

Participatory Design Projects: A Retrospective Look

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Abstract

This paper revisits participatory design (PD) projects that were reported at conferences sponsored by IFIP WG9.1 (Computers and Work) over the past decade. Drawing upon both published accounts and recent questionnaire responses from the researchers involved, it examines the factors that have contributed to the strengths and weaknesses of these leading PD projects. While the central notions of PD appear to have stood up well, for various reasons the projects generally have not led to self-sustaining processes within their host organizations. Suggestions for future projects are offered.

Keywords

Participatory design projects; Case studies; Retrospective analysis.

Introduction

Approaches to information systems development that stress the active participation of users have only in the last few years received much attention in North America. European researchers, particularly in Scandinavia, have had a much longer experience with participatory design (PD). While contemporary North American settings differ in important ways from the settings in which innovations in participation first flowered [Greenbaum, 1992], many of the fundamental issues concerning the nature of participation, roles of various actors, resource requirements, appropriateness of design techniques, etc. are common across settings. Perhaps we can learn from how the early experimenters dealt with these issues and thereby reduce somewhat the tendency to reinvent the wheel?

This paper contributes to such a historically based understanding of PD by offering a retrospective look at participatory design projects reported over the past decade. 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 help 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 derive lessons that may guide further research and development of participatory design.

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. Six subsequent conferences have also provided forums where participatory initiatives have been reported (see Briefs, et al., 1983; Olerup et al. 1985; Docherty et al., 1987; Tijdens et al., 1989; van den Besselaar et al., 1991; Nurminen and Weir, 1991). These projects span the 1980s and reflect many of the most prominent experiments in PD. Altogether reports from 11 countries - Austria, Australia, Canada, Denmark, Finland, Germany (formerly East and West), Italy, Norway, Sweden and the UK were presented. As active members of WG9.1 we also saw this study as a way of furthering the work of the group by assisting the international exchange of research about workplace computerization.

The definition of participatory design 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 thus identified 25 papers reporting on PD

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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 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 current 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 participatory design experiences. From the fifteen responses received, we selected the ten most substantive reports as the basis for detailed investigation. These we list in Table 1 and summarize in the next section. For convenience and clarity in the discussion to follow, we identify projects by the name of a 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 upon questionnaire responses we denote by placing [QR] after the author's name. We further sent a draft of this paper to each of these named individuals and have drawn upon their written comments (indicated with a [DC]) in making revisions.

This 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. In comparing these case studies, we begin a systematic and exploratory assessment of problems and prospects of participatory design. In doing this, we are able to draw on some of the leading experiments in the development of PD, representing a rich body of experience with the central issues in participatory design.

Project Overviews

In this section we briefly describe, in an approximately chronological order, the various projects we draw upon for this study. The earliest of the projects were conducted by the *Norwegian Computing Centre (NCC)* in the late 1970's. 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 1980's, with a focus on supporting local work groups design systems attuned to specific local situations.

Gunilla Bradley conducted a study of the working environment related to computer use in the offices of a Swedish insurance firm. An important focus of the research was to investigate the potentially adverse health implications of computerization and explore ways in which

	Researcher(s)	Project	Country	Dates	Principal reports
1.	Keul, Thoresen	Norwegian Computing Centre (NCC)	Norway	late 1970 s	Keul, 1983; Pape & Thoresen, 1987, 1992; Thoresen, 1989, 1992
2.	Bradley	Work Environment Development,	Sweden	late 1970's	Bradley, 1985, 1989
3.	Kensing, Jacobsen, Kyng, Mathiassen	DEMOCRACY & EDP (DDE/DUE)	Denmark	late 1970's	Kensing, 1983, 1987; Kensing & Madsen, 1991
4.	Ciborra, ...	Local Authorities	Italy	late 1970's	Ciborra, Gasbarri & Maggiolini, 1987
5.	Bodker, Ehn, Kyng, Sundblad, ...	UTOPIA	Sweden, Denmark	1981-85	Ehn, Kyng & Sundblad, 1983; Bodker et al., 1987; Ehn, 1988; Bodker 1991; Ehn & Kyng, 1987, 1991
6.	Mambrey, Oppermann, Tepper & Schmidt-Belz	Local Government+ School Info System	Germany	1984-86 1984-85	Mambrey & Schmidt-Belz 1983; Mambrey, Opperman & Tepper, 1987
7.	Bjerknes, Bratteteig	Florence	Norway	1984-87	Bjerknes & Bratteteig, 1987, 1988; Bjerknes, 1992
8.	Vehviläinen	Study Circles	Finland	1985	Vehviläinen, 1986, 1991
9.	Clement, Zelechow	Self-Managed Office Automation (SMOAP)	Canada	1986-87	Clement, 1989 1990; Clement, Parsons & Zelechow, 1991
10.	Friis	PROTEVS	Sweden	1989-91	Friis, 1991a, b, c

Table 1: Participatory Design Projects

office workers, particularly women, could affect the outcome positively.

