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# User Participation and Democracy: A Discussion of Scandinavian Research on System Development

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## Abstract

*Scandinavian research projects in system development have traditionally put a strong emphasis on user participation as a strategy for increasing working life democracy. The article analyses a few of these projects with respect to this goal. We argue that there has been a development from politics to ethics in system development research, and that the political dimension should be reintroduced.*

*A reorientation of system development strategies aiming at increasing working life democracy can learn from the historical success stories, in particular the combination of global strategy and local action used in the trade union projects in the 60's. Recent development in technology and working life will, however, introduce new challenges to system development.*

## 1. Introduction

In the Scandinavian countries, user participation in system development has been discussed and practised for more than two decades (Aarhus 1975, Bjerknes *et al.* 1987). User participation refers to the involvement of users in work activities during system development—the forms and degree of involvement vary (representative or direct involvement, consultants, or collaborators). Influence refers to users having power to make design decisions—the degree of actual influence and power varies. User participation aims at involving future users of a computer based system in decisions during system development.

Three reasons for user participation in design are normally given, e.g., (Bjørn-Andersen & Hedberg 1977):

- improving the knowledge upon which systems are built,
- enabling people to develop realistic expectations, and reducing resistance to change, and
- increasing workplace democracy by giving the members of an organisation the right to participate in decisions that are likely to affect their work.

The first two reasons are rather practical, and they can be found in several system development approaches. The belief is that users' knowledge will improve the fit between the computer system and the work. The third reason is culturally and politically biased, and found in, e.g., legislation and political literature.

Many Scandinavian research projects in system development during the last decades have subscribed to the third reason—to increase workplace democracy. Democratic ideals emphasise the right to maintain a different opinion than those in power to forward opposing positions and to build knowledge on an alternative basis to support a different view. In a democracy those affected by a decision take part in the making of the decision. Historically this means giving equal rights for people with little or no power. All members in a democratic society should have the opportunity to take part in decision making through direct voting or through representatives voting for them. An organisation can be seen as an arena for different opinions to meet and—having a democratic ideal—be given a voice. *Workplace democracy* means the right for all employees to have influence on their work situation through work arrangements and participation in decision making fora. Work arrange-

ments usually concern several interest groups thus workplace democracy also includes balancing claims from the different stakeholders. Many of the Scandinavian research projects also aimed at increasing *working life democracy*, i.e., 'industrial democracy', expanding the workers' influence to include the societal level as well.

Jørgen Bansler and Philip Kraft started a debate about Scandinavian research on user participation at the Participatory Design Conference in 1992 (Kraft and Bansler 1992). They claimed that the research had little or no effect in society, and that it had outlived itself. The debate about the success or impact on society by Scandinavian approaches continued in panels at the following IRIS Conference<sup>1</sup> (Knudsen 1993), and in the April '94 issue of Scandinavian Journal of Information Systems, including the Kraft and Bansler article (1992), a commentary from Morten Kyng (1994), and an answer to this by Bansler and Kraft (1994). We want to join the debate with a slightly different approach: we want to discuss the underlying ideas of this research rather than the practical results thus taking into consideration how user participation in system development can contribute to democracy in working life and workplaces. The historical basis for much of the Scandinavian research on user participation has been aimed at finding strategies for increased working life democracy. We believe that the experiences from the last decades may be relevant to future system developers, even if the conditions for system development are rapidly changing. We want to create a discussion within the research community itself about how to utilise the large volume of experiences and knowledge.

Scandinavian approaches to system development have been characterised as user-oriented rather than management oriented and by their critical attitude (Iivari & Hirschheim 1992, Karasti 1994). One of several Scandinavian research approaches in which user participation has been predominant, has been called the *Collective Resource approach* (Ehn & Kyng 1987) or the *Critical approach* (Bansler 1989). The Collective Resource approach to design explicitly aims at 'democracy and skill' (Ehn & Kyng 1987, p. 56) for the workers, using the collective—the trade union—as a strategy to achieve this. This article follows two different trends of the Collective Resource approach that have ended up being rather different although they share the same starting point: the Scandinavian trade union projects in the early 70's. The fact that the projects are so similar with respect to their objectives make the differences between them interesting. We have chosen two trends that we know very well: we are part of one of them hence the article does not give an overview of all Scandinavian research on user participation in system development.<sup>2</sup> There are many reasons for basing our discussions on projects rather than theoretical contributions or influential persons. Within this particular tradition, the main theoretical contributions have come after the projects, as a result of the projects. A strong opposition to methods has emphasised the building of an empirical basis to criticise and improve existing methods. The fact is that the subsequent projects involved many of the same researchers. Thus the projects also reflect a development of ideas in some of the Scandinavian research communities.

The first part of the article describes and discusses earlier system development research. We start with a description of the first trade union projects. Section three describes a branch of projects characterised by their emphasis on design for the skilled worker. In section four we look at another project series starting approx. at the same time with the same basic values, but taking a different path by its focus on the use of computers in an organisational context. We summarise the projects in section five by discussing the contradictions between harmony and conflict, and politics and ethics. Section six discusses the four different levels of influence used in the research projects: work situation, work organisation, inter-organisational relations, and working life. In section seven we point at some characteristics of current development having consequences for future research on user participation in system development. In the last section we discuss user participation as a means of achieving democracy.

