCOSP)	UK	1987-89	[9,11]
10. Friis	PROTEVS	Sweden	1989-91	[10,20,24]

**Table 2. Ingredients in PD Projects**

Project:	NCC 1	DDE 2	Loc. Auth. 3	UTOPIA 4	Loc. Govt. Sch'l Inf. 5	Florence 6	Stud. Circles 7	SMOAP 8	HCOSP 9	PROTEVS 10
<b>Prime Ingredients:</b>										
1. Access to relevant information	*	*	*	*	*	*	*	*	*	*
2. Independent voice in decision making	*	*	*	*	*	*	*	*	*	*
3. User-controlled development resources: time, facilities, expertise	*	*	*	*	*	*	*	*	*	*
4. Appropriate development methods: e.g., Prototyping	*	*	*	*	*	*	*	*	*	*
5. Organizational/technical flexibility	*	*	*	*	*	*	*	*	*	*

Legend:

1) NCC 2) DDE 3) Local Authorities 4) UTOPIA 5) Government and School Information System 6) Florence 7) Study Circle 8) SMOAP 9) HCOSP 10) PROTEVS

turing company. A principal focus of the research was to investigate the potential of PD to affect the relationship between users and systems developers.

### General Patterns and Analysis

While these reports share a common theme, they are as striking for their diversity as their commonality. They defy easy categorization in terms of industrial sector, methods used, or scope of action. Kensing provides perhaps the clearest formulation of the basic requirements for participa-

tion that the other projects also, more implicitly, subscribed to: "The employees must have access to relevant information; they must have the possibility for taking an independent position on the problems, and they must in some way participate in the process of decision making" [4, p. 223].

Two more ingredients were important in the various PD projects. One is the availability of appropriate participatory development methods. The other is organizational or technical flexibility—i.e., is there room

for alternative (technical and/or organizational) arrangements? Table 2 shows which of these five ingredients was a prominent issue in the projects. Participation manifested itself in a variety of ways: the creation of technology assessment criteria and guidelines (Kensing, Keul), creation of new organizational forms including support infrastructure (Clement, Green, Vehviläinen), the design of specific computer systems (Bødker, Bjerknes, Mambrey), and the development of participatory techniques (Bødker, Friis).

Within this overall diversity, the projects do share some common characteristics. In almost every case researchers provided the initiative for participatory approaches, and the aim was to support a specific group of participants, not develop a product for wider distribution. The resulting projects were generally small-scale and isolated from other levels of the host and sponsoring organization. Only two projects, UTOPIA and a later NCC project, were intended to develop a marketable product.

There appears to be a general shift in orientation of PD projects over the decade from which these reports are drawn. As Kensing [QR] notes, "While the main focus in the early work was on developing the qualifications of *workers/trade unionists* for the purpose of democratization of working life, and to some extent also on developing alternative technologies from the workers' perspective, lately the main focus has been on methods for PD in an organizational setting involving *users*, systems designers and management."

In part this change may be related to the industrial sectors in which the projects took place. The list of projects shows a shift from PD in manufacturing industry in the 1970s and early 1980s to PD in offices and service industries in the late 1980s. In the earlier projects, the emphasis was on male-dominated crafts in unionized environments. This stands in sharp contrast to the later projects, which focus on settings in which women workers and traditionally female occupations dominate. As a consequence, in the later PD projects, more attention is paid to gender issues than to union issues. This growth of a gender dimension is reflected in the number of female researchers in our sample, which is significantly higher than for information system (IS) development as a whole. The last five projects all had women as principal coresearchers.

### Setting

An important part of a project setting is the industrial relations context in which it operates. Given that participatory approaches to systems de-

velopment began with union initiatives and that many of the projects were conducted in countries with high rates of unionization and codetermination legislation, it is not surprising that unions are very much in evidence? Keul [17], in reviewing three Norwegian cases, remarks on the need to ground the work firmly at the local level for participation in technology assessment projects to have a reasonable hope of success. Similarly, Kjær [QR] observes the need for the project to be "deeply rooted in local activities." The UTOPIA project cooperated closely with both local and central bodies in the Nordic Graphic Workers Union, but partly as a result, was then not able to work with the journalists union. Where present, the local union provided support, occasionally resources, and in one case mobilized a strike.

