

From Utopia to DLK – Management of External Voices in Large Participatory Design Projects

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ABSTRACT

There is a need to extend Participatory design in order to apply it in heterogeneous user groups and large projects of strategic importance for organizations. This study displays an approach to capturing and including relevant external design voices using data from the design of an information system aimed to support the day-to-day tasks of Swedish shop stewards. It was found that shop stewards often use an operative voice, middle level union ombudsmen an organizational voice, and union federation management an ideological one when relating to information technology. An Activity theory analysis showed that the union organization stands at a crossroads, and that the choice of information technology will directly influence the future direction to be taken. It is argued that all parties in a design process must therefore be heard, in order to arrive at system solutions that are actually implemented, used and administrated.

Keywords

Participatory design, trade unions, information systems, Activity theory

INTRODUCTION

It has been argued that the use of Participatory design (PD) thus far has been restricted to small-scale projects in parts of organizations and their immediate user groups, and that the resulting system is of no major strategic value to the organization [1]. The need to overcome the limitations of the approach by adapting it to large, heterogeneous groups, and apply it in design of information technology (IT) applications of organizational importance has been highlighted [2, 1]. In the earliest PD projects, focus was on the individual user's work. Later, areas such as CSCW have used the PD principles for design of systems for team- and intra-organizational work [3]. This demands an approach where all parties affected should be allowed to contribute in the design process.

In *PDC 2000 Proceedings of the Participatory Design Conference*. T. Cherkasky, J. Greenbaum, P. Mambrey, J. K. Pors (Eds.) New York, NY, USA, 28 November - 1 December 2000. CPSR, P.O. Box 717, Palo Alto, CA 94302 cpsr@cpsr.org ISBN 0-9667818-1-3

PD was originally applied in the Scandinavian trade unions in order to realize the good work and secure the interests of workers. In projects like DEMOS and UTOPIA, workers and designers collaborated to design systems that enhanced workers' skills, responsibility and autonomy [4]. In these projects, design work was related to a particular workplace and it was therefore comparatively easy to let user representatives from all affected work groups actively participate. However, the introduction of IT has posed new questions for unions and forced them to expand their technology strategies beyond workplaces. The Swedish Trade Union Federation (LO) intends to IT a tool for the day-to-day work of its shop stewards, by designing an information system that will be implemented in the organization's individual federations [5]. This far-reaching effort puts great demands on PD, which will be used in the design process. While PD may not meet with substantial response in commercial enterprises, it has a natural belonging in non-profit organizations, where democracy and the equal rights of all are fundamental elements. Trade union federations usually have complex structures with many individual federations, hierarchic levels and interest groups. They should all have a say in the design of an information system which will affect their work situation. The design of a system to be implemented in an entire union organization thus provides a great challenge but at the same time possibilities to extend PD.

Aim of Study

The aim of this study is to report practical experiences of how PD can be applied in comprehensive design projects of strategic organizational importance. The specific aim is to explore how data from secondary users can be externally collected, analyzed and thereafter fed back to a PD group. The data collected outside the design group is intended to reflect the voices of those interest groups who are not direct users of the system, but which will still be affected by its implementation. Action design (AD), a systems development method originating from PD is modified to suit the needs emerging from large design projects and heterogeneous user groups [6]. In the study, data from a workshop, participatory observation and interviews at union federation offices are used as concrete examples of how the extended approach is used to collect the external design voices. A macro-level Activity theory

(mAT) model, and a prototype and its future modifications reflecting the additional voices, serve to illustrate the benefits of the approach and the necessity of also involving the interested secondary parties. The major contributions of the study are the experience to be used in large PD projects, and knowledge from the Swedish trade union experience which can be used by other unions wishing to implement IT as a tool for union work.

DLK and the Trade Union Organization

In Sweden, the Trade Union Federation has responded to new challenges, including a fading membership and insufficient traditional training and information resources for shop stewards, by planning to implement IT in large scale in the union organization. This is partly to be achieved by an information system that will be accessible for all shop stewards in LO. The Distance supported learning for Local Knowledge needs project (DLK) is a joint project between researchers and LO. It is intended to be the point of departure for major work on change [5]. In DLK, shop stewards participate in approximately 150 local projects where they are supposed to formulate and support their needs in union work, i.e. replace a traditional top-down with a bottom-up approach. Simultaneously, a group consisting of researchers and users works with an overall design of an information system for shop stewards.

