

Female Interests in the Design of Technology Supported Work Systems as Exemplified in the Bremen Administration

Gabriele Winker

Computing Centre of the Bremen Administration, Germany

1. Introduction

In our society, the possibilities and opportunities to participate in the creation of certain social spaces are determined not least on the basis of gender (see on this also Beer 1990). The reasons for this can be found in the gender-specific division of labour. Women are allocated unpaid reproductive work and that of low-paid employment and jobs on the lower steps of the hierarchical ladder. Ursula Rabe-Kleberg was right in saying that women have no choice but to accept the jobs left-over by men (see Rabe-Kleberg 1987). Technical areas are claimed by men with the result that women's experience of life has had little influence on the development and application of information technology.

Nevertheless, both the National Union of Employers' Associations and Rita Süßmuth during her time as Minister for Women's Affairs wrote euphorically about the opportunities that new technologies would bring with them of a breaking down of the traditional barrier between male and female jobs in the working world. In view of the increasing automation of work that was previously performed manually, women's work could also be upgraded (see Süßmuth 1986).

This is a technologically determined argument neglecting the reasons for gender-specific division of labour. I would like to emphasize this by pointing out an example of how the working conditions of typing staff changed as a result of the introduction of information technology. Taking the example of the Bremen administration, it can be shown that positive opportunities for women do not occur as a matter of course. Although good conditions have been created, the application of information technology doesn't lead to better working conditions for women, but on the contrary to worse.

At the same time it can be shown, however, that the general conditions in the Bremen administration can be used by women in their own interests. Women don't have to remain as on-lookers while their work-places, most particularly in the secretarial and clerical areas, become more de-skilled and are subjected to additional stress as a result. Women can act in their own interests if they enter into social spaces usually

reserved for men. I would like to present some first attempts to design technologically supported work systems in women's interests.

2. Point of Departure at the Bremen Administration

The Bremen administration are attempting to achieve an acceptable compromise for employers and employees between rationalization and socially acceptable technology design. The stated political aim, besides increasing administrative efficiency, is also to improve the working conditions for the staff and services for the public. The introduction of technology takes place in accordance with a formal agreement between the management and the employee's representative about work conditions favourable to the employees. Scientific findings on work have been incorporated in it. With the help of this agreement not only the negative consequences of the introduction of technology can be avoided, but also the creation of more humane working conditions can be supported. The typing jobs mainly held by women should be reorganized into upgraded mixed-work offices. In order to provide the accompanying qualifications for all concerned, an extensive advisory and training system was set up. For more than three years I have been working with the academic staff involved with the drawing up and realizing of this advisory program.

3. Discrepancy between Demand and Reality

In the following, the aims described in the agreement are briefly listed and then the problems which occur in reality are presented.

Demand:

According to the agreement covering the introduction of computers at the work-place, staff should get better working conditions. In order to achieve that aim it is necessary:

- to remove routine work and to enrich work content;
- to increase the scope for action of the individual staff members;
- to remove hierarchical-bureaucratic principles in the organizational structure so that an all-round understanding of work tasks can be achieved.

For the typing staff these goals require the setting up of mixed-work offices, by 1991 at the latest. This means that upgraded clerical tasks have to be allotted to typists so that they are only required to type approximately half the time for their superiors. This also applies for part-time staff. As a consequence, the personal computers can only be used when skilled administrative tasks are included besides typing (upgraded mixed work) and activities without the use of a visual display unit (vdu) are guaranteed (load reduction). This regulation has to do not only with humane considerations, but also with medium term expectations that clerical workers will do much of their writing directly using their PC.

Furthermore, the active participation of the staff in the design of their work-place and working conditions has been laid down in the agreement.

Reality:

The translation of the outlined aims to practice is another matter. As a rule, important meetings are attended by personnel representatives and not by the members of staff directly involved. Project groups on the preparation of the use of technology are exceptions and are dominated by administration management. This prevents an equal participation of those involved, particularly when they are at the bottom level of the hierarchy, as are typists.