## 2. The Scandinavian Trade Union Projects

Historically the starting point for user participation in system development was the discussion about the relationship between work and democratic values in Scandinavia around 1960 (Gustavsen 1986). At that time, it was generally agreed that industry should level the general democratic principles in society, and that opportunities for increased individual engagement should be created as a means to increase productivity and efficiency (Thorsrud *et al.* 1964, Thorsrud & Emery 1970). A large action programme

for improving the working life in Scandinavia was designed and conducted as an industrial democracy programme by The Norwegian Federation of Trade Unions (LO) in cooperation with The Norwegian Employers' Federation (NAF). NAF was interested in rationalisation and improved organisational development; LO wanted to empower the workers. One of the results of the Cooperation Projects was a revised *Worker Protection and Working Environment Act* (AML 1977, Sørensen 1992). *AML's section 12* states that workers and their representatives shall be kept informed about systems used for planning and performing work, and about planned changes in such systems. Sufficient education for using the systems, and participation in the design process is emphasised. The main idea is that the workers themselves shall control and be responsible for performing work.

Within this cooperative climate, some more explicitly stated political projects were carried out to support and strengthen the trade unions. Stronger trade unions were supposed to contribute to democracy by giving workers a voice and an opportunity to influence their work situation. The trade unions were part of the existing power structures in society established to empower the workers.

The first political project was initiated by the Norwegian Iron and Metal Workers' Union (NJMF) in a resolution made at the annual meeting in 1970 (Nygaard and Bergo 1974, Nygaard 1979). The NJMF project started in the beginning of January 1971, and ended before summer 1973. The objective was to apply a workers' perspective on development and introduction of new technol-

ogy in order to produce an action plan that would represent and strengthen the workers' position with respect to introduction and use of computer technology.

The NJMF project emphasised that knowledge gained locally should be a basis for the trade unions to act on a central level. The results from the project included technology agreements (the first made at A/S Viking Askim in 1973), textbooks, and vocational training programmes on technology.

The Swedish DEMOS project (DEMOKratiske Styringsystemer) from 1975 to 1979 did research on behalf of the responsible and skilled worker (DEMOS 1979, Ehn & Sandberg 1979). The basic assumptions were that the use of computer technology contributes to rationalising work and deskilling workers, and that there is a fundamental conflict between workers and employers that cannot be resolved. The responsible worker has the right and duty to participate in decisions concerning both what is produced and how it is produced. Power is not equally distributed between workers and management, however, and a model for negotiations between management and unions on the introduction of computers was proposed. The negotiation model more or less institutionalises the conflict between employers and workers.

The objectives of the Danish DUE project (Demokrati, Udvikling og Edb) from 1977 to 1980 were to build up resources within unions to increase the unions' influence on the use of computer systems. The project also aimed at contributing to a professional curriculum and research programme in systems development (DUE 1978 & 1979, Kyng & Mathiassen 1979).

The first trade union projects, NJMF, DEMOS and DUE, have some characteristics in common. They were based on the contradiction between capital and labour<sup>3</sup> claiming that there is an antagonistic relationship between the two. They aimed at strengthening the labour side of the contradiction between workers, representing the labour, and management, representing the capital in order to make the struggle more even. They were striving for a democratic research and development process claiming that researchers have the duty to support those with less power and resources. They also claimed that, when not reflecting on their role, researchers often support those in power (Sandberg 1975). The projects departed from strong trade unions, and they were mainly concerned with the organised work force and mainly with production. The researchers believed that working life democracy can be reached through trade unions as institutions representing a workers' collective.

### 3. Design for the Skilled Worker

The experience from the trade union projects showed that strong unions may increase the workers influence on technology, but that this is not sufficient. It appeared to be necessary to create alternative technologies as well, to fight vendors' monopoly. The focus shifted to the means of production and the form and content of the working conditions. The next 'generation' of projects thus concentrated on technological alternatives.

#### 3.1. The UTOPIA project

The UTOPIA project (Utbildning, Teknik, och Produkt I Arbetskvalitetsper-

spektiv) from 1981 to 1984 was a joint research project including several Scandinavian research institutions and the Nordic Graphical Union (UTOPIA 1981).

The goal of the UTOPIA project was to develop technology for graphical workers that contributed to high quality graphical products, skilled work, and a democratic organisation of work. The project aimed at creating technological alternatives for the involved trade union. The project limited its focus to work processes concerned with page make-up and image processing in the newspaper industry. The research site was a laboratory, in which trade union representatives participated as skilled workers.

In order to make a requirements specification for a computer system to support the chosen work process traditional as well as less formal system descriptions were used. The descriptions were not successful as means of communication as they were too abstract. It turned out to be easier to involve graphical workers in the design process through a rather concrete approach using mock-ups and simulations of computer based working environments (Ehn 1989). The mock-ups were more or less sophisticated, like paper boxes representing mouse and laser printers, or large paper drawings and (later on) slides showing alternative screen layouts (Bødker *et al.* 1987, UTOPIA 1985). It has been put forward that one of the benefits from this approach is that the workers do not have to explicate their work processes, they can express their craft skills by demonstrating and doing their work. This approach was called 'design-by-doing'.

The concrete result from the UTOPIA project was a requirements specifi-

ication for a computer system for graphical workers delivered to the vendor Liber. A pilot system Text and Image Processing System (TIPS) was developed based mainly on the specification, and the application was tested in some newspaper test sites. However, the vendor ran short of capital before the development of a commercial product was ended, and the application was never used (Ehn 1989).

At the end of the UTOPIA project, the 'tool perspective' was developed, summarising the basic ideals of the project (Ehn & Kyng 1984). The tool perspective is a design approach inspired by the tool design within traditional crafts and influenced by the workers' control movement (Sandberg 1984). The computer should be a tool for the skilled worker, and the worker should be in control of the tool. The tool is conceived as a means of forming raw material into more refined products—tools are extensions of the accumulated knowledge about tools and materials in a given work process. A specialised tool presupposes professional skills from the users. The tool perspective fits with the design-by-doing approach.