In the design process, PD methods and Action Design are applied. The number of shop stewards in LO is estimated at approximately 240,000, and refers to those who have part-time union assignments, representing their colleagues at ordinary work. They can be found at workplaces and their local club organizations, and sometimes at union sections. Besides the shop stewards, the unions employ ombudsmen, who have full-time union assignments. They are mainly found at union department and federation office level. LO organizes about two million members without union assignments. They are found in 18 individual federations that relate to different occupations and sectors. They sometimes differ substantially from each other in terms of size, work place size, gender representation, and work procedures. Still, the federations share many values, principles and work activities.

Baseline

Initially, six union federations participated in the project. Design work focused on the central LO visions behind the project, and on the needs of shop stewards [5]. Data collection, e.g. a LO policy review and questionnaires to shop stewards, participatory and argumentative design, e.g. in Future workshops, were used to construct a drawing-tool-based paper prototype of the planned information system. The prototype aimed at reflecting the information and communication needs of the shop stewards emerging from the data and PD, while not deviating substantially from LO strategies displayed in the policy review. It was separated into a central LO, federation, department and workplace level. The major facilities provided were a laws and agreements data-

base, a Case database, a discussion forum, a bulletin board, a union training and courses section, and an address book. Most facilities were provided across union boundaries, e.g. making it possible to access negotiation cases from and contact shop stewards in different federations. The discussion forum was further partly accessible for members.

In the second phase of the DLK-project, the number of participating federations increased to 18. In addition, while participants previously had been shop stewards at the workplace level (i.e. the primary users), they now extended to sections and departments. This means that subsequent design work demands that additional interests, federation structures, and hierarchic levels be paid attention to, in order to reach a solution that the entire organization will benefit from. For this purpose, the Action Design system development method was modified. Action Design is built on experiences drawn from the PD approach and uses many of its methods, e.g. Future workshops and scenarios [6]. Its cornerstones are active user participation, representation of all user groups affected by the system, documentation, democratic work procedures, argumentation, and design decision consensus. It has also been applied in similar contexts, i.e. where the system will be restricted to a part of an organization and the group of users is relatively homogeneous [6]. It has, therefore, been comparatively easy to let all affected user groups actively contribute to the design. This now became difficult. Five federations are represented in the group, and the participants come from union local club organizations or sections. Further, LO and project management representatives participate. Nevertheless, it became essential that also those groups not explicitly represented should be able to contribute in the design process. Hence it was decided that design work should take place partly within, partly outside the design group. Work procedures should take the form of a dialogue where data collected is used as input to the design groups' work and feedback.

THEORY AND METHODS

The results from a scenario-based workshop around the prototype, participatory observations and interviews are used as input into a mAT model of union work and suggestions to improve the prototype. The study focuses on full-time ombudsmen and those employed at the union federation offices. The combination of data collection techniques was intended to yield a broad picture of unions and IT.

Activity Theory

In the study, the union community is modeled with respect to work activities, subject, object, instrument, rules, inner contradictions and labor division. The mAT model is used to visualize the system solution. mAT originates mainly from developmental psychology and materialistic sociology, but has also become a tool used in Human-Computer-Interaction (HCI) [7]. One branch with a different origin, sometimes connected to mAT, has its origin in Bakhtin's notion of voice, speech genre and social language, and examines how we engage in dialogue using a voice and language relating

to our nearby context [8]. mAT is structured around activities in which subjects take part most often sharing a common object. An activity can be seen as made up of actions and operations undertaken to reach towards an object. It further involves terms like community, rules, instrument and labor division (Figure 1.) [9]. Objects need not, however, necessarily always be the same for all participants and may undergo changes during the process of an activity. A conflict perspective is thus present. Conflicts can take place either within or between activity systems, and often cause breakdowns. These conflicts are sometimes a consequence of the inner contradictions that exist in all activity systems [10].

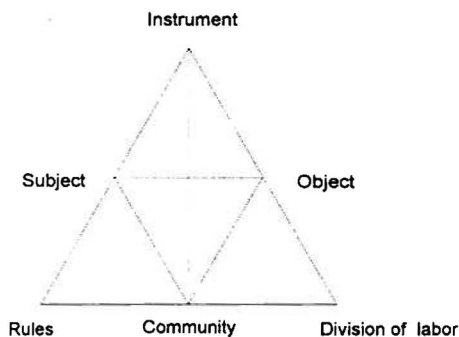


Figure 1. Activity system as modeled by Engeström

When designing information systems, mAT is useful in that it helps when mapping the activities the system is aimed to supporting, and what impact it might have on the social context in which it will be used. mAT seem fruitful for the DLK context, due to its marked multiplicity. The union community consists of several hierarchic levels, groups and work activities that together will be handling an information system. The notion of voices in the design process, division of labor and conflict issues become highly relevant, and mAT a way to structure the prerequisites for and restraints on an information system in the union organization.