Despite verbal emphasis of the necessity of a comprehensive organizational design, up to now hardly any changes in the organizational structure have been planned or carried out. It doesn't promote a structure of organizations where decisions are decentralized and doesn't assign more responsibilities to lower level functions. There has been verbal agreement on mixed-work offices, but hardly any typing pool has been reorganized as an upgraded mixed-work office in connection with the introduction of technology. The use of word processing doesn't make typing easier, it leads instead to a dramatically increased amount of changes because the manuscripts received by secretaries are less well-prepared than formerly. A document is revised several times before the final draft is complete. This reality of up to eight hours of typing in front of a VDU results in greater physical and mental strain than did the conventional working with a typewriter. Even the ten minutes break after fifty minutes work as laid down in the agreement are often not adhered to. There are complaints about eye strain, neck and back tension and also about difficulties in turning-off after the days work.

Moreover, this type of use of word processing, instead of eliminating fragmented work and qualifying the typists, leads to the creation of hierarchies by introducing coordinator positions. These coordinators and system administrators prepare textblocks, form letters or macros and set up address and batch files. The writing staff put them together or fill out forms on the PC, an activity which results in de-skilling the typists' job. 90 % of coordinators are male although at the onset their training is the same as that of the typing staff. This, alongside men's self confidence and their greater ability to stand up for themselves, can be explained by the automatic and unquestioned attributing of technical competence to them.

In summary, it can be stated that the working conditions of the typing staff at the Bremen administration have not improved, and for some have even degraded. Moreover, there is a danger that the more the clerical staff learn to use the PC as a standard office tool, the more the typing staff becomes superfluous. The already described discrepancy between aim and reality in the process of introducing technology is to the detriment of the weakest - to the detriment of the employees in the typing area.

By the introduction of information technology the newly constructed task of coordinators in the departments are allotted according to the gender-specific hierarchies of work structures. Accordingly, higher-valued preparatory work tasks including programming on a smaller scale are generally assigned to men. Their work

content is improved, resulting in upgrading of skills. This causes a polarisation, resulting anew in a gender-specific disadvantaging of women. The creation of a new hierarchical level has negative consequences for the efficiency and quality of service in the public administration.

The stated goals of reducing work load and improving services have not been achieved. The same results are being produced with more personnel and higher technical costs. In practice, there is little mention of the aim of improving services for the public, let alone any work being done to meet this aim.

4. Reasons for the Reconstruction of Gender Relations through Information Technology

The example of the Bremen administration shows that, in spite of extensive scope to do otherwise, the use of information technology leads as a rule to the reproduction and production of sex-segregation at work with women at the lower levels of the hierarchy.

Reasons for this are to be found in technology-centred introduction strategies of information technology and the absence of humane work design. Behind the technology-centred approach is a mechanized world view where computers, carrying out on a machine the brain work of the human, are superior to people. In practice this means that the technically possible is realized without question. Only those activities that cannot be automated are assigned to people. Faced with this, there is no question as to whether certain parts of work tasks would be more meaningful for people to carry out instead of machines.

This technology-centred approach implies that there are no planned social and organizational changes in work structure. Instead, people have to adapt to changed work procedures which occur as a result of the introduction of the machine. Neither vertical nor horizontal division of labour is questioned in the process of introducing technology. As a result of this, the old structures tend to harden rather than to dissolve. The regulation in the agreement providing for the integration of word processing with upgraded clerical tasks is not taking place. As a result, the gender-specific hierarchies in the division of labour remain. This is in the interest of the management with relatively little competence and the better paid clerical employees because the fight for the remaining qualified clerical posts after the introduction of technology is already hard enough (see Baethge/Overbeck 1986). Furthermore, they are not interested in a levelling of hierarchies, because this would remove their position of power over the female typists.

The massive stereotyping of the sexes is supporting this reproduction of gender relations. The supposedly female characteristics such as sensitivity, intuitivity, empathy and others are assigned to the women. Moreover, a certain domestic competence is ascribed to them, but characteristics associated with the public area and with technology and power are withheld from them. On the other hand, men are

ascribed technology-related skills and ability without question. Cynthia Cockburn sees this association and separation of men and women into the categories of maleness and femaleness as a powerful cultural process (see Cockburn 1989). For, as a result of their supposed technical competence, men secure for themselves skilled and higher valued work and they secure power for themselves so that they are able to decide about the tasks allotted to women.

5. First Approaches towards Work and Technology Design in the Interests of Women

Information technology contributes to the continued existence of sex-segregation and male domination. But it can also be used in different ways, so it must be possible to design technology supported work systems in the interests of, and from the perspective of women. In the following I would like to present some first ideas on how to do it.

