Participatory Design and Participative Practices in Small Companies

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ABSTRACT

Small companies are missing from the literature of Participatory Design. Yet participative practices are important in the design of any job. This paper considers the relations between the work practices and technology needs of small companies, and the discourses of Participatory Design. Because small companies use off-the-shelf technology, these relations are shaped by the geographic and cultural separation between the situation of use and the situation of design. User participation focuses on shopping decisions, and the fitting of purchased technology to the local work situation. While many aspects of job design can be extremely flexible within small companies, participation in the design of computer systems is bounded by the available products, and the options for continuing design-in-use that are embedded within them.

Keywords

Small Companies, Shopping, Tailoring, Visual Designers, Participative Practices, Workplace Democracy

INTRODUCTION

Currently, some 40% of the Australian workforce, over 3 million people, own or are employed in small companies. These are defined as independently owned and operated companies that employ less than 20 people (*Small Business in Australia*, 1993). The effective use of computer technology is vital to the definition and survival of an increasing number of these companies, and to the quality of the working lives of the increasing number of people they employ. But small companies have received little attention either in studies of user participation in system design, or in broader studies of participative practices in the workplace. While there may be specific historical explanations for this exclusion, the boundaries of any discourse are shaped, over time, by what it produces. Participatory Design's traditional focus on large workplaces risks its self-definition as relevant to only limited domains of work. My interest in this paper is to identify and explore some possible relations between the work practices and technology needs of small companies, and the discourse and practices of Participatory Design.

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For people employed in small companies, participation in the design of their systems is rarely a question of the nature of their involvement in the development of software. Instead they rely on off-the-shelf applications that have been developed somewhere else, usually in another country. That is, the situation of use is both geographically and culturally separate from the situation of design. The relations between design and use are mediated by various intermediate distributors, vendors and support services, that operate within and across different countries, and are regulated by different laws, corporate mores and national agendas. With or without the involvement of a professional system designer, user participation in small companies focuses on such issues as shopping decisions, consumer rights and protection, and the compatibility, tailorability and reliability of off-the-shelf applications. Their size does not protect small companies from the economic realities of globalisation, or the changes to work practices and expectations that result. On the contrary, these changes define the marketplace in which they have to compete for their survival, and they have neither the economies of scale, nor the protective buffers, that larger organisations can rely on to carry them through uncertain times. Small companies need to rely on the flexibility and commitment of both their employees and their management, and increasingly on the reliability and appropriateness of the technology they use.

Participatory Design has its roots in the Scandinavian tradition of systems design, that has historically focused on the active involvement of a largely unionised workforce in the development of the computer systems they will use in their work (Bjerknes et al., 1987; Bødker et al., 1988; Greenbaum and Kyng, 1991). This tradition, in turn, is linked to preceding socio-technical commitments to increasing workplace democracy and participative practices of job design, whether or not computer technology was involved (Emery and Thorsrud, 1969). Australia has its own long tradition of industrial democracy, and participative practices in the design of work within unionised workplaces (Emery and Emery, 1974; Dept. of Employment and Industrial Relations, 1986; Emery, 1989). But with the

notable exception of the work of URCOT[1], these local traditions of participative practice have continued with little direct relation to, or even awareness of, the focus and contributions of Participatory Design (Botsman and Rawlinson, 1986, p. 26). While user involvement in systems development, in large organisations, is nevertheless claimed to be well established and assumed (eg. Clarke and Cameron, 1989), our small companies are rarely unionised and usually buy their technology off-the-shelf. How then might their relations to the discourses of Participatory Design be framed? My starting point here, is the recognition of the central importance of participative practices in the design of any job. From this position, the practices of Participatory Design that are relevant to small business are those that enable and support the participative design of work, irrespective of the national or industrial location of the people involved.