Data Collection

The union federation offices take the major bulk of decisions about investment in new technology. The implementation of the information system for shop stewards will ultimately rest with them. Their voice should therefore be considered in the design process. Participatory observation and interviews were undertaken at three union federation offices with full-time employees. Participatory observation leans on the researcher spending time in natural settings and participating in the day-to-day life of the study objects. It can beneficially be combined with and other research methods, for the sake of data triangulation and increased validity [11]. It is advisable to start out with a broad scope, related however to the object of the study. The findings of the initial study inform further inquiry [11]. Observation was initially undertaken at one office (35 hours of observation), and followed by a shorter study at another (20 hours of observation). The obser-

vations were followed up by interviews with a union leader at each office, and an additional interview undertaken at a third federation office. Interviews and observations were recorded on tape transcribed, analyzed, and categorized. The categories were not pre-established but emerged from analyzing the material. The sample chosen was intended to reflect unions of different size and characteristics. One is the largest federation in Sweden, while the others are smaller. Two are typically service sector oriented while the third belongs to industry. Participatory observation was used to see what organizational possibilities and restraints for the implementation of the information system exist in the federation offices. It was felt that it was a proper method to use in DLK since the designers when the project started lacked an overview of the union organization and how it worked. This overall knowledge easily gets lost in design work, where the focus is on daily operative tasks of the shop stewards. The results of the participatory observation can therefore complement and be compared with the knowledge resulting from the work in the design group. The result gained from the initial observation guided further narrowing of scope and focus on questions relevant for the design. The interviews served as a valuable complement to validate the interpretations resulting from the observations.

Presenting users with prototype scenarios is a way of making them reflect upon how the system design will affect their work situation [12]. The ombudsmen at the union departments will be responsible for much of the information system administration and hence form an important group to consider in the design process. The workshop was intended to serve as an additional complement to work in the design group and the participatory observation, in particular to see how an information system designed primarily for the needs of shop stewards can be fitted to be administratively manageable. In a half-day workshop, 22 full-time ombudsmen participated. They were presented with four scenarios from the prototype, related to the case database, the discussion forum, the address book, and facilities for navigating among union courses. In the case database, shop stewards can retrieve information on cases that other shop stewards have submitted, for instance related to settlements with the employer. In the discussion forum, they can discuss union issues with each other and their union members. In the address book they can search for and contact fellow shop stewards. In the on-line course offers, they can navigate among both local and central courses, register, or contact the union folk high schools responsible for them. The ombudsmen were divided into groups of three or four, and asked to reflect upon the scenarios in their role as ombudsmen. In particular, they were asked what they thought was advantageous with the system, and what was considered more problematic. Both positive and negative opinions were taken down on post-it sticker notes. Following this, respectively group was allowed to present its result to the other groups, by sticking the notes on a white board and explaining their contents.

RESULTS

The data collection yielded results that will have an immediate impact on the information system design. The results are divided into a section describing views on the shop stewards' activities from 'external voices', followed by presentation of the impact on the design.

Division of labor

Addressing central management at the federation offices showed that overall labor division in the three federations show substantial similarities. Each is divided into federation office, departments, and local workplace club organizations or workplaces merely having a shop steward representing his or her work colleagues. One of the federations has additional sections above the club level. However, club, section and department size varies significantly among the federations. The departments in two of the federations also enjoy a greater independence than in the third, and are allowed to formulate their own local strategies and activities. The union federation offices are generally speaking divided into an organizational unit, a study unit, an administrative unit, an information/media unit, and a unit responsible for central agreements and negotiations. The division of labor between levels in the federations is hierarchical with clearly defined spheres of action. Shop stewards perform the operative activities at the workplaces including settlements with the employer, and constitute the federations' contact surface to members. The local clubs and sections are intended to support and coordinate this work. Departments have a comprehensive administrative responsibility and handle e.g. union courses, member registration and the unemployment benefit funds. They further deal with negotiations that cannot be settled at the club level. In one federation, the local clubs do not have the right to negotiate. The federation offices perform corresponding activities at central level, but are in addition responsible for the visionary aspect of union work, e.g. formulating long-term strategies and policies, dealing with politics and societal issues, and planning future union activities.