5.1. Women's Influence on the Design Process

The main prerequisite for women to influence the design process in their own interest is for them to have total participation. Technology supported work systems must be designed in cooperation with the users and computer experts. The future user must be able to contribute with her knowledge and individual talents and ideas. She has to be included more than previously in the development and translation of alternative approaches to task and technology design. For this, comprehensive measures for training are needed. The traditional structure of staff representation must be supplemented by new forms of direct participation and co-determination at the workplace.

The first positive feedback in Bremen is with women's groups in which women talk, during working hours, about their problems with their present jobs and the new technologies. Women do not reject the word-processors but they have contradictory experiences (see Wagner 1985). They enjoy learning new skills. They feel that computers could improve their job conditions. Their attitude is not directed against technology in general, but rather they object to the way technology has been implemented and the way their superiors expect it to be used. They perceive computerization as a process directed by experts upon which they have only marginal influence. In the workshops women learn together how to handle the PC's without male experts. They express their wishes about changed working conditions and talk about strategies to achieve these aims. Positive examples are discussed. In these groups a practice of communication among individuals is made possible. Instead of isolated individual coping routines - "no one listens to me anyway!" - new ways of dealing with the situation arise when there is reason to hope that colleagues support a more humane reorganization of work. Methods used to support this are, amongst others, the Future Workshop (see Jungk 1981).

Mixed-gender project groups can also be used for the interests of women. However, it is my opinion that they are only suitable for the groups that are still disadvantaged, as are the typing staff, when an outside speaker ensures that all interests are given room and that the usual hierarchical principles working within the group are uncovered. Only then can a social process of cooperation of all those affected take place. In the course of this process the conflicting interests of management, clerical staff and typing staff are also brought to the surface and articulated openly. In order to prevent underprivileged groups from being overshadowed, the power of veto should be granted them.

For the software development process there are already methods based on ideas of the cooperation of computer experts and users (for example, see Reisin 1989, Falck 1989). In contrast to the linear phase model, these methods support a step-by-step, cyclical technology development. In this way, the future user has the possibility of repeatedly including her material, social and subjective demands based on individual experiences into the technology system.

For this, it is important to have committed female computer scientists, work scientists and work psychologists to monitor the process of reorganization in the interests of women. A computer scientist or work scientist does not design work-places oriented to women's interests qua her gender. The main prerequisite is mutual interest on the part of the computer experts and future users that the users should be able to determine their own working and living conditions and thereby contribute to the elimination of the discrimination against women. It is also important that computer scientists do not design offices in the supposed interests of women, but instead should design offices in cooperation with women.

It is necessary to create conditions so that the female workers can voice their ideas. In reality, the scientists have to adopt a moderating role in which their responsibility is to create an open atmosphere. It is therefore important that they reflect on their own positions, their own values, and that they are capable of entering into the communication process between "interlocking unfamiliarities" (Becker-Schmidt 1984). Women do not only experience the same discrimination because of gender, but they also have different class-specific living conditions, as well as varied individual experiences and socialization. The aim cannot be a standardization or a one-sided definition of women's interest, but the manifold perceptions of reality and the resulting varied and different wishes for action in the work process on the part of women must be taken into consideration.

5.2. Design of Working Conditions Favourable to Personality Development

It is becoming clearer nowadays that the introduction of information technology does not only provide a new tool at the work-place, but that it leads to an extensive new distribution of work-places, hierarchies and skills. Within this framework the allocation of monotonous work and low-paid left-over tasks to women has to be stopped. In women's work-places, it is important to improve task-content, to ensure a

comprehensive understanding of tasks, to widen the scope for action and decision-making and to eliminate unnecessary hierarchical principles. More detail is given about this in the discussion on work design favourable to personality development. Therefore, it is necessary that already existing ideas on the design of work organization are translated into practice as in the creation of upgraded mixed-work offices or semi-autonomous groups.

In the course of this, it must be ensured that the work already performed by women is given social recognition. Behind the stereotyping of the good female spirit in the office valuable aspects of women's work are often hidden (see Goodman/Perby and Lie/Rasmussen 1985) which do not appear in job descriptions, let alone being paid for e.g.

- activities of an atmosphere creating nature, as in the socially competent upkeep of the working climate;
- ensuring uninterrupted working phases for management - resulting in continued interruption of their own work performance;
- silent correcting of typing and stylistic mistakes in dictation.

In order to achieve task restructuring, it is necessary to consider the tasks of all members of staff of the entire administrative unit and not only individual work-places. In this process, it is necessary to examine the existing processes of communication and cooperation and, if necessary, to change them.