The basic assumption in UTOPIA was that democracy can be increased by changing the balance of the contradiction between labour and capital, by strengthening the labour side. The labour side can be strengthened through trade unions. The work force was to build its power on knowledge about work—as do guilds and professions. Control over work can be achieved through specialised tools controlled by workers through (i) tools requiring specific knowledge for use, and (ii) a collective that controls the production of professional knowledge.

Computer systems can act as specialised tools controlled by workers, and give them more control over their work.

Formal institutions like trade unions are modern versions of guilds. Like the guilds, trade unions emphasise one group of workers without relating to other groups or the workers collective; they want to control the means of production, and they want to protect the professional interests and jobs of their members. Since democratic ideals emphasise a legitimate right for all groups to further their interests research on behalf of one union does not necessarily contribute to a more democratic working life. An example from UTOPIA is the (female) perforator typists. Their work has been conceived as just typing on PCs the text that journalists have written on typewriters. Their work thus depends on the fact that journalists do not use PCs. Gunnarson & Lodin (1983) discuss how the perforator typists in their work situation can benefit from the new technology by arguing that they take over some of the work tasks traditionally performed by graphical workers. It is difficult to spot effects of this view in the concrete work agreements approved by the UTOPIA project, e.g., (Dilschmann & Ehn 1984).

We consider the UTOPIA project as a continuation of the history of guilds and trade unions as a support to graphical workers at the expense of women and unskilled men in the composers' room, described by Cockburn (1983). Consequently, the UTOPIA project has not contributed to the sort of workplace democracy in which all stakeholders have a voice in the design of a new computer system. Besides, the laboratory setting of the design process may have weakened the possibilities for influencing real life

work situations. The basis for design of the TIPS system was to control the craftsmanship by one occupational group rather than to support a set of work tasks carried out by that group in coordination with other occupational groups.

### 3.2. Cooperative design

The UTOPIA project has inspired research in the 90's aimed at understanding and supporting the process of design as a cooperative effort, e.g., (Greenbaum & Kyng 1991, Grønbæk 1991, Bødker & Grønbæk 1991, Mogensen 1994, Kyng 1991).<sup>4</sup> The basis for this research is the tool perspective and the design-by-doing approach. The basic assumption is that a computer system that fits work and is controlled by a worker can improve his/her work situation. The process of developing the system needs to be influenced by the worker in order to get a good 'tool'. Focus is on how to conduct a participatory design process in which users can influence the system. The design process is closely tied to a concrete work situation.

The cooperative design process focuses on the future use situation. In addition to what is described through formal system descriptions, it is important to pay attention to tacit knowledge and implicit, shared understanding. Even, if possible conflicts within the organisational context is discussed (Bødker & Grønbæk 1991), the emphasis is put on activities for facilitating user involvement in the design process. Cooperative prototyping may uncover conflicts, but the 'conflicts cannot be dealt with or resolved by experimental design' (Grønbæk 1991, p. 47).

Greenbaum & Kyng (1991) include a collection of techniques for cooperative

analysis and design. Many of the contributors place themselves within a tradition of workplace democracy and worker participation in design. Greenbaum and Kyng argue for participation emphasising usefulness and quality of the product rather than workplace democracy.

Cooperative design certainly supports user participation. But the focus on process, action, and situatedness tends to disconnect the design process from the larger organisational context in which power is enacted. The scope is the design process itself viewed as a (rather harmonious) dialogue between a designer and a user about the design of a particular computer application. For a cooperative design process to increase workplace democracy, the design must be realised in a computer system—and the organisation must be willing to introduce the proposed changes. If this is not the case, the participatory design process becomes a pleasant experiment for those who participated—but the democratic ideals turn into an illusion, cf., (Procter & Williams 1992). The underlying belief is that a democratic process will give a democratic result (i.e., an improved work situation) therefore computer systems developed in a cooperative process have a liberating power. This is not always the case.

## 4. Use of Computers in an Organisational Context

The second branch of projects also had their basis in the first trade union projects and shared the same values, ideas, and beliefs as UTOPIA. Due to practical differences, however, the projects developed differently—towards a focus on the

organisational context rather than the skilled worker.

#### 4.1. The Florence project

The starting point for the Florence project, from 1984 to 1987, was concerned with the fact that the large computer manufacturers may get too much influence on the workplaces through computer systems mainly aimed at automation and rationalisation. A counter strategy based on the trade unions' power and will to negotiate the introduction of computer technology in an organisation or a branch was considered to be too defensive. A more appropriate answer to the large manufacturers would be computer systems based on the knowledge of a profession. A profession was considered to be the knowledge workers' counterpart to the trade unions—sometimes coinciding with a union. Like the trade unions, a profession organise employees across many different organisations, e.g., the medical profession.

The Florence project focused on nursing for several reasons. Nursing is a profession interacting with other professions. It is female dominated as opposed to previous trade union projects. Nursing includes 'non-production work', i.e., reproduction, service and information giving activities, and involves an interesting mix of manual and knowledge based work.

Before the Florence project started, the 'application perspective' was developed as a background for the research, cf., (Bjerknes & Bratteteig 1984). The application perspective emphasises that computers should be understood in the context in which they are used, the value of computer systems is demonstrated when the computer is used. Computers

should be designed as instruments for work. The benefit of a computer system should be evaluated with respect to its users, not to the organisation as a whole. The basis for design should therefore be the knowledge needed to maintain daily work routines rather than production routines.