The marked task-divided structure of the federations often causes conflicts between levels and different groups of actors. One found in all three federations was related to communication structure, where sections and departments feel passed over when shop stewards and members turn directly to the federation offices. Likewise, the federation offices become annoyed when they pass on issues to the departments and they are not solved in a timely manner. Moreover, a lack of coordination between central strategies and local-level day-to-day activities was sometimes found. One federation has introduced goal-oriented activities where shop stewards and ombudsmen perform tasks as a way of fulfilling overall goals. However, this has met with resistance from them. When working with daily operative activities, they find it hard to relate to the goals and do not feel as carriers of the organization. Another conflict relates to power structure. Union leaders in two federations acknowledged that they felt their organization has lost support, that the federation office

imposes unwanted constraints on the departments, sections and clubs, and that the employees at the department and federation offices have often become alienated from shop-floor union work. Shop stewards complain that they are ordered what to do by the sections and departments, but that follow-up is missing. They want increased influence over their assignments. This is in its turn related to a major change in the union organization. All federations reported a gradual shift of focus, where it has continually extended to include more aspects of the members' life. For instance, the organizational units at the offices work with soft and cultural questions, and individually targeted training and support. Shop stewards are supposed to be given increased influence over shaping their assignments. This has, however, met with resistance from those wings in the organization who proclaim the more traditional union work centered on laws, negotiations, and all casts in the same mould oriented training. A final conflict relates to shop stewards and members. In one federation, shop stewards report the lack of member interest in union work to be a major problem, while members report that the major reason for them not unionizing is that no shop stewards have informed them.

Information Management

Many problems experienced in union work relate to member recruitment and information. The union organization faces a fading membership. In two of the federations, action has been taken to enhance interest in union issues, by campaigns targeted towards members. A need for a new approach is recognized in order to attract new generations of members. The distribution of information to shop stewards and members is experienced as insufficient. Several informants emphasized how the information that is distributed from the federation offices often gets stuck at the departments or sections, never reaching lower. However, all federations have union magazines that are distributed directly to shop stewards and members.

As regards IT, present information systems do not stretch to the workplace. The three federations are mutually far from each other as regards IT maturity. One has only had e-mail at its office for a year. Another has a variety of systems implemented as an intranet at the office and departments. The departments are allowed to submit information to the intranet, but they must send a copy to the federation office. The third federation has implemented a range of systems both at office, department and section level. However, the sections are only allowed to read contributions, and the departments must have the office scrutinize their contributions before they are accepted. Examples of systems used include member registration, a system for the handling of unemployment benefits, and a study system.

All federations expressed visionary ideas of what IT can do for the union organization, even if only two had an explicit IT policy. Union leaders thought that it will enhance member closeness by reducing response time to their ques-

tions, that discussions with shop stewards and members will be more continuous, and that information will be more targeted towards the individual, avoiding the present paper-based information overload. They further believed that shop stewards will become more able to help themselves, thereby reducing workload on full-time ombudsmen and increase their time for planning and carrying out activities for enhanced union work quality. All leaders had opinions of how an information system aimed to support shop stewards should be designed. It became evident that union work comprises more than negotiations and workplace related matters. It is targeted towards the whole life situation of members and includes working with, for example, cultural issues such as theatre and reading campaigns, insurance and loan offers, ergonomics and computers, and equality of opportunity issues. This is information that the federation offices feel seldom reaches shop stewards and members, and is requested in an information system. One informant pointed out the service aspect. When members and shop stewards turn to their organization they want service as much as simply receiving answers to questions. An information system should therefore also provide tools for accomplishing these tasks, for instance on-line facilities to fill in forms for unemployment benefits. Further, identification with occupation plays a prominent role in union work, with certain issues related to certain occupations. For instance, one federation frequently had to deal with economical crime issues. Many subjects discussed in the shop steward and member magazines relate to different occupational categories. The most IT advanced federation publishes its member magazine on the Internet and in one of the other federations, informants expressed a request that this would be the case in the future.

As for case databases for shop stewards, leaders in two of the federations expressed a hesitation. Not all shop stewards have the right to negotiate and should therefore not be allowed to submit cases. But also when it came to simply gaining experience from others' contributions, they maintained that settlements with the employers do not contain concluding speeches and do not form precedents. They are therefore not suitable to use as learning examples. An exception is verdicts from the Labor Court. The ombudsmen in the workshop, on the other hand, viewed the case database as a complement to more formal information about laws and agreements, which could enforce new angles of approach. But also they feared that shop stewards' own reflection and knowledge retrieval will disappear, resulting in a risk that they uncritically accept poor solutions. The risk was perceived as related to the issue of who has the right to negotiate and submit cases, and what knowledge that person has. They further pointed out that cases may be identifiable if it is explicitly stated who has submitted them, and that sensitive information about members is thereby leaked. On the other hand they found it important to be able to contact the person who has submitted a case. The workshop ombudsmen also emphasized that someone has to sort and structure the cases, and that some kind of restriction

has to be imposed on the system so that it will be manageable.