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 and finished in 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.

Claudio Ciborra lead a PD project in two small towns in southern Italy. The aim was to develop an information system for local socio-economic 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 to themselves. Within the project, participation was used is a tool to negotiate contracts on the provision of information.

UTOPIA, probably the best known PD project, was lead by Susanne Bødker, Pelle Ehn, Morten Kyng and several other researchers from institutions in Sweden and Denmark. Working closely with unions in the graphics industries, their overall objective was to "contribute to the development of powerful skill-enhancing tools for graphics workers" (Bødker et al., 1987, p.254). Stress was placed on the quality of work and product, not only in the design of the technology, but also in training, work organization, human skills, etc.

Peter Mambrey and his colleagues at the GMD research unit in Germany conducted PD research in the mid-1980's. One of the principal projects involved assisting users in a small school to develop their own local information system. A second one, in the more rigidly bureaucratic setting of local government, developed a system for providing information of interest to citizens. A major focus in each case was for users to investigate which particular tasks should be automated.

Gro Bjercknes 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 the development of an information system (IS) for daily information about the condition of the patients while decreasing the paperwork involved. Second: the 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 cooperation 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 Finish ministry involving weekly meetings with a group of women office workers. The main goal in the study circle "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 of the circle should be able to explain to their superiors what they really need and what kind of adp systems would be most useful for their work." [1986]

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 the introduction of microcomputers, primarily for wordprocessing. The aim of the project was to assist academic department secretaries in exercising greater control in the computerization of their work

Siv Friis describes two research projects carried out recently in Sweden in which she attempts to evaluate the use of the PROTEVS (PROTyping for EVolutionary System design) participatory system design methodology. The first case describes the application of the methodology in a local government administration setting, the second case is in a pharmaceuticals manufacturing 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 of participation, 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 participation 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" (p. 223)

Participation manifests itself in a variety of ways: the creation of technology assessment criteria and guidelines (Bradley, Kensing, Keul), creation of new organizational forms including support infrastructure (Clement, Vehviläinen), and the design of specific computer systems (Bødker, Bjercknes, Mambrey).

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 organisation.

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 participatory design in an organizational setting involving *users*, systems designers and management." (italics in original)

We discuss the prominent issues raised by these projects under three broad headings that roughly correspond to a project life cycle - setting, process and results.

Setting

An important part of the setting for a project is the industrial relations context in which it operates. Given that participatory approaches to systems development began with union initiatives and many of the projects were conducted in countries with high rates of unionization and co-determination legislation, it is not surprising that unions are very much in evidence. Where present, the local union provided support, occasionally resources, and in one case mobilized a strike. However, their importance and role 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] also notes as one of the least successful aspects of her project, the "difficulties in engaging the unions in practical work. [They generally preferred] to take part in the steering committee only." Keul, 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 role that the co-determination legislation plays in participatory design is an interesting one. It is seen as an enabling mechanism, it does not appear to be viewed as anything more than a broad framework within which local strategies have to be devised to address the local situation (Kensing, Keul). 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 traditions where local autonomy and problem solving are highly valued." She further observes that participation can function sufficiently smoothly through the local Work Environment Committees, that unions sometimes regard it unnecessary to involve themselves directly.

There are, however, 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 an increasing role of management. She sees signs today that 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 which was available to users to participate was also variable: The SMOAP project (Clement) 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 (Bjerknes) and Study Circles (Vehvilainen) 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. 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 paralyses 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." (p. 232)

Unlike conventional research, which is directed primarily at producing results of interest 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, etc. 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 aim[s] of improving the action and contribut[ing] to theory 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 lead by one or more of the researchers, and in 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 labour and shift initiative to users. Friis [1991] 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 'co-researchers' [the users]." (p.297) This reflects deep-rooted patterns of behaviour 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." (Friis, 1991, 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 (Bjerknes, Ciborra, Friis, Kensing, Keul). Vehvilainen used study circles, a variant of the working group in which 10 office support staff met regularly to learn from the researcher and each other about the technology and how to overcome the common problems they faced. The SMOAP project (Clement) used a similar approach, but with a rotating set of representatives from six secretarial groups involving 25 participants in all. In the Norwegian cases reported by Keul and Mambrey's 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 (Bjerknes, Mambrey). 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. In Kensing's Danish DDE project, union pressure was required before management approved of on-site meetings. Occasionally teams made visits to other worksites.