The research that grounds this paper has involved extensive workplace interviewing and field studies within small companies that made products where visual design is basic to the product definition. The Australian design industry is almost entirely made up of small, often very small, companies. It is also an industry that has been fundamentally redefined by computer technology as more applications for digitised images are found. Regular computer use, at least at some stage in the design process, is now the norm, and the use of communications technology is increasing. Companies studied included those producing video animation, involving both hand and computer generated images, educational software and multimedia applications. desktop publishing, storyboarding, cartooning, theatre and exhibition design and fashion design (eg. Robertson and Gidney, 1993). Intensive case studies were made of the design of multimedia educational applications in two of these companies (Robertson, 1994).

WORKING IN SMALL COMPANIES

Joan Greenbaum documented and analysed the effects of changing economic conditions on office work in America (Greenbaum, 1995). She highlighted the loss of permanent jobs, and the growing ranks of temporary workers and competing freelancers. While Australian social services, industrial conditions and attitudes still remain very different to those in America, the trend away from permanent employment in large organisations is common. A recent Australian Government report, *Enterprising Nation*, (1995), considered the effects of major global structural changes to our economic systems and hence to our workplaces. In a section entitled *The Growing Importance of Small and Medium Sized Enterprises*, the report states

> While large corporations, especially those in mining and manufacturing, still make the biggest contribution to Australian export revenues, they have over time been making a smaller contribution to employment and overall economic activity.
>
> In the export sector, over 80% of Australia's emerging manufacturing exporters and 65% of our service exporters are small to medium sized enterprises. Domestically, 96% of all private sector, non-agricultural firms in 1993 were small to medium sized enterprises.
>
> More effective operation of small and medium sized enterprises is becoming increasingly critical to promoting sustainable economic growth.

It would appear then, that while large corporations will go on doing what they do, we need to look towards smaller companies to generate the economic activity needed to maintain employment. The percentage of the workforce employed within them will continue to rise.

I am not claiming that all small companies are glowing examples of robust workplace democracy. Some are, some are not. Moreover, people employed in them do not have the formal industrial protection still available to those in unionised workplaces. They are protected only by general industrial relations legislation. But trends in changes to this legislation are towards the steady erosion of existing industrial protection, irrespective of the size of company or the unionisation of employees. Within this shifting context, people owning and working in small companies, particularly those whose work requires skill and training, can and often do have the power to self-organise and define their own work culture and work practices, without the constraints imposed by bureaucracies, institutional and / or foreign shareholders, or impersonal management techniques. In small companies, the specific relations of obligation and dependency between employer and employed are structured very differently to those in large companies. Owners are usually involved in day-to-day production, and employees rarely fill rigidly defined positions. The social organisation of work within small companies reflects these differences. This means that there are different opportunities and constraints on the agency of people working within them.

Working in small businesses can offer an alternative to accepting permanent temporary status in large organisations, or working as a single freelancer. It is also important to remember that many people work in small companies by choice, not because they are unable to find employment in large companies, but because they value the flexibility and agency that work in small companies offers them. Moreover, small companies have traditionally provided employment options for people whose interests are less central to those of large corporations, that is for women, for non-Anglo-Saxon males, and increasingly for people who do not wish to work under the changing corporate mores imposed by large, often globally organised companies (for an account of such a company see Robertson, 1994). Issues of workplace democracy and participative design of jobs, including the technology used in those jobs, are therefore becoming increasingly relevant to those working outside of large organisations. Technology designers, who are committed to maximising the agency of users of technology, miss a crucial location for action if they ignore those who are attempting to control their own work practices by working for themselves. Appropriate technology can determine how

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[1] Union Research Centre on Organisation and Technology.

easily and effectively people working in small companies succeed in maintaining and defining their jobs.

In small design companies, employees generally have skills that the company depends on very directly. Replacing them is both difficult and expensive, and designers can always self-employ if they don't wish to remain with a particular company. Employees of small companies, working in industries that are not so reliant on their employees' skills, may not enjoy the agency of designers. Employee bargaining power is an asset irrespective of the size of the company. But any small design company with management policies that produced low employee morale and commitment would quickly go broke. It was clear from the research reported here that designers enjoyed a great deal of flexibility in the design and definition of their jobs.