This always causes conflicts between interest groups owing to the fact that male privileges will have to be relinquished. The image men have of themselves increases in value by virtue of their power to designate supporting work to females. It is here that work scientists and system developers should take a clear stand favouring women at the lower positions of the hierarchy. This is one of the reasons why I am offering the above-mentioned workshops for women on a regular basis where questions relating to work organization and techniques can be discussed. Here women discover that they are not alone with their problems at the work-place but that other colleagues share their experiences. The outcome of these meetings are suggestions on task design and new possibilities for action. Moreover, in the Bremen administration, courses in self-assertiveness for women are organized in order to strengthen women's self-confidence and support them in their effort to have their voice heard. Both courses have been successful.

5.3. Orientation to Social and Individual Needs

When designing technology supported work systems, very little attention is given to the question of how the quality of products and services change as a result of the use of information technology. Little account is taken of how people adopt a product and which strategies and modes of behaviour they assume in order to handle a technical product. Further, there is little discussion on the existence of alternative design possibilities which could support an improvement in products and services.

Work and technology-orientated design in the interests of women should not only consider conditions at work. Questions must be asked about the usefulness of products, in terms of if and to what extent they are socially and individually desirable. The question concerning the usefulness of products and services is of central importance to women who carry the main burden of reproduction and the meeting of the family's needs. Needs are often perceived as individual because of the closed nature of the family. The private nature of consumption, and the degree to which these needs are met are considered by the women as their own personal success or failure. By putting the question of needs and the meeting of these needs into the discussion on work and technology design, they lose their individual character.

This means that not only existing tasks should be re-organized, but also new tasks and public services increasingly be included into considerations dealing with work and technology design. Taking account of women's interests would mean, for the public administration, longer opening hours, shorter channels, direct decisions, comprehensive advice on the spot. It also necessitates a specific technology design. This requires answering a whole series of questions of a technical and organizational nature. How is data entry possible at all while simultaneously giving advice to the public? How can all the relevant data be at hand for notifications and answering questions without evading the data protection regulations?

5.4. Questioning the Myth of the Machine

Often, behind the technology-centred approach with its dream of the machine as being better than the human, lies the difficulty of coming to terms with one's own life and feelings. Erich Fromm wrote aptly in reference to this: "One cannot help being suspicious that often the attraction of the computer-man idea is the expression of a flight from life and from humane experience into the mechanical and purely cerebral." (Fromm 1968, p. 43) This is apparent with the obsessed programmers and computer specialists who flee from the threatening reality of the everyday into the machine world - their ideal world.

Many of the male coordinators who look for their solutions in quicker and better technology behave in a manner like this. They are seldom interested in task criticisms and work re-design. Their approach to the process of reorganization is too technology-centred. Therefore, the current function of coordinators at the Bremen administration should be put into question. It is not necessary for programming to be carried out independent of the area of application, but technology is needed to support real tasks. For that reason, task-related skilling and regular workshops have been introduced at the Bremen administration. This is an attempt to enable users to be in the position to develop systems for their own specific task with the aid of the PCs standard software, and to adapt the user interface to their own style of working. First experiences show that, given enough free time and support, the users are motivated to design their own work procedures and tools. In this way there is a better chance that the results are not technology-centred but in line with practical demands.

The abstract fascination for technology and for removing oneself from the everyday life is more prevalent among men than among women. Firstly, this has to do with the lack of access for women to a life in a purely machine world. The work-load of the typing staff, for example, is so high that there is no time available for them to become exclusively technical experts. Secondly, it appears to me that women feel a certain ambivalence between the desire to reach for the heights, to transcend reality and to enter the realm of abstraction on the one hand, and their own rootedness in reality on the other hand. By saying this I do not wish to imply the existence of a particular type of "female thinking" or "female thought processes". There are contradictions felt by women in these ambivalent experiences, in the sense that they find themselves as wanderers between the different life-spheres. Above that, they have to fulfil the male-oriented demands of the job and, at the same time, to perform it according to the female ideal. These ambivalences felt by women do not lead to a homogeneous "female thinking", but can, depending on the personal and social situation of the respective women, lead to different solutions. However, the way women cope with these contradictions can provide a starting point for a human-centred technology design. As a type of wanderer, as someone responsible for varying life-spheres, it is important for women to become consciously aware of the contradicting demands resulting from abstract constructions and social arrangements and to use them productively for the creation of a humane working and cultural world.