Communication

Vertical communication in the federations reflects the union organization structure. Members turn to local shop stewards or the workplace club, who turn to the sections and departments and so on. When members or shop stewards turn straight to the federation office, their questions are pushed back to the departments and sections so that no organizational level should feel passed over. Communication by means of IT has reached varying extent in the federations. In the least advanced, the telephone still dominates. The others see a continuous growth of e-mails from shop stewards and members. The most progressive enters all received mail in a diary journal and forward them to the right person. The federation further has a bulletin board for shop stewards and members at its home page. The submissions contain much criticism of the organization; however, the federation office does not meet it. The federation has also carried through projects where it has linked together shop stewards with similar assignments, and let them share experiences in on-line discussion forums. However, all federations emphasize the communicational aspect of IT. They assert that most knowledge is inside the heads of persons, and that discussion forums and abilities to form support networks are indispensable if IT is to enhance learning and unity in the union organization. However, many pointed out the need for IT policies, for instance related to e-mail communication. Members and shop stewards should be guaranteed a response to their inquiries within a certain time. On the other hand, they must be made to include certain information about themselves in a mail. Currently, they often use their employers' computer or hotmail addresses, which makes it impossible to locate the person in question.

As concerns horizontal communication and collaboration across federation boundaries, it takes place infrequently and is most often restricted to federation office level. However, all federations pointed out the benefits of increased collaboration. One leader argued that the loosening of federation boundaries is inevitable, and that IT can be used to speed up this development. Many issues and much information are shared by most federations, and should gain from being discussed and distributed between them. An exception is agreements, who many pointed out vary by federation and locally. Agreements and case databases should therefore be different for each federation. Finally, several informants argued that some federations show great similarities, while others have a more conflictive relationship. This should be kept in mind when forming cross-union support networks and information facilities.

In the workshop, perceived positive aspects of the discussion forum concerned its time- and place- independent availability that can be used to reach new member groups, and increase

the openness and member closeness in the organization. Negative aspects concerned infringed democracy since only those having access to computers will be able to participate in the debate, and the risk that people will be afraid to submit sensitive contributions which will inhibit distribution of information. On the other hand, the ombudsmen felt that people's privacy can be violated if unrestricted distribution takes place. They thus requested the establishment of ethical rules in relation to the forum.

The address book was more negatively received. Even if it was deemed as increasing efficiency and knowledge transfer among shop stewards, most ombudsmen agreed that spending the effort would be wasted time. The limited registration of shop stewards that exists today is cumbersome to administer, in particular where turnover is high. Instead, it was suggested that the address book should be voluntary, with up-dates being performed by the individual. For instance, the departments can provide subscriptions where shop stewards are automatically reminded to up-date their data if they do not wish to be removed. Another suggestion was that the address book should only contain information about the union departments and their contact persons, i.e. be restricted to full time ombudsmen and vertical communication in the organization. Further discussion concentrated on integrity issues and possible mail overload, and on who should have access to the book. It was also requested that the address book provide search facilities for functions and areas of interests, so that people with similar assignments will be able to contact each other.

Training

The federations collaborate with central LO for certain courses. Others are more specific for the federations. Different levels often organize different kinds of courses and target groups. In one federation, the sections are responsible for member courses, the departments for shop steward courses, and the federation office for training the departmental full-time ombudsmen. The ongoing shift in the union organization is also reflected in training. While course content has traditionally essentially been the same for everyone and centered on labor legislation, all three federations attempt to make it more local and individual oriented. In one federation, an inventory of local needs in union work is being performed, and intended to direct a new training structure. The others experiment with letting members and shop stewards themselves define their needs for training and individually design their courses. In one, the goal is that every member should have an individual study plan. The training has an extended scope and covers the whole life situation of members and shop stewards, and development of their personal competence. Examples include leadership training, argumentation techniques and stress handling, but also courses that fall completely outside work life, for instance helping someone to take a sports qualification. Two of the federations are trying distance education, where personal contact seminars, compu-

ter-supported take-home assignments and on-line discussions of course tasks are included.