The aim of the Florence project was to build computer systems for nurses' daily work, based on their professional language and skills. Technological solutions should be tested in real work situations, cf., the application perspective. The project therefore took place in a hospital ward. To avoid the bias from one workplace two hospital wards were involved in the project.<sup>5</sup> Due to the workplace orientation a strict bias towards the nursing profession was difficult to maintain; other occupational groups, like physicians and nursing assistants, had to be considered as well. These groups were therefore also represented in the project group. A representative from the professional nursing federation participated in the steering committee of the project.

The project resulted in two prototypes (Bjerknes & Bratteteig 1987a; Bjerknes *et al.* 1985) and a pilot system which was used in the hospital ward even after the formal completion of the project (Bjerknes & Bratteteig 1988a). The pilot system is an example of a computer system built to support a profession. Even if the organisation of the professionals' (trained nurses') work activities varies in different workplaces, the project concluded that it is possible to build profession oriented systems.<sup>6</sup> This requires, however, that the system is based on an understanding of the basic nature of the profession. And in order to be useful, an application has to be tailored for specific

work situations. The project came to the conclusion that computer applications depend on the organisational and physical design of the use context.

Even with its focus on use, the application perspective is centred around computers. The future use situation is the basis for design. Hence, expertise from both the application domain and information systems development is needed in system development projects. Mutual learning is essential; both users and designers need knowledge about each other in order to communicate (Bjerknes *et al.* 1985). The activities labelled 'mutual learning' resemble activities later described as cooperative prototyping and participatory design (Bjerknes & Bratteteig 1987a, 1987b, 1987c, 1988b).

The project was limited as to the size of the system development effort. The pilot system could have been more useful if integrated with other computer systems in the hospital. This raised the question of how local and situated it makes sense to be. A focus on local needs ensures an awareness of particular local interests. However, sometimes a local unit will benefit from improved communication and coordination with other units. Relations between work groups cannot be properly catered for from an application perspective.

The application perspective is a 'one-party perspective'. In spite of its basis in the institutionalised conflict between labour and capital, the project was rather harmony oriented as the one-party perspective implicitly assumes harmony within the workers' collective. Several important conflicts in working life will be ruled out as 'uninteresting' within this perspective. By its emphasis on one perspective the application perspective is

subject to the same criticism as the 'UTOPIA branch' of projects, even if the Florence project included several interest groups in the design decisions (Bjerknes & Bratteteig 1988a).

The project addressed the organisation as a whole to a certain extent, by discussing the totality of the information systems in the ward. The totality of an organisation can be addressed in two ways, through a management perspective or by emphasising that there are several differing perspectives depending on various stakeholders' organisational positions and roles. In the Collective Resource approach, the notion of organisation as a whole has been interpreted as a management's perspective on the organisation. A computer system supporting the organisation as a whole thus is a computer system supporting the capital side of the contradiction between labour and capital. This interpretation goes well with how the notion of organisation as a whole was described in system development approaches at that time.<sup>7</sup>

The Florence project experienced the second interpretation to be just as valid. A computer system for the organisation as a whole realises a compromise between the interests and needs of a variety of user groups. The goal is to balance the interests because there is no such thing as a homogeneous user group, not even within a single ward. The view that there are different stakeholders in a systems development process fits the Collective Resource approach. The Collective Resource approach predefines the stakeholder groups to be workers vs management. In real life, however, the different interests can involve conflicts within the workers' collective, or (groups of) work-

ers and management may share the same interests.

#### 4.2. Integration and redesign

The FIRE project (Functional Integration through REdesign) from 1992 to 1994 aimed at developing principles, techniques, and guidelines for redesign of computer based systems so that the systems could become functionally integrated for groups of users (Bjerknes *et al.* 1991, Braa *et al.* 1992a & 1992b). The objective was to explore how to build computer systems for an organisation as a whole, given that organisations include a variety of interest groups with partly conflicting goals, and given that a number of computer systems coexist, but do not interact properly. The project was concerned with problems in large development projects and in maintenance of computer systems—addressing some of the weaknesses of the application perspective.

One of the basic assumptions in the FIRE project is that users have a stake in redesign as well as in design, thus the redesign process must be properly organised to facilitate user participation (Braa, Bratteteig, and Øgrim 1994). Many users have to relate to several applications in order to carry out their work tasks, and the applications often do not fit each other or the work. Functional integration refers to that users should experience the applications as an integrated whole. Redesign is an opportunity for functional integration, and the wish for integration may lead to redesign. Post-implementation changes of computer based systems must be expected; thus it is necessary to organise and plan for continuous redesign of the system (Bjerknes, Bratteteig and Espeseth 1991). Integration of com-

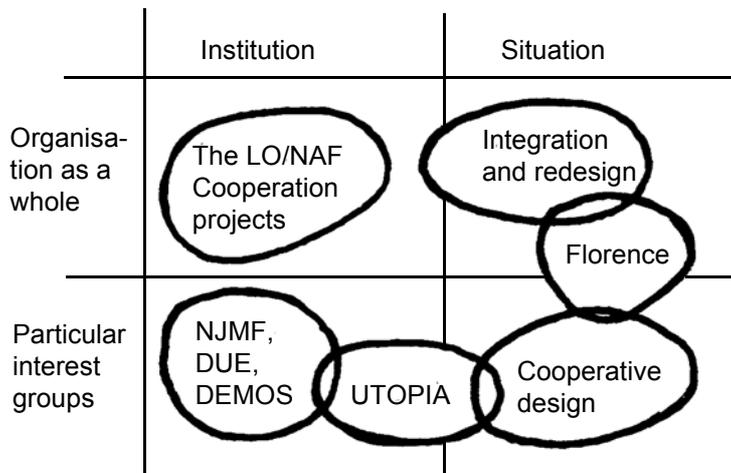
puter based systems often unveil conflicts between different parts of the organisation and between local and central interests. The basis for redesign is the work situation, but the overall organisational objectives are given more weight than any single work process.