However, the importance and role of unions are not always clear. Kensing [QR] remarks on the lack of interest shown by the central union office in the results of his work with a local branch of the union. "The project was anchored to the local levels of the trade unions, and we never really succeeded in getting a trustful relation to the central levels of the unions." Thoresen [QR] notes, as one of the least successful aspects of her projects, the "difficulties in engaging the unions in practical work . . . [They generally preferred] to take part in the steering committee only." Green also mentioned the ambivalent and passive approach of the union to the project, mainly because it did not fit with their "traditional" way of representing workers' interests.

The role that the codetermination legislation plays in PD is an interesting one. Created as an enabling mechanism, it is not viewed as anything more than a broad framework within which local strategies have to be devised to address the local situation. The Norwegian Work Environment Act (1977), in particular, is designed to function in this way and provides participatory rights to all employees ("users"), not only unionized ones. It identifies concerns in the area of psychological/social

health while providing advice on how to organize for finding local solutions. Thoresen [DC] notes that this focus on frameworks, not detailed prescriptions "reflects the national work life tradition where local autonomy and problem solving are highly valued." She further observes that participation can function sufficiently smoothly through the local Work Environment committees and that unions sometimes regard it unnecessary to involve themselves directly.

The general lack of commitment of central unions and the variable involvement of the local unions suggest the strong orientation of the early PD project toward the labor movement is at least partly the result of the ideological position of the researchers and some local union officials involved [18]. Kensing, for example, reports "differences in political perspectives" with the central unions [QR].

There are some signs that this "Scandinavian model" of user and union involvement in technical change is becoming weakened. As Bradley [QR] notes, due to recent political changes in Sweden, the approach that developed during the long-term domination of the social democrats is now under very intensive debate. This is manifest in part by the increasing role of management. She sees signs today that concern about the psychosocial work environment, which was primarily initiated by trade unions and their central federations, is "now driven from the employers' side and moreover in a more decentralized way" [QR]. This appears to be part of a growing trend that likely reflects significant ideological shifts in Western Europe generally.

Another salient aspect of the setting of a project is the availability and control of resources—money, space, time, and equipment. As Mambrey notes, a critical objective is to overcome the "asymmetric distribution of resources" as part of the attempt to create the necessary "room for manoeuvre." Funding generally came with the researchers. Friis [QR] describes how technology was available for use but only for the duration

of the project, after which it was removed from the user site. This resulted in the elimination of prototyping from the techniques available to the users. The time that was available for users to participate was also variable: The SMOAP project was able to provide funds to enable participants to hire temporary staff to do their work while they engaged in the Analysis group meetings and other project activities. In contrast, the participants in the Florence, Study Circles, and HCOSP projects were still responsible for their regular duties, although management did agree to allow them to participate during working hours.

### Process

All projects adopted an "action research" approach [14, 26]. This was done in part to address two of the main barriers to effective participation in design—poor access to relevant information and a lack of appreciation for the knowledge employees already had about their own work. As Kensing notes: "It is a widespread opinion among workers that they themselves know nothing about technology, and that the necessary information must be obtained from management. This paralyzes the workers as far as actions are concerned . . . [It] is at least as important to collect and prepare the knowledge of the workers, a knowledge they have obtained through their jobs" [4, p. 232].

Unlike conventional research, which is directed primarily at producing results of interest to those beyond the immediate research site, an essential goal of action research is to achieve practical or political improvements in the participants' lives (e.g., less routine work, greater autonomy, more effective tools). The researcher becomes directly involved in the ongoing work and feeds results back to the participants. According to Thoresen [DC], an important characteristic of action research is, "the alternation between practical work in the field to support the desired changes, and systematic data collection and analysis of the practical work with the aims of improving the action and contribut(ing) to the-

ory building." This constant juggling of disparate roles puts unusual burdens on researchers, especially in light of conventional research norms. However, at this stage in the development of PD, it is likely that action research will remain the most fruitful approach to its understanding and furtherance.