In the workshop, the training-related scenario mostly received appraisal, e.g. in that offering courses on-line will attract new member groups, and that collaboration across unions will increase. However, many commented on *administrative and organizational issues*, in particular as regards on-line course registration. It was argued that the work situation of ombudsmen is enhanced if shop stewards and members can register for courses themselves. *On the other hand*, this means that the ombudsmen will become less in control of who attends what courses. Since courses cannot be offered to everyone, it was suggested that shop stewards and members have access to course offers and can make on-line notifications of interest. These are automatically sent to study ombudsmen at the departments who take the decision on registration. Some thought that overall accessibility should be restricted to study ombudsmen. Further, it was argued that course offers should be accessible across federation boundaries but registration take place under respective federation. Another issue was whether administration should take place at department or federation office level.

The System Design in a mAT Perspective

An overall observation is that union leaders at the federation offices often used an ideological voice when they discussed the system and IT in general. They based their statements on what constitutes the essence of union work, and how IT can be used to enhance it and shop stewards' and members' closeness to the organization. On the other hand, the ideological references used sometimes stood in logical conflicts with each other. Meanwhile, the ombudsmen related much of their assessment of the prototype to organizational and administrative issues e.g. related to up-dates, privacy and security. If choosing to use the notion of voice, union leaders and ombudsmen can thus be said to bring the *ideological* and the *organizational* voice respectively into the design. Previous design work had focused on the needs of the shop stewards who carry out the shop-floor day-to-day union work and can be described as the *operative voice* in design. Together these voices inform modeling of the union community, its work activities, subject, object, instruments, rules, and division of labor (figure 2).

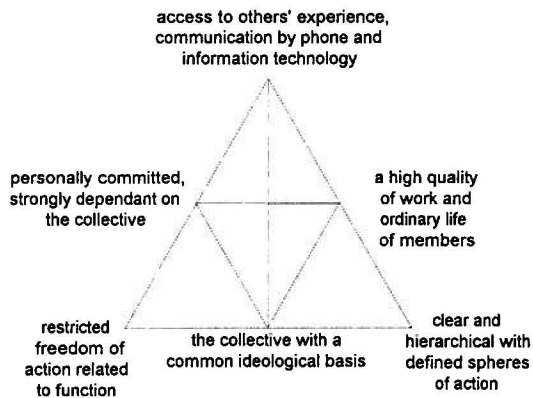


Figure 2. Model of Union Community

The overall activity system constituting union work can be divided into several sub-systems, which are related to the function each level has in the union organization. At shop-floor level, shop stewards are responsible for the day-to-day activities directed towards members. Actions performed include conflict-solving, local negotiations, information and argumentation. Sections and departments have more coordinating and administrative functions, including tasks like course administration and handling of unemployment benefits. The federation offices have an additional function of carrying out overall ideology and the strategic planning activities the organization needs to achieve long-term goals.

The union work activity system includes a major inner contradiction, which becomes obvious when looking at the partly ambiguous model above. The union organization is founded on an ideological basis in which the collective, democracy and the equal value of all play prominent parts. At the same time it has a profound hierarchical structure, where freedom of action increases with advancement of level. This structure is also reproduced in IT applications, where the workplace level is currently left out, and access to and the right to handle information in the systems increase with higher levels. Since different levels, and also the units at these levels, have different spheres of actions and since communication between them is perceived as insufficient conflicts are inevitable (Table 1).

WITHIN ACTIVITY SYSTEMS / SAME LEVEL	BETWEEN ACTIVITY SYSTEMS / DIFFERENT LEVELS
Workplace disputes / total life-world of members	Goal-oriented activities / day-to-day operative tasks
Formal questions / soft issues	Departments and sections passed over / federation offices feel they do not fulfill their duties
	Superficial equity and solidarity / power structures and alienated full-time ombudsmen
	Shop stewards' view on indifferent members / members without information on unions
	Leaders and ombudsmen like idea of shop stewards helping themselves / simultaneous fear of losing control

Table 1. Conflicts in union work

Modified Prototype

The Swedish union organization is presently going through fundamental changes as regards work procedures and view on its members. They can either be reinforced or counteracted, depending on what information system solution is implemented. For future design, it is important to pay attention to the changes, while not designing applications that the federations will not implement since they are impossible to administrate or conflict too radically with inherent power structures. Based on the study results, the following design decisions were made.

New information and services: Information and services oriented towards the whole life situation of shop stewards and members will be included. This is the kind of information that the federation offices feel seldom reaches all the way down to the shop stewards who thereby cannot inform members. It might be argued that shop stewards themselves have not requested this information. On the other hand, the reason may be just that they have insufficient knowledge that it exists.