Techniques employed by researchers were similarly varied: software prototyping (Mambrey, Bjerknes), organizational prototyping (Thoresen), diaries (Bjerknes) and work analysis (Vehvilainen, Bradley). 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 (various respondents). 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 research project to investigate frameworks for enabling technology assessment by workers, management representatives sat on some of the working groups and actions were often aimed at management, but their particular contributions or influence on the process is seldom noted. It is likely that in the future this will have to 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 in-depth followup 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 reported result, especially in the technology assessment projects, is the increased consciousness by workers of the social implications of information

technology for them - that it is not neutral nor value-free. Some projects have led to union educational programs and materials that have been used for years. [Bradley QR; Ciborra QR; Kensing QR; Kjaer QR; Mambrey QR]. Bradley [QR] states that projects like hers resulted in a greater general awareness of the impacts of information technology for working life and for society, leading to changes in legislation (e.g. Work Environment Act), in education of edp-specialists, etc. She was surprised to learn recently that even school texts are reporting on her projects' findings. In Kensing's case [QR], 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 [Bjerknes QR; Clement QR; Friis QR; Kensing QR; Mambrey QR; Thoresen QR; Vehvilainen QR]. Kensing [QR] 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 on the one hand, and management and/or systems personnel on the other [Clement; Friis QR; Mambrey QR; Thoresen QR]. For instance, Siv 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 (Mambrey, Bradley) 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 by does not always lead to more positive attitudes about 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." (Mambrey et al, 1987, 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 fulfil its contract obligations by 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 lead to a 1:1 copy of existing thoughts into the new system, and is therefore "conservative". 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 firstly to the small size of the Scandinavian market, only 3% of the American in this software area; and secondly to lack of technical competence within the company responsible for developing and marketing the software product. However, this does not overshadow the other achievements. The project has been widely reported and has had considerable influence on discussions within the labour 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)." [Bødker, QR]. In summary, the PD projects reviewed here have justifiable claims to success in a wide range of areas. Between them they have: designed and implemented effective software; demonstrated new systems development techniques; improved understanding and initiative among workers; supported labour negotiations and education programs; prompted national legislation; and contributed to a broader public understanding of technology issues. Overall, it thus seems fair to conclude that the results of the PD projects have basically achieved their goals and have demonstrated promising new approaches to the development of information systems. However, the actual participatory experiments that spawned these innovations appear to be much more fragile. 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 the minute most of the research projects stopped". In the case of the SMOAP project (Clement), where a subsequent strike lead to the creation of a training program modelled 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 the projects had an inherent short-term focus and critical resources were withdrawn upon 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].

This experience suggests 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. 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 participatory design projects. We have assembled these mainly from the advice of the authors in reflecting on their own experiences with PD.

Initial expectations

Two fundamental notions recur throughout the project reports. The first is that participatory design is a complex process involving technology and multiple levels of organization. The second is that it is highly dependent on specific organizational contexts (Thoresen, Kjaer, Kensing, Clement). 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!"

Setting the Stage

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, practising 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, advisory panels etc. [Bjerknes QR; Friis, QR; Mambrey, QR] 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.

The Ongoing Process

Once underway, an expanding range of techniques, such as evolutionary prototyping and envisionment exercises, are available for helping participants design new work practises and supportive computer systems [Greenbaum and Kyng, 1991; Thoresen, 1992]. 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, 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 of the group must learn of its achievements and care about its survival. This is perhaps the hardest challenge, for it requires careful attention to organizational politics. While management must be persuaded 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 [QR] dramatic advice on this is to "smash pre-existing formative contexts; engage in tinkering at all organizational levels"! Expect surprises.

Reporting PD Research

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, etc.) were to be included explicitly in accounts. Discussion of political considerations and economic outcomes would also be valuable.

New Types of Project

Since most projects have been relatively small, we do not yet have much experience to draw upon 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 [Friis QR; Vehvilainen QR].

Democratization

The relationship between user participation in systems design and more general notions of workplace democracy is a complex and longstanding issue. As Thoresen [QR] notes:

"PD started as a question of information and workers' rights. It moved to productivity aspects. It [later became] an instrument for increasing productivity. Now the trend is towards 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. 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 will continue, but will require subtle handling.

Conclusions

The experiences from the projects reported here offer some encouragement and guidance for further development of participatory design. 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 users perspective and are still in operation. Systems development approaches specifically suited to supporting participative design 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 aspects of the broader organizational contexts upon 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 the patterns that limit the growth of their capabilities and thus undermine further initiative. Only by giving participation the meaning of full engagement in vital organizational affairs is the process likely to flourish and liberate.

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