Many of the FIRE project activities are not easily characterised as inheritors of the Collective Resource approach, even if power and differences between groups of stakeholders are emphasised. The work of data shop stewards and the work environment agreements are discussed with respect to redesign (Kaasbøll & Øgrim 1994). FIRE's focus on the technological infrastructure results in emphasis on common interests through dialogue based strategies (Braa 1994). The aim at making practical compromises that can be accepted by everyone may lead to a position similar to the Socio-Technical approach, criticised by the trade union projects for being manipulative (Ehn & Kyng 1987).

## 5. Historical Lines in the Scandinavian Research

The projects described are so far all aimed at increasing the degree of participation and influence of users in the system development process. We summarise the discussions by drawing some historical lines that concern the political debate in system development research (cf., Figure 1). The first part of this discussion is concerned with where to start when doing the research; whether it should be from a particular interest group or from an organisation seen as a whole. The second part of the discussion is concerned with the strategy for achiev-

FIGURE 1. Illustrates the dimensions used in analysing the research projects



ing democracy, by using existing institutions, i.e., structural regulations like legislation and working life organisations, or by acting in the system development situation, emphasising knowledge and techniques possessed by the actors in the situation.

5.1. Conflict or harmony perspective as basis for a strategy

The difference between considering the organisation as a whole or as a particular interest group in the system development process may characterise the difference between the Socio-Technical and the Collective Resource approach. The Socio-Technical approach stresses on the one hand that employers and employees have a common interest in developing useful computer systems, and has discussed and developed techniques for stakeholder participation (Bjørn-Andersen and Hedberg 1977, Bostrom and Heinen 1977a & 1977b, Markus 1983, Mumford 1983). The organisation as a

whole is addressed, and the emphasis is on balancing different interests.

The Collective Resource approach, on the other hand, emphasises the fact that there is an inherent conflict between employers and employees, and that it is the researchers' duty to support the weaker party, i.e., the employees (Sandberg 1975). Here the conflict refers to the antagonism between capital and labour. The conflict orientation emphasises fight and confrontation as a strategy for strengthening the labour side in order to make the fight between the sides more even. Followers of the Collective Resource approach have criticised the Socio-Technical approach for being harmony oriented through its stress on balance and consensus (Sandberg 1975, Ehn & Kyng 1987, Ehn 1989, Bansler 1989). The Socio-Technical approach has handled the contradiction between labour and capital by emphasising the depend-

encies and common interests between the two sides (the identity).

Interestingly enough, it is difficult to see a difference between Socio-Technical and Collective Resource approaches in practice. Knowledge about conflicts between labour and capital has been an important basis for the organisation of projects in both traditions. In all projects carried out within an organisational context a certain degree of cooperation with management has been necessary—it seems to be very difficult to introduce technology against a management's will. It is difficult to act in accordance with a 'pure' conflict-oriented view emphasising only the struggle between the sides of the contradiction (the caricature being no common interests at all between employees and employers). The interdependencies in a contradiction creates a mutual interest in preserving the relationship—often resulting in creating common interests at some level of abstraction. The use of negotiation models, in which workers and management are seen to have both conflicting and common interests, both being interested in achieving an acceptable solution, has been suggested by advocates for the conflict oriented view, e.g., (Ehn and Sandberg 1979). A moderate emphasis on identity can be found in techniques like participative design (Emery 1993), democratic dialogue (Gustavsen 1992), and search conference (Pålshaugen 1986) aimed at giving all stakeholders an opportunity to have a say and through this process create a common understanding.

The Collective Resource approach is an anti-thesis to management friendly approaches by assuming that computer systems built for the organisation as a whole support an economic oriented

management perspective. Management friendly approaches support management, whereas the Collective Resource approach supports the workers. At this point some will be tempted to jump to a synthesis consisting of a balanced view, the perfect mix of conflict and harmony. We hold the view, however, that the harmony-conflict axis simply is not a good way to handle the contradiction between labour and capital. The axis is based on the assumption that labour equals employees—represented by trade unions—instead of the more general labour. As the capital side is seen as equal to the management many aspects and levels of capitalistic influence are not addressed at all, e.g., ownership of information. Important aspects of working life, e.g., different employment contracts (full time, part time, temporised) and qualifications (skilled, unskilled) are left out when the labour side equals organised workers. It is also important to notice that when the worker side of the contradiction alone defines the area of discussion, the (current) division of work is taken for granted. This makes the labour side vulnerable to all sorts of actions from the capital side, e.g., radical organisational changes like business process reengineering or the conflict between employed and unemployed (cf., Section 7).

### 5.2. *Political or ethical roads to democracy*

The arena for achieving democracy can be discussed along the distinction between established institutions and situated actions. The early projects used institutions as means to develop and introduce stronger institutional regulations in order to achieve and secure democracy. At the same time, the active use of insti-

tutions strengthened the position of those institutions. The early projects contributed to laws and agreements that (still) regulate the introduction and use of computers in working life. The LO-NAF Cooperation projects achieved to get workers represented in board of directors (Thorsrud *et al.* 1964), the early trade union projects developed a model for negotiations between workers and management to ensure a democratic negotiation process (Ehn & Sandberg 1979).

When the focus of the projects shifted from working life in general to specific workplaces, the arena for system development—and democracy—shifted from structural institutions to actions in particular situations. Now, the efforts were concerned with how the (individual) system developer should act in a particular setting. The objective still was to ensure workplace democracy and to increase the possibilities for a weak group to have influence. Design-by-doing and mutual learning are examples of approaches that fit this perspective.