Policies: Merely delivering a design of an information system to the federations seem insufficient. In addition, policies and recommendations on how the use the system are needed in order to overcome unwanted effects, e.g. when shop stewards and members ask for help using an unidentifiable e-mail

address.

Case database: Both ombudsmen and leaders expressed hesitation since the cases do not form precedents and might constitute bad examples. However, the hesitation may also be an expression of fear of losing control over the shop stewards. It is rather unlikely that someone with experience from negotiations will submit examples of bad outcomes for the union part, without explicitly stating that it is a warning example. Thus, the case database will also be included in the modified prototype, but the right to submit cases limited with those with the right to negotiate.

Address book: The recommendations from the ombudsmen will be followed in part. The shop stewards will be responsible for registering themselves on a voluntary basis, since letting registration rest with the departments seems too resource demanding. On the other hand, the idea of restricting the address book to contain addresses only to the ombudsmen is rejected. This would probably conserve existing power structures and eliminate the gains of the exchange of experience between shop stewards. The address book contains facilities to form support networks and occupation will constitute a search category.

Discussion forum: The discussion forum will basically remain in its present form. There seems to be an agreement at all levels that communication and exchange of experience are the most important source of knowledge in the union organization. Facilities for discussing issues related to occupation will also be added in the discussion forum.

Training: The present design will be extended into one where shop stewards and members can send on-line notifications of interest to study ombudsmen who then handle the registration. Registration will take place within each respective federation, while one should be able to view courses and contact persons in other federations as well. It is important that the shift in focus towards more individually-targeted training is reflected in the course content. One idea is that shop stewards and members are provided fill-in forms where they can formulate their needs for training. The form is sent to study ombudsmen who can then support creating individual study plans.

DISCUSSION

In the study, the ombudsmen often used an organizational voice and the union leaders an ideological one. It can be argued that the workshop had a narrower focus than the participatory observation and interviews, and that this can have affected the voices. Nevertheless, they provided knowledge on a broad range of aspects of union work. Together with the previously explored operative voice of the shop stewards, they provide a basis from which to continue design work. It might be argued that there are tensions between meeting the needs of shop stewards and having the design process so heavily influenced by ombudsmen and union leaders. It should therefore be stressed that the needs of shop stew-

ards have been and will be the major focus in design work. The original intention behind PD was to empower otherwise neglected voices and to let immediate users actively participate in the design process [13]. This aspect must not be lost. Hence, shop stewards will participate in evaluating and modifying all design decisions. However, their needs must be met in a way that is organizationally and administratively feasible. Especially the ombudsmen have valuable knowledge of administration routines and the present handling of registration and documentation that shop stewards may not have come into contact with. If the voice of shop stewards is complemented with others, it is easier to arrive at system solutions that support user needs, that can be administered, and that meet the culture and goals of the organization. Then, the chances that the system is actually implemented, maintained and used are greatly enhanced.

Bringing in the Voices

The design and integration of comprehensive systems in organizations is a complex task, involving multiple interest groups, potential conflicts, and a range of issues to be solved [14]. While PD has previously often focused on individual users [e.g. 15], a more accentuated organizational approach may be its future challenge and advantage. If it is to be applied in large, heterogeneous organizations and in strategically important projects, it has to be extended to incorporate all the affected voices. This is not only important because it reflects PD's democratic values, but also because it helps to foresee consequences of different design solutions and thereby chose those that offer the greatest benefit to the entire organization. Particularly in non-profit organizations, where democratic values are central and where all users of an information system can be said to be its owners, bringing in the voices is essential. It has been claimed that the design of inter-organizational systems can be the new challenge for PD [16]. In this study, the federations showed substantial similarities as regards structure and direction. The major difference was in the maturity level of their IT. Still, the frequent requests for cross-union boundary collaboration imply that the information system will have an inter-organizational character that needs to be focused on in future design. To bring in the voices in inter-organizational design work becomes even more important, since unsolved conflicts may result in systems being counteracted or not used by the neglected organizations [16].

Macro-level Activity Theory

Activity theory has been used in systems development as a way of modeling pre-requisites for and consequences of implementing information systems in organizations [7]. In the study, the approach was found fruitful since it helped to summarize the disparate voices of the union organization, by structuring the basic activities in union work, its inner contradictions and conflicts. What became particularly evident was that while union leaders often spoke in ideological terms about increased individuality and scope of action for shop stewards and members, both ombudsmen and leaders ren-

dered visible power structures and expressed hesitation in letting shop stewards access certain information. This informed design decisions and visualized the potential power that IT has to transform the organization in one direction or the other. Existing power structures or the major shift of focus in union work may be directly built into and thereby reinforced by the information system.