Even within a framework of action research, there is of course no guarantee that the desired participation process will occur. Somewhat ironically, part of the difficulty stems from the key role played by the researcher. Every project was led by one or more of the researchers, and even in the cases where this leadership role was shared jointly with a participant from the user community, it was a challenge to overcome the usual division of labor and to shift initiative to users. Friis reported instances of the researchers, who also acted as technical experts for user prototyping, lapsing into stereotypical system developers' roles. She remarks that "it seemed to be extra difficult to let go of the reins, and leave the development work to the 'coresearchers' (the users)" [20, p. 297]. This reflects deep-rooted patterns of behavior on the part of both systems developers and users. One user in her study expressed the dilemma of expert-led participation with the following remark: "But you don't always listen to us—you do what you think is right for us and the project. And, you are the one who knows; you are the expert; so who are we to dispute your decisions" [20, p. 297]. Bjerknes and Kensing were also concerned about the "passivity" of user participants and their excessive dependence on researchers. As Kensing [QR] observed, "Participation does not mean 'holding hands' all the time."

The projects employed a variety of organizational forms to create a framework for user participation. The basic form was the working group, consisting of researchers and user representatives. Several projects used study circles, a variant on the working group, in which participants come together on a voluntary basis to discuss common concerns. In being able to set their own agenda, share

experiences, and develop mutually supportive relationships away from the pressures of daily work, this organizational form is seen as particularly suitable for encouraging the active participation of women in low-status positions. Vehviläinen used study circles to help 10 office support staff who met regularly to learn from the researcher and one another about computer technology and how to overcome the common problems they faced. The SMOAP project used a similar approach, but with a rotating set of representatives from six secretarial groups involving 25 participants in all. HCOSP researchers also facilitated a series of small, all-women study circles, each consisting of six to eight library assistants. These study circles enabled several of them to become active members of the Design Team and its subcommittees, in which people of different status and specialties decided on such issues as systems specifications, job design, health and safety, and training.

In the Norwegian cases reported by Keul [17] and Mambrey's [19] German School Administration project, researchers set up open forums to facilitate interaction. Steering committees were also established in several cases to handle liaison tasks and conflict resolution. Generally, the reports suggest that participation was an intermittent rather than a continuous process: most of the groups met once every week or two, during regular working hours, in or near the users' workplace. Occasionally teams made visits to other work-sites and held seminars.

Techniques employed by researchers were similarly varied: software prototyping, organizational prototyping, and other forms of practical envisionment; diaries; and work analysis. However, several researchers observed that it was not the particular methods and techniques that were decisive, but a strong political focus on participation, communication, and learning. Mambrey noted that while a wide range of methods were suitable for participation, what was critical to their successful application was effective animation.

Another feature of these projects

is the conspicuous absence of management as a *direct* participant. To be sure, management decisions, often led to the creation of a project to investigate frameworks for enabling technology assessment by workers. Management representatives participated in some of the working groups, and actions were often aimed at management. But their particular contributions or influence on the process is seldom noted. The projects were clearly set up as instruments for workers in their negotiation with management. In the later projects, the role of management seems to become larger. In SMOAP, management got involved following a strike when it agreed to fund the establishment of the Microcomputer Training Program, which it jointly ran with the union. In HCOSP, management was involved from the beginning and provided some essential resources. Managers also acted as leaders and members of the design teams. While top managers and library assistants were generally very positive about the project, some middle managers, however, had difficulty dealing with the unusually democratic practices of the project. They appeared "threatened" by the growing competence and assertiveness of those lower than them, which led to delays and frustrations in the design team [Green QR].

The increasing involvement of management in the later projects might indicate a more general change, for as Bradley noted earlier, the political climate is changing, and management is taking more initiative in this area.

## Results

While there has been no detailed, long-term follow-up to any of the projects, most respondents have maintained at least informal contacts with their former collaborators. They all report that their original findings remain valid and in several cases have been reinforced by subsequent experience. The general conclusion from all these projects is that under appropriate conditions, users are capable of participating actively and effectively in information systems development. A frequently re-

ported result, especially in the technology assessment projects, is the increased consciousness by workers of the social implications of information technology for them—that technology is neither neutral nor value-free. Some projects have led to union educational programs and materials that have been used for years [QR: Ciborra; Kensing; Kjær; Mambrey]. In Kensing's case, the research team contributed to subsequent technology agreements.