All the projects in the 70's had an explicit political bias in wanting to change the preconditions for system development. The system developers played the emancipator role. In addition to structural regulations for controlling resources and rights to influence and participate, the workers were given power through development of alternative knowledge. The alternative technological solutions were conceived to be liberating. From the middle 80's, the quest for democracy was left to the individual system developer, the creator of the liberating technology. The responsibility of a professional system developer changed towards being a facilitator of a morally—and legally—'correct' system develop-

ment process. The shift from emancipation to professionalism has been supported by numerous suggestions to professionalise systems development (e.g., (Andersen *et al.* 1986, Dahlbom & Mathiassen 1994)), and an increased interest in professional ethical rules, e.g., ACM code of ethics (ACM 1993b). The snag here is that the individual system developer should undertake a rather impressive personal responsibility for the systems s/he is developing, without a professional organisation to support them when running into problems or conflicts (unlike, e.g., physicians or trained nurses).

We interpret this as a shift from the political to the ethical system developer. The political system developer is an emancipator, carrying out an action programme to give the weak parties knowledge they can use to increase their power. The emancipator uses and strengthens existing institutions as means to achieve working life democracy. The ethical system developer is mainly responsible towards their own individual ethical code—which might happen to be political. Ethical individuals act morally in the particular work situations in which they find themselves, promoting workplace democracy through engagement in system development situations. We see a historical development from focusing on politics and organisations as a whole (the LO-NAF Cooperation projects), to particular interest groups and politics (NJMF, DUE, DEMOS, UTOPIA), through a focus on particular interest groups and ethics (Florence, Cooperative design), to a focus on the ethics and organisation as a whole (FIRE). The development is illustrated in figure one, starting at the upper left square, proceed-

ing through the lower left, the lower right, and the upper right squares.

## 6. Arenas for Participation and Democracy

The Scandinavian system development research projects describe several ways to strive for democracy. The projects described in this article give examples of four levels of influence: (1) work situation, (2) workplace, (3) inter-organisational relations, and (4) working life. All four levels of technological influence require different strategies and means for influence. This section summarises the historical account with a discussion of strategies and means used at each level.

### 6.1. The work situation level

At this level the use of technology depends on the nature of the work tasks. Computer technology is used as instruments and communication media at work.

The computer technology to be influenced is computer applications: off-the-shelf products, tailored commercial applications, or in-house developed applications.

Employees can achieve influence by participating in development projects, or by selecting applications. Current organisation of work is taken for granted, and the influence is concerned with improving the work situation. Means of influence are project management and techniques for user participation in the concrete system design processes. The influence on this level increases as user-driven system development projects are becoming more common (Clark 1992). Florence and the Cooperative design ac-

tivities have contributed to the means for influence in this category, as have NJMF, DUE, and DEMOS.

### 6.2. The workplace or organisational level

At this level the use of technology will depend on how different activities are coordinated and integrated in the organisation. The use is argued for with reference to an overall organisational goal.

Computer technology at this level includes the technological information infrastructure, realised as, e.g., centralised mainframe systems, common systems, or networks; it also includes choices of standards and basic software. The infrastructure is a frame for possible future applications, and a need for particular applications may have impact on the choice of infrastructure.

In order to ensure the right of all workers to influence their work situation and to achieve workplace democracy, it is necessary to address the whole organisation. The users' influence on the technology may therefore be more indirect at this level; they may just as well try to influence overall organisational goals as the chosen information technological infrastructure. Changes in organisational structures will be based on the organisational goals. Influencing the infrastructure is relevant to the extent that the technological infrastructure may support or hinder the development of desirable applications, i.e., alignment of infrastructure with business goals. The Socio-Technical approach aim at influencing this organisational level, cf., (Hirschheim & Klein 1994), as does FIRE. Business Process Reengineering (BPR) also addresses this level with the objective to neglect the current work organisation

(Hammer 1990, Hammer & Champy 1993).

### 6.3. *The inter-organisational level*

At this level, the use of technology aims at facilitating the relationship between an organisation and its environment—potential business partners, competitors, customers, the market. In order to design a technological infrastructure that supports both the organisation internally and its relation to the environment, it is necessary to understand how changes in the environment can and will affect the internal structure of the organisation.<sup>8</sup>

We distinguish between two different inter-organisational relations, a) business relations and b) strategic relations.

- a. Business relations are regulated by contracts, like the relation between a subcontractor and a contractor. This kind of relation can be supported by networks and standards, like Electronic Document Interchange (EDI). Technological influence may in some situations be restricted to selecting a subset of the EDI standard that will be used in the business relation.
- b. The second inter-organisational relation, the strategic one, is found when several organisations have a common, strategic interest in influencing something or someone. The subject of interest may be related to computer technology. The means of influence can include lobbying or forming of inter-organisational groups, e.g., international user groups like DECUS and ITU's standardisation work groups. However, more local level arrangements fit here as well, e.g., pressure groups

composed of representatives from different use organisations using products from the same software vendor, e.g., a software house selling software to local authorities (Braa 1994). The UTOPIA project fits in here. The Nordic Union of graphical workers had a strategic interest in developing alternative knowledge and technology that could strengthen the position of their members. This was also the case in the Florence project.

The importance of the inter-organisational level has increased during the decades, and we believe that it will be even more important for future system developers as network technology becomes widespread. We expect that the two forms of inter-organisational relations discussed above will merge. The 'virtual organisation', a network consisting of small and medium-sized enterprises that cooperate for improving their position on the market<sup>9</sup> have aspects that are oriented to both business and strategic alliances. Current Socio-Technical approaches, e.g., (Gustavsen 1992) encourage building and maintaining networks between organisations in order to exchange and develop knowledge and common business strategies, seeking to integrate the two kinds of inter-organisational relations.