Nevertheless, there were barriers to full participation in the design of the technology they used in their work that neither systems designers working with small companies, nor users, whether management or staff, currently have any direct power to remove. They were caused by the fact that small companies are purchasers of off-the-shelf technology and lack the infrastructure, and the economic means and justification, to design their own systems from scratch. They must make do with what is available, within the marketplace, and within their invariably tight budgets. Participatory Design approaches that could assist the removal or weakening of these barriers to participation are particularly relevant both to the technology needs of small companies and to the agency of the people who work within them.

A major source of my impetus for exploring the relations between small companies and Participatory Design can be traced to one memorable day during the period the research was done. I spent that day visiting several small design companies. In every one of them, productive work had completely stopped because of some kind of technology failure. All effort was devoted to either fixing the technology or to finding invariably costly workarounds that would enable them to meet their commitments to their clients. It is clearly in the interests of these companies to find ways to improve the design, flexibility and reliability of their computer systems.

RELATIONS BETWEEN PARTICIPATORY DESIGN AND SMALL COMPANIES

Much of the Participatory Design discourse is structured by a series of dichotomies. These include the dichotomy between organised labour and management, between designers and users (Markussen 1994), between the Scandinavian tradition and responses to it in North America and Britain (eg. Muller et al., 1991), and between custom development and packaged software development (eg. Carmel et al., 1994). It is assumed in each of these dichotomies that the organisation where the development is situated is large. The relation of small companies to Participatory Design, when it is defined by these dichotomies, is essentially one of exclusion. They are outside the organised labour/management divide because they are not unionised and the relationship between employer and employee is differently defined. They rarely have the resources to employ a professional designer or even to include a specialist system designer in their company, so the same people act as both user and designer. Small companies do not have the resources to engage in what Tom Erickson described as the canonical case of Participatory Design - where 'users and designers work together over a long period to craft a system uniquely suited to the tasks, practices and environment of its users.' (Carmel et al., 1994, p. 34). Nor are people who work in small Australian companies generally involved as participating users in package development companies in the US. They are customers, who are geographically and culturally removed from the package design situation. Once a relationship of exclusion is identified and accepted, then there is really not much else to say. But Randi Markussen (1994, p. 62), argued for the importance of reconceptualising dichotomies, rather than risking being caught within them.

Taking another starting point then, Greenbaum and Madsen (1993), identified three different perspectives for the need for Participatory Design approaches in the design of computer systems that made them relevant to other situations of use. These perspectives are pragmatic, theoretical and political. The pragmatic approach argues that Participatory Design has a role in getting the job of systems design done better by recognising that the people who do the work know best how it is done and that involving them in systems design benefits everyone involved. The theoretical approach recognises that designers and users differ in their experience and knowledge. Traditional Participatory Design techniques, like prototyping, are ways to assist designers and users to understand each others' experience. The political perspective cuts through different work situations by recognising that people have a right to influence their own workplace, and that designers have a responsibility to build systems to improve the quality of work life. Participatory Design then is an approach that supports workplace democracy (see also Kjœr and Madsen, 1994).

People working in small companies have a stake in each of these perspectives. That stake will, of course, be determined by the situation of use. Given the boundaries to full participation that their dependence on off-the-shelf software currently dictates, the relation of small companies to the practices that these three approaches to Participatory Design suggest, will be partly in their control and partly determined by the practices of those who design and sell packaged software, and other technology products. In the remainder of this paper, these relations will be explored through an examination of the participative practices within small companies that are concerned with the selection, installation, and tailoring of the technology they use. How these practices relate to the broader issues of workplace democracy will also be considered.