5.5. Breaking Through the Stereotyping Femininity versus Masculinity

Although sex-segregation generally hardens as a result of the introduction of information technology, the allocation of the traditional stereotypes and the association with men of all things technical is still being questioned. By using data processing as an enabling technology, the physical work of the "male" manual worker already fades into the background, concomitant with the computerization of the strictly logical, calculable and presumed "male" tasks. Left over are activities requiring intuition, creativity and universal thinking, characteristics usually more associated with women (see Schelhowe 1989).

Thus, an attempt has been made within women's studies in discussions on women's different approach to technology, to concentrate on the stereotype femininity versus masculinity and to re-evaluate positively the characteristics associated with women. I see this scientific and political direction as being problematical for the following reasons:

1. The stereotype femininity versus masculinity, though pervasive, varies according to the content. Depending on the context and the line of argumentation used, women are assigned the most varied and different characteristics (see Cockburn 1988). The characteristics attributed to women are, as a rule, used to maintain the hierarchical differences between men and women. Stereotyping serves to differentiate and separate the sexes.

2. It is questionable whether women, in view of their responsibility for reproduction, also do in fact orientate towards human needs and social connections in the occupational sphere. If women in the private sphere in the family actually learn specific abilities as, for example, sensitivity, this does not mean that women correspondingly behave in this way in every situation.

For these reasons, it is not meaningful to discuss a re-evaluation of the presumed feminine characteristics. On the contrary, women should not allow themselves to come to terms with the computer in the manner ascribed to them. This applies all the more in view of the fact that the discussion on the gender-related different approaches to technology ascribe to women partly contradictory characteristics. While Sherry Turkle describes the soft female programming style as being creative, intuitive and non-rule oriented, Christiane Schiersmann associates women with an applications-related, planning approach to the computer. Both aspects are important. They have to be unified in the everyday handling of the computer. It is my opinion that, depending on the task and individual preference, a planning approach to the computer for the solving of technical tasks and the qualifying of women is just as important as experimenting and learning by doing.

Women are not left unscathed by the many attributes given them which keep them out of the world of technology. "Men perform heroic deeds in the machine world and use half their working time to solve the question of whose fault it is if things don't run smoothly; where then is my place left" asks a female employee. The aim of the earlier mentioned self-assertiveness training for women is to prevent the outside definition from becoming a self-definition, and for women to take seriously their own wishes in the designing of work and technology. The focal point is the bridging of the discrepancy between what is thought about women, how women see themselves and what they actually learn and do by using technology. Women begin to question this stereotyping critically and to recognize its function in maintaining power difference between the sexes. They can analyse together how they are forever assigned to those work-places in society that are unattractive to men based on the most manifold arguments. In one breath, being reminded of their special skill at the secretarial level on the one hand, and of their lacking aptitude for clerical tasks on the other, women are refused upgraded tasks. Or similarly, while they are questioned about the function of word processing, technical competence is being denied them. Women together recognize the flexible and, at times, contradictory arguments brought forward to preserve the difference between men and women. They see how women are kept at a distance from technology and the power linked to it, and this awareness, as Christine Roloff put it, can be a motor for change (see Roloff 1989).

6. Outlook

It is not possible to put forward concrete suggestions on design, but only to indicate some possible directions. However, feminist work and technology design is not well liked. The yardstick is always reality; to what extent a portion of gender-specific

discrimination can be eliminated and the extent to which the opportunity for each individual to act can be increased.

There is no doubt that women could act as subjects with the type of work and technology design described here. The socialization of gender is a contradictory process. It does not lead only to adaptation, for within it is also a portion of resistance. Action on the part of women changes when, in one form or other, they experience a change in their opportunities for action (see Knapp 1989).

Qualified co-determination regarding their own working conditions can increase the competence of all the employees, contribute to the upgrading of women's qualifications and lead to a democratization of employer-employee relations.

As women's life experiences differ from that of men, changes in the forms of work and technology characteristics will take place through the active participation of more women in the designing of work and technology. This could have a positive impact on all people. When women take a proactive stand and consider issues from their own interests, it can become clear how life and the development of one's abilities are being squeezed in a narrow-minded understanding of technology - an understanding that sees technological development not as something desired politically and as a socially defined decision, but as an end in itself.

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