### 6.4. *The social or working life level*

This level comprises legal laws and regulations for the society, including the working life. The means for influence is in the legislation and social institutions.

Important examples are *The Worker Protection and Working Environment Act* (AML 1977) and laws to protect the privacy of citizens with accompanying institutions undertaking the control and fulfilment of the laws. Non-governmental institutions at this level are society-wide associations or multi-national companies.

Use of technology at this level includes societal infrastructures like roads, railways, telephones, mass media—and electronic networks. Computer technology at this level is public accessible software or information, e.g., games and information from bulletin boards via the Internet. The integration of computers with telephones, broadcasting, and publishing makes the every-day life of a citizen more dependent of technology.

At this level the information and software distributed by the technology is just as important (and a more realistic) arena for influence as the technology itself. An illustration of this is the current debate in Norway about how to control the Internet with respect to prohibiting distribution of pornographic material.<sup>10</sup> A traditional institution for controlling this would be a legally responsible editor-in-chief for every bulletin board. However, an editor-in-chief cannot possibly control every message on the net that can be reached through her/his bulletin board (Hannemyr 1994). The debate illustrates that new institutions may be needed in order to control and influence current technology.

The LO-NAF Cooperation projects and the first trade union projects (NJMF, DUE, DEMOS) can be seen as rather successful attempts also to address this level of influence.

The lesson to learn from history is that techniques aimed at user participation in system design should be accompanied by means and strategies aimed at other levels of influence. The LO-NAF Cooperation projects and the NJMF project are good examples. They both emphasised local action and global strategy, and their success lay in the way the two levels of influence were combined. Global strategies should provide a framework for local action, local actions should be exemplars informing and grounding the global strategy.<sup>11</sup> Local action can benefit from many years of development and experiments with user participation techniques. In our view the one-party perspective is too limited, therefore the boundaries of the locale should include more than one particular interest group. We suggest more emphasis on the organisational level than in the early projects, addressing not only local and societal levels (e.g., local and central trade union), but also trying to handle issues across groups and organisational boundaries.

## 7. The Conditions for User Participation are Changing

The environment for systems development is changing. Computer technology is developing, integrating different kinds of technology, and the support for communication and information processing is becoming more important. The focal point of organisational development is the customer rather than the employee. The competition on the market has increased, and today the market is global. Computer technology is used for a variety of work and leisure activities—not

mainly for production. Information technology contributes to changing the relations between work, leisure, and education. Technological infrastructures serving both professional and customer markets change the division of work between employees and customers (tele-shopping etc). We are going from a society where labour is a critical resource to a society where information and knowledge are conceived to be critical, e.g., (Fortune 1994). At the same time workers and unions have lost their influence in society compared with the 70's due to the global economy and the increasing rate of unemployment. We expect that the differences between 'information rich' and 'information poor' people, organisations, and societies will grow.

Significant changes for system development that have an impact on the Scandinavian tradition can be found in the recent organisational development, the changing role of unions and technological changes.

### 7.1. *Organisational development*

In general, working life is subject to increased demands for productivity. More work is left to the client (like tele-shopping, banking). The high demands result in less resources for organisational slack thus organisation and coordination of work tasks become even more important.

This has resulted in radical changes in the way work is organised. Some of the new opportunities are connected to the introduction of telecommunication. The European Union expects and promotes a rapid growth in 'virtual organisations', i.e., organisations that consist of (parts of) well established organisations that may exist temporarily. The number of teleworkers is increasing, due to the

fact that telecommunications can connect employees to work-related information through portable computers, modems, and networks. Employees may work at home, a long way from the employer's headquarters, and they may regulate their working hours according to their own wishes. Technology is being used to manage the distributed work organisation.

Change processes like system development normally aim at a limited effect when it comes to organisational changes. More radical changes like business process reengineering are aimed at reducing management staff and giving more responsibility, freedom, and challenges to the individual employee as this enhances the flexibility and competitiveness of the organisation—even though workers may lose their jobs during a BPR process.

Change processes are full of conflicts, and the use of power is often necessary to introduce the required changes, in particular when the change is radical. Some of the organisational changes we can expect in the future will probably be characterised by coercion and use of power. The climate for organisational changes is not as cooperative and harmonious as it was in the 70's, thus one of the premises for the Collective Resource approach has changed. The Collective Resource approach will have to adapt to organisational changes that take place in hostile and coercive environments.

### 7.2. *The changing role of trade unions*

The role of trade unions as social actors promoting working life democracy is a major point in the debate on the 'export of Scandinavian participatory techniques' to non-unionised cultures, e.g., the US, cf., e.g., (Kraft & Bansler 1992,

Bansler & Kraft 1994, Kyng 1994, Greenbaum 1993). The American tradition of democracy is based on the engagement of individuals in social movements (feminists, ecologists etc) which practice democracy in a limited scale—some of them opposing trade unions as a part of the existing power structure. The European tradition emphasises formal structures giving democratic rights to citizens, e.g., trade unions. Trade unions are created to address the institutionalised contradiction between labour and capital, thus they can participate as political actors in the public debate. They can be pressure groups on both organisational and inter-organisational levels. But the trade unions are not as powerful as they used to be. The patterns of organisation change in Scandinavia, and unemployment weakens the position of the trade unions both locally and centrally. The high unemployment rate may result in more confrontations between different trade unions, and between different groups of workers—even if some trade unions unite to gain strength. The trade unions constitute an inter-organisational network, but the network has become an institution that only addresses the contradiction between the employees and the management/owners—as opposed to the contradiction between labour and capital. The trade unions have difficulties in relating to unemployed and temporary workers as well as conflicts between groups of workers or between organisational units, cf., e.g., (Bos *et al.* 1994).