System Design as Shopping

The pragmatic argument that involving users in the design of their systems produces better systems, is crucially relevant to small companies. Each member is very closely,

if not directly, linked to every dollar earned. Budgets are always tight. Small companies do not have the economic buffers that large companies can use to carry them through purposeful trial and error solutions to technical problems. Inappropriate systems have to be lived with, often to the detriment of those whose work is shaped by them, as well as the overall well-being of the company. People's jobs and assets are vulnerable to even quite small economic loss. In turn, economic loss can result from factors other than market forces, including unproductive work practices, inefficient technology, and discontented company members. In this situation, any approach that will reduce the risk of inappropriate technical solutions, and increase employee satisfaction is to be valued. Moreover, given the small number of people involved, the agency of those employed, and the usual involvement of the company owners in the day to day production, user participation is difficult to avoid.

But their reliance on off-the-shelf technology means that someone else, somewhere else, has already made the design decisions that are embodied in the different elements that the system designers have to integrate into a workable system. Irrespective of any use of Participatory Design techniques in the initial design of the product, the relation of small Australian companies to the situation of design is bounded by distance, and complicated by long, usually unaccountable, chains of distribution. In small companies system design essentially reduces, at least in the initial stages, to shopping. Like any complex shopping problem, successful system design requires highly skilled shoppers, careful consumer research, an understanding of the need the purchase is intended to resolve, and an often extensive search for the best fit among whatever options are available. Sources of information include magazines, the occasional use of consultants, word of mouth, user groups, general industry standards, and existing expertise in the use of various system components. Decisions are made on the basis of what products are available and known about, what they do, how well they do it, their useability and affordability, how they fit in with existing systems and work practices, and client expectations. User participation in purchasing decisions can improve the quality of those decisions by ensuring that the product requirements are clearly defined in relation to the actual work those products are needed to support. But participative practices within an individual company have no relation at all to whether the appropriate product is available in the marketplace.

In the case of the production of multimedia education software, there is a limited range of authoring products available on the market. An authoring application is used to gather and structure the different elements included in multimedia software. These elements would have been produced by specialist applications, including those supporting image manipulation, illustration, sound and video. Two companies producing multimedia products were studied. In both, the designers expressed dissatisfaction with the range of interaction and branching options offered by any of the available authoring products, even with the addition of specially written functionality. The selection of their authoring applications involved attendance by those who would use the products at vendor demonstrations, attendance by some company members at expensive introductory courses, extensive experimentation with demonstration systems that incorporated limited functionality, and the careful analysis of the compatibility of the products with current systems, including other products used in different stages of production, as well as company organisation and work practices. Decisions were made on the basis of best fit, despite inadequacies in each of the products. But decisions about software purchase were complex, and the participation of as many people as were willing to be involved was seen as essential to making the best decision within the circumstances.

Each company purchased a different product. The options of one company were limited by its distributed structure that required the frequent electronic exchange of parts of developing products. This company purchased the authoring application that required the least overhead in combining and altering the various elements that made up the product. The other company was an established provider of video production and graphic design services, that had not produced multimedia products before. Their choice was shaped by the compatibility of the authoring applications with their existing graphics software. This existing software represented a considerable investment by the company, both for its initial purchase, and in the development of the designers' skills in its use.

Irrespective of the degree and nature of use participation in purchasing decisions, issues of reliability and the compatibility of later versions of the purchased product are outside the control of small companies. It is likely that they are outside the control of the product's designers. Decisions on these issues remain with the management and the marketing policies of the software producers. In one of the companies, despite the involvement of most of its members in the selection of the authoring application, the next version released was not compatible with the one they had purchased. Yet it provided much needed extra functionality that had been demanded by the company's clients. This meant that their continuing upgrades to previous training products, as well as their extensive accumulated library of generic modules, needed to be rewritten for the newly released software.