Designing for Work on Change

The introduction of IT often causes major changes in organizations. Hierarchic levels may be removed, power structures among actors changed, some tasks rendered obsolete and others emerge [17]. Union organizations worldwide have in recent years faced increasing difficulties in attracting members and retaining their power [18]. LO has responded to these challenges by introducing new concepts and ways of working. The focus on the work situation of shop stewards and members has extended to include their total life and increased individuality and independence. Meanwhile, the partial movement away from traditional union values has caused conflicts within the own organization. The Swedish Trade Union Federation currently stands at a crossroads. The design of an information system to support union work will have a major influence on what road is taken.

The design decisions reflect the striving for work on change in LO. For instance, the aim has been to increase shop steward independence by improving possibilities for horizontal and cross-union communication. Further, the original LO intention behind the information system was that it should be used by shop stewards exclusively. Previous design work focusing on shop stewards has however shown that keeping members completely outside the system will not result in optimally improved union work quality. The study reinforces these findings. The day-to-day work of shop stewards is so intimately connected to members and the need for improved communication so substantial that designing IT that diverges rather than unifies the parties seems foolish. For this reason, some of the facilities in the system are accessible also for members. Future design work will further investigate where it is suitable to integrate services for members and shop stewards and which applications should be accessible by shop stewards only. Meanwhile, the attempt has been made to achieve design solutions that can be administrated and which do not break too radically with the power structure and division of labor still prevalent in union work. In other words, the aim has been to strike a balance between visionary and realistic solutions. Nevertheless, if the information system is implemented, it will indisputably result in fundamental changes, including redistribution of power, roles and division of labor. The subjects in this study also recognized this. Many thought that as members and shop stewards become more knowledgeable, their own need to take urgent measures will decrease and leave time for overall planning activities. They further saw themselves abandoning the role of direct advisors and instead playing the role of coordinators and supervisors

when shop stewards and members help each other on-line. On the other hand they also recognized a need for combining overall union and IT competence, and some expressed fear that certain functions higher up in the union organization will become obsolete. In one federation this had already happened as lower levels contacted leaders at the federation office directly by e-mail, ignoring traditional contact methods via the diary.

To Extend Participatory Design

In large scale PD-projects it becomes impossible to let all affected parties actively participate in a design group and its work. A possible approach is to partially move outside the immediate group, to collect data from other sources and let internally and externally performed design work engage in a continuous dialogue. In this way, all voices are heard and different perspectives taken in, enhancing the chance of a sound basis for design. Moreover, active participants become reactors and evaluators in addition to their role as active designers. In the DLK-project, subsequent design work will have its focus in the Action design group. Its assessment on the results of the participatory observation and workshop scenarios will primarily take the form of testing and evaluating the up-dated prototype. The work in the design group will, however, be complemented by additional prototype evaluations, involving additional shop stewards, federations and interest groups, for instance members. It is thereby hoped that these parties will also have a say in the design process.

CONCLUSION

Participatory design has most often been applied in small-scale projects restricted to parts of organizations and to relatively homogeneous user groups. It has been argued that it has to be extended to be applicable in large projects of strategic importance for organizations. This study reported on the design of an information system aimed to support the day-to day work of the Swedish Trade Union Federation's shop stewards. Here, design partly takes place within, partly outside the immediate design group in a continuous dialogue. In the study, externally collected data were analyzed in the theoretical framework of Activity theory, in order to visualize the different voices in the design process. It was found that ombudsmen at union departments spoke in an organizational voice, while those employed at the federation offices often used ideological terms when they related to IT. Both voices will have an impact on design decisions and result in a modified prototype. At the same time, the union organization has a hierarchical structure with clearly defined spears of action and inherent conflicts. Both ombudsmen and union leaders implicitly expressed fear of IT making them lose power to shop stewards and members. LO is currently undergoing a major shift, where the previous focus on work life is extended to include the whole life and increased independence for shop stewards and members. The choice of information system solutions will have a direct impact on the future direction of the union organization. It is thus essential that all the voices

in design are represented in order to arrive at a system solution that is actually implemented, administrated and used. Future design work will be an iterative process aimed at bringing in further voices. However the needs and opinions of shop stewards, the immediate users, will remain the primary focus.

ACKNOWLEDGMENTS

This study was financed by the Swedish Foundation for Knowledge and Competence Development (KK-stiftelsen).

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