Thus it is no longer obvious that trade unions are the most strategic institutions through which democracy can be achieved. The changing role of the trade unions may lead to a need for applying a

different set of strategies and institutions for achieving democracy.

### 7.3. *Technological changes*

Technology itself may affect the possibility for influence at different levels. Computer networks connect people from different departments within organisations, between organisations, and between societies and countries, across well-established borders, and thus give new opportunities to seek partners and strategic alliances. The technology constitutes an infrastructure that can be used by individuals or groups to make a change. Company-wide (electronic) bulletin boards can be used as means for changing management decisions (Bishop 1994). A news group on the Internet can force a computer manufacturer like Intel to admit a serious error in one of its processors, a contrast to Intel's current practice of only admitting errors to customers that do not inform anyone (Leveraas 1995). Network technology could be used by trade unions to make connections across departmental, organisational, and national borders, to address and counter-challenge the capitalistic move to higher levels of influence (Leonardsen 1994).

Social networks is transformed into technical ones, and the technical networks give new opportunities for creating social networks. Still, the technological infrastructure is a tool for those who control it, and a structural institution for those who do not.

## 8. User Participation and Democracy?

The Collective Resource approach is based on the assumption that there is a connection between a democratic process and a democratic result. The democratic result should be a workplace—and a working life—in which everybody has a voice and in which all voices are heard and have an impact. A democratic process is a process in which everybody has a voice and in which all voices are heard and have an impact. This definition rules out computer solutions that favour one interest group at the expense of others, like the UTOPIA project, even if the process can be characterised as democratic because both graphical workers and the management of the newspapers have a say. The definition also points to the difficulty of being democratic when being very local, like the Florence project because the local process delimits the number of groups that have the chance to be heard.

Sometimes a democratic result requires a non-democratic process. One example is arrangements for admitting more women into male dominated areas, in which quotas and special arrangements may seem unfair to an individual male not offered a job or position, but which in the long run will make working life more democratic. A truly democratic process can be conflicting and may have to challenge the present perspectives and traditions. The basic assumption in the first trade union projects was that the world is not democratic, and that a democratic process will confirm and even strengthen the differences between those with power and those without. The democratic processes at a local level were

linked to global strategies aiming at a democratic result at the central union level. In the locally oriented projects, the link between the local democratic process and some global democratic result disappeared. A computer systems itself cannot be a means for emancipation; if it is used in a context in which its users have influence, it may support their power.

The challenge for future research is to contribute to democracy in a changing working life and workplaces. To achieve this it is not obvious that user participation in system development activities is a means or the only means. User participation in coercive change processes might not be a contribution to democracy. The change of power structures in society during the last decades is an important challenge for system development research which cannot be dealt with without discussing the political dimension. All the four levels of influence: (1) work situation, (2) workplace, (3) inter-organisational relations, and (4) working life need to be addressed and put into action. Further discussion and experiments on other kinds of institutions and local actions different from the ones we know from the Collective Resource approach are necessary to reintroduce the democratic dimension in system development research.

### Notes

<sup>1</sup>The Information Systems Research seminar in Scandinavia (IRIS) is an annual seminar for researchers in system development in Scandinavia. The 16th IRIS was held in Denmark in 1993.

<sup>2</sup>Overviews are given in, e.g., (Clement & Van den Besselar 1993) and can be found in (Aarhus 1975,

Briefs *et al.* 1983, Bjerknæs *et al.* 1987, ACM 1993a).

<sup>3</sup>Marx formulated the notion of contradiction, cf. also (Braverman 1974). In dialectical thinking a contradiction is a relation between two mutually dependent sides. A contradiction is characterised by having both 'identity' and 'struggle'. The 'identity' between the sides explains what makes the relation a whole. The 'struggle' or conflict between the sides threatens to tear the relationship apart. The use of dialectics in systems development is discussed in, e.g., (Bjerknæs 1992).

<sup>4</sup>Other research efforts have been carried out by the UTOPIAN successors as well, e.g., production of computer support for cooperative work, the EuroCODE project (cf., e.g., (Grønabæk *et al.* 1993)) and cooperative design in an organisational setting: the AT project (ArbejdsTilsynet) (Bødker *et al.* 1993, Bødker 1994). We do not discuss these projects in depth in this article because our aim is to make clear how the tool and the design-by-doing approach was followed up.

<sup>5</sup>Two regional, public hospitals were involved in the project through an asthma/allergy ward for children and a cardiological ward.

<sup>6</sup>Florence was closely linked to the Nordic research programme SYDPOL (SYstem Development environment and Profession Oriented Languages: 1982-1988), cf., (Kaasbøll 1983).

<sup>7</sup>According to Iivari (1991) most system development approaches still basically have an economical perspective, even if more user-oriented attitudes have been incorporated.

<sup>8</sup>In some decentralised and distributed organisations different departments act so independently that their interrelation has some of the characteristics of the inter-organisational level. We nevertheless find the distinction between the organisational and the inter-organisational level useful.

<sup>9</sup>As advocated in, e.g., (Bangemann *et al.* 1994).

<sup>10</sup>Pursuant to Norwegian legislation distribution of pornographic material is prohibited.

<sup>11</sup>This corresponds with a proposal for influence in a local government by Hales & O'Hara (1993).

<sup>12</sup>Industry based trade unions lose members, professional and academic trade unions get members; in total a small growth of the number of people organised in trade unions (Statistisk årbok 1994). The Collective Resource approach concerns the industry based trade unions, just as the technology related legislation in Norway.

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