Another company employed several graphic designers whose work included the production of posters, book and video covers etc. The company had been saving for some time to buy an A3 laser printer, that would enable them to produce larger black and white proofs of their designs, as well as small runs of single colour posters. Previous difficulties, with the ability of their A4 printer to successfully print graphic files from a range of applications, had left the designers well-informed about the deficiencies in printer technology. They wanted to be able to use available printers in their workplace, for a week or two before purchase, but no vendor would provide this service. As a workaround, the designers and the person responsible for purchase, decided to gather some existing files into a

collection that they believed covered the range of their printing needs. These were copied onto a portable hard disk, along with copies of the applications that had produced them. They took the portable hard disk, and a floppy disk of software for mounting external disks, with them when they visited the printer vendors, plugged it in to one of the vendors' computers, and tested their own files on the different printers. Again, none of the printers available was a perfect fit to their requirements, but they were at least able to compare the different results and make their decision accordingly.

When this company had purchased its first computer, in the mid-80s, the vendor had demonstrated a different model to the one that had been delivered. The company had to purchase an upgrade, doubling the price of a system that was, in fact, already superseded. Since then, the company members had been wary of the promises of vendors, and had been encouraged to develop both their knowledge of available technology and their expertise in its purchase. All the companies I studied, had similar stories of inappropriate purchases These had left them suspicious, if not completely distrusting, of the claims and expertise of technology vendors. The chances of a successful shopping outcome were enhanced, not just by the participation of users who were knowledgeable about the actual work the technology needed to support, but also by the participation of users who were knowledgeable about the technology itself.

Tailorable Systems and Design for Flexibility

Greenbaum and Madsen's (1993), theoretical approach to Participatory Design recognises the importance of techniques that enable designers and users to understand each other. Traditionally, one technique has been the frequent use of prototyping, which provides hands on experience in a work or work-like setting for the different people involved in the design of systems. Other practitioners of Participatory Design, in custom development situations, have frequently argued for the rapid, cooperative prototyping of tools developed in close collaboration with actual end users and evaluated in a work like situation of use (eg. Bødker and Grønbæk, 1991). While small companies would benefit from prototyping, and the iterative development of their systems, their limited resources and reliance on prepackaged technology makes these practices difficult. Large companies using off-the-shelf products, may have the resources to support pilot studies using different products. Their buying power can even ensure vendor support with prototyping using different products. But small companies cannot afford experimental purchases. Prototyping and iterative design are limited by the options provided for this within the purchased product.

At the same time though, the dichotomy between designers and users is blurred in small companies where most members are, in varying degrees, both designers and users. In each company studied, some people were interested only in attaining the minimal skills required to maintain their own computers while others had acquired more advanced knowledge of computing and the specific technology used. These people function as the small company equivalent to the local developers described by Gantt and Nardi (1992). Problems getting users and designers to understand each others' work are not an issue within a small company in the same way as they are in situations where different people, from different areas of a larger company, perform these roles. But people working in small companies rely on the design practices of those who initially designed the products they use, because they tailor technology to fit the needs of their workplaces. This is essentially a relationship of dependence on the Participatory Design practices of the original designers of their product, particularly those practices that relate to the provision of options to support continuing design in the situations of use (Suchman and Trigg, 1991, pp. 72-73; Mørch, 1995). It is a relationship that requires the product designers to predict the needs of unknown users at the same time as they negotiate their own work within companies oriented to maximum profit.

Henderson and Kyng (1991, p. 221), defined ideal tailorable systems as those in which there are means for the users to make them fit different work situations. They identified the use of packaged software as one of the three main reasons why system design may need to change after its initial design is implemented (pp. 221-222). Packaged products are designed to satisfy as many users as possible. Trigg and Bødker (1994, p. 45), observed that flexibility of their systems is one of the areas where product organisations compete in the marketplace. It is therefore, one of the practical reasons for using Participatory Design practices in the initial design of the product. Flexibility can include the number of platforms that a product runs on, the degree to which it can be integrated with other software, whether the product's underlying conceptual model is flexible, if the product's behaviour can be parameterised, and the customisability of the systems by users with little programming skill (see also Trigg et al., 1987, p. 723; Henderson and Kyng, 1991). Each of these aspects of flexible systems is crucial for small companies. Tailoring their systems then, actually involves members of small companies in a range of different kinds of work.