Respondents generally note that in various ways the local participants increased their competence on new technology and became more willing to take initiatives around it [QR: Bjerknes; Clement; Friis; Kensing; Mambrey; Thoresen; Vehviläinen]. Kensing notes that in line with project objectives, the local unions "developed their competence on new technology, 1) how it was used in their workplaces, 2) the consequences as to work and 3) their possibilities to influence the use of technology at their workplace." In addition to this improved learning, there are reports of opened communication between workers and management and/or systems personnel [QR: Clement; Friis; Green; Mambrey; Thoresen]. For instance, Friis describes how users moved from their traditional passive roles into analyzing, designing, and evaluating roles. EDP specialists changed from being traditional experts into "teaching and consultative experts." In some cases the users learned to think about work and organization design and exercised a significant influence on workplace organization. However, as Mambrey found, this better understanding of systems and the workplace does not always lead to more positive attitudes toward the technology, as is conventionally assumed. He observed that "participation alone does not further the acceptance of information technology," because the gaps between the goals elaborated by the users and the systems designed by the DP specialists "are not covered up but made [more] visible" [7, p. 356].

In most cases where the creation of a computerized information system was a major focus of the project,

the software continued to be used after it ended. Bjerknes [QR] reports that the Florence project succeeded in building a pilot computer system for nurses' daily work, which operated until the machine crashed the following year. The nurses wanted the system restored, but in spite of considerable pressure from the researchers, the computer vendor failed to fulfill its contract obligations (i.e., getting the machine operational again). Their refusal to respond reflects in part the relatively weak position of the nurses within the hospital hierarchy and the isolation of the project from more senior authorities. Mambrey [QR] was surprised to learn that the software he helped develop is still operating years later, independent of personal continuity. He does note, however, that the user orientation of PD led to a 1:1 copy of existing thoughts into the new system, and is therefore "conservative." Ciborra [QR] also mentioned this potential for conservatism. Thoresen [QR] too was pleased by the unexpected market success of the Case Handling System among town planning departments, while the personnel administration system which she helped one hospital department to develop continues to be in demand by other departments a decade later.

Surprisingly, the most ambitious PD software development project, UTOPIA, did not achieve market success with its state-of-the-art software designed to support skilled graphics workers. Bødker [QR] largely attributes this failure to the small size of the Scandinavian market, only 3% of the American one in this software area, and to a lack of technical competence within the company responsible for developing and marketing the software product. Implementation of UTOPIA (in a Swedish newspaper) was frustrated by opposition from both management and the union of journalists [8]. These problems may be due to the complexity and ambitious scope of the project.

However, the shortcomings of the project should not overshadow its many positive achievements. The project has been widely reported and has had considerable influence on

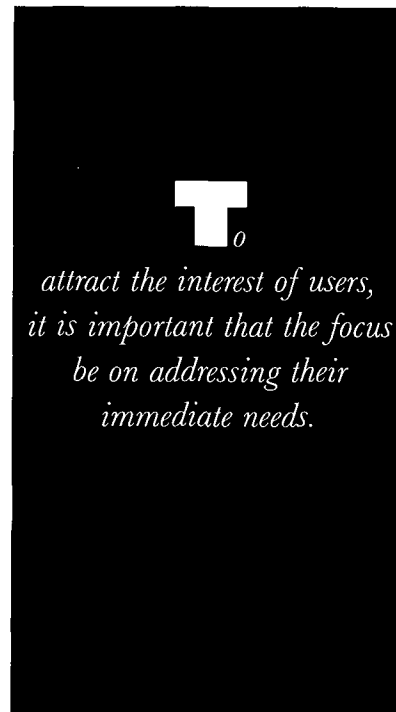
discussions within the labor movement as well as among software researchers. While 10 years ago there was not much interest in the projects' notions about work organization and use of technology, graphics workers unions are "now getting to the point where they are implementing some of the project ideas about how PC's can be applied to alternate production (what has become known as desktop publishing)" [Bödker, QR]. The participation techniques and rationales developed in connection with the project are becoming widely known [2,13].

Although the PD projects reviewed here have justifiable claims to success in a wide range of areas, the actual participatory experiments that spawned these innovations appear to be much more fragile. In cases where projects have not embedded themselves well within their host organizations and where animators have left the scene, the attention to active user involvement has ended. In Friis's [QR] experience, "The traditional work organization was regained [by management] the minute most of the research projects stopped." In the case of the SMOAP project, where a subsequent strike led to the creation of a training program modeled on the demonstration project, the original animator continued to play a vital role in ensuring its survival. The lack of self-sustaining PD activity is of course not entirely surprising given that (1) the projects had an inherent short-term focus and (2) critical resources were withdrawn on their completion. In the Norwegian cases, where longevity was made a primary goal, local PD work did continue after the projects were finished, though sometimes in ways that were not anticipated by the researcher [Thoresen QR]. These experiences suggest that successes according to the usual criteria of PD projects—active involvement of users, increased learning and communications, and more effective, better-adapted systems—can be achieved, but are by themselves not sufficient for local self-sustaining processes of participation to continue. Even the UTOPIA project, which perhaps was the most successful in these areas and

could claim to produce a labor-oriented technological alternative, did not in the end accomplish this feat. As Thoresen [QR] notes, this goal of long-term viability needs to be made a main ambition of PD research.

### Lessons for Future Projects

The projects in our study suggest some guidelines for those who would



initiate self-sustaining PD projects. We have assembled these mainly from the advice of the authors in reflecting on their own experiences with PD.

Two fundamental notions recur throughout the project reports. The first is that PD is a complex process involving technology and multiple levels of organization. The second is that it is highly dependent on specific organizational contexts. For project participants, this means there are no programmatic solutions. Considerable improvisation informed by a holistic understanding of local conditions will always be necessary. Initiators should expect the process to involve juggling many items and balancing competing demands. Bjerknes [QR] further advises that the project should be "fun and interesting!"

It appears that an animator, or a group of animators, with strong ties to the work setting is vital. To attract the interest of users, it is important that the focus be on addressing their immediate needs. The project group is likely to function better in an environment away from everyday pressures so participants can focus on learning from each other, practicing skills, and developing systems. While the relationships within the group may be relatively informal and flexible, protecting it from the outside may require formal contracts and bureaucratic structures, such as steering committees and advisory panels. [QR: Bjerknes, Friis, Mambrey]. Resources such as time, space, relief workers, and access to technology will need to be negotiated, with some control over these residing within the project group itself.

Once underway, an expanding range of techniques, such as evolutionary prototyping and envisionment exercises, become available to help participants design new work practices and supportive computer systems [13, 22]. For the process to become self-sustaining and diffuse within the organization, two distinct developments need to occur. Internal to the group, users must increasingly gain in their ability and willingness to take on the roles of the animator(s). As Thoresen [QR] notes, the goals, plans, and rationales have to be discussed, refined, reaffirmed "again and again, throughout the project, not just at the beginning." At the same time, a wide range of actors outside a group must learn of its achievements and care about its survival. This is perhaps the most difficult challenge, for it requires careful attention to organizational communications and politics. In this regard, Green [QR] notes that in addition to gaining top managerial support, attention must be paid to involving the middle managers who are in direct contact with project activities. This should help the PD initiative become more broadly accepted and more firmly embedded within the organization.

While management must be per-



suaded of the benefits, if they are alone in this view they will be more likely to confine PD to being merely a sophisticated way of "picking" workers' brains and initiative. It is not just competing interests that have to be dealt with, but also the passivity, conservatism, and widespread "social inertia" that Ciborra finds imprisoning both management and workers. His dramatic advice on this is to "smash pre-existing formative contexts; engage in tinkering at all organization levels" [Ciborra QR]. Expect surprises.

Published reports of project case studies are essential for refining PD and broadening its adoption. However, since there is little commonality in the way projects are reported, it is difficult to compare them systematically. It would be particularly helpful if the specific technical and organizational contexts (principal stakeholders, interests pursued, resources available, scope of activity, and so forth) were included explicitly in accounts. Discussion of political considerations and economic outcomes would also be valuable.

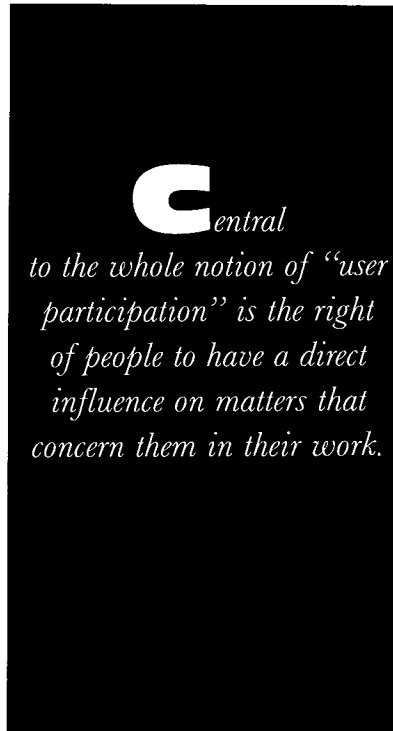
Since most projects have been relatively small, we do not yet have much experience on which to draw for participative approaches to developing large applications, integrating existing systems [Bjerknes QR], or creating technical and organizational infrastructures to support PC-based "end user computing." Furthermore, all reports so far have only looked at participation as a short-term, project-based phenomenon, and not as an ongoing process. While laborious to conduct, longitudinal research that studied diffusion processes after the initial project phase would contribute a great deal to this field [QR: Friis, Vehviläinen].

### Democratization

While an ambition in all these projects has been to further the processes of democratization, the relationship between user participation in systems design and the broader pursuit of workplace democracy is a complex one. As Thoresen [QR] notes: "PD started as a question of information and workers' rights . . . It [later became] an instrument for increasing

productivity. Now the trend is toward realizing and sharing possible gains. It is time to revive the democracy dimension, without losing the productivity and gains aspects. Without democracy, we lose the general dimension, and are left with just a number of local methods for designing IT systems."

Central to the whole notion of "user participation" is the right of



people to have a direct influence on matters that concern them in their work. It cannot be restricted simply to the design of information systems, but inevitably brings in wider elements of working life. If employees are to overcome the passivity and conservatism that we have seen holding back their contributions to the projects reviewed, then such rights must become an established part of everyday work. With the advocacy role of unions weak in North America, and under pressure in Europe, additional approaches to support workplace democratization have to be found. One approach is becoming visible in the later PD projects, where much attention has been paid to the position of women workers and related gender issues. Also, a deeper understanding of the situated work

practices and animation of local initiatives seems a promising place to look. Questions of power and whose interests are being served remain central, but will require a sensitive interpretation of broad democratic ideals in light of the particular opportunities and constraints presented by immediate circumstances.

### Conclusions

The experiences from the projects reported here offer some encouragement and guidance for further development of PD. The basic tenets of PD are seen to work in a variety of settings. Researchers report that users have become better informed about the nature of information technology and more self-confident in taking initiative with it. Several of the computer systems that have resulted appear to function well from the user's perspective and are still in operation. Systems development approaches specifically suited to supporting PD activities are also gaining acceptance. However, PD is still characterized by isolated projects with few signs that it leads to self-sustaining processes within work settings. While in part this reflects short-term project aims, the reasons for this appear mainly to do with organizational inertia and resistance. The main challenge now for PD is to deal effectively with the political and ideological aspects of the broader organizational contexts on which PD initiatives depend for their long-term survival. The dilemma remains that without organizational reform in the direction of greater democratization at all levels, the knowledge and commitment that PD can stimulate in users will ultimately reinforce patterns that limit the growth of their capabilities and thus undermine further initiative. The projects evaluated here suggest that an increased and positive role for management PD would be useful. A careful involvement with management, without abandoning the desirability of an independent perspective, could open up important possibilities for PD. Only by giving participation the meaning of full engagement in vital organizational affairs is the process likely to flourish.



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