One aspect of this work is the ongoing construction of the system itself. This needs to be done before the customisation of any individual elements is possible. Once the shopping decisions have been made, the new purchase has to be installed and integrated into the existing technical infrastructure. This is not a kind of work limited to people working in small companies but is common, to some extent, to most technology use (Star and Ruhleder, 1994, p. 255). Returning to my example of the purchase of the new A3 laser printer, despite extensive consumer research by company members, they had not been able to test the new printer in the actual situation of use. After purchase they experienced problems getting it to work as promised on their network. These problems were eventually solved by trial and error tinkering by those most knowledgeable about networks, as well as the purchase of extra network components.

Other aspects of tailoring work have already been discussed in the example of the small company that purchased a new version of their existing multimedia authoring application. The new software had to be installed and the various parameters provided needed to be tested and set. This work was done by the person who did most of the system maintenance work. The parameters were set according to requirements provided by the people who were using the existing application. The individual company members were then responsible for the installation of the software on their own computers, and for setting the appropriate parameters according to the results of the initial testing process. Parameters that did not affect group work were changed according to individual preference. After this, code libraries had to be rewritten to work with the new software. In this case, the tailoring process actually applied to existing software rather than the new application. This work was done by the people who were mainly responsible for coding, and the rewritten libraries became part of the general company resources.

Another kind of tailoring work was required when it was discovered that the colour palettes from the paint application, used to produce cartoons and other kinds of illustrations, changed when these images were incorporated into the authoring application. In this instance it was the graphic designer who did much of the work. Changing palettes are a common problem whenever graphics need to be displayed within applications other than those used to produce them. The graphic designer had accumulated very specific knowledge about what colours changed and what ones didn't, what sort of changes actually happened and what colours needed to be used in the paint application in order to display the desired colours in the authoring application. But tests had to be done and new palettes developed for the new authoring software. These were then shared among whoever else in the company needed them. In another company, the designers had used other solutions to the problem of mutable palettes. An application was available for the platform they used, that enabled them to develop palettes that in most cases retained their integrity, irrespective of the application that used them. Over time, each of the designers developed palettes that were reused by others in different projects. To cope with the occasions where this strategy didn't work, they had purchased a standard graphic industry book that gave colour names and codes besides printed swatches of colour. The designers used these colour and codes, ignoring the actual colours displayed on the screen in the different applications they used.

Kathleen Carter argued that participative practices within companies that use off-the-shelf technology contribute to building a 'tailoring culture' around tailorable systems (Muller et al., 1991, p. 390). Each of the examples discussed here, involved different kinds of tailoring work. No single person was responsible for this work. It was shared, with the people most involved in specific aspects of technology use taking responsibility for the tailoring involved in their area. These examples support other accounts of tailoring that recognise the role it plays in the creation and perpetuation of informally defined standards within a company (Mackay, 1990; Trigg and Bødker, 1994). The authors of each of these studies argue for the organisational recognition of the work that tailors do, and for the provision of the time and resources their work requires. In the companies I studied, the degree of organisational recognition of tailoring work varied, though the general visibility of work in small companies meant that it was never completely lacking. But the companies that appeared to be the most successful in their effective use of technology were the ones where tailoring work was recognised and actively supported as an important part of the work contribution of the people who did it. In these companies, designers were encouraged to improve the usefulness of technology by engaging in its continuing design, and then sharing their results. Tailoring had the added benefit of developing the designers' knowledge of the technology. This, in turn, increased their expertise in selecting further technology for purchase.

Participatory Design as Job Design

The commitment of many practitioners of Participatory Design to the right of people to influence their own workplace, including the design of computer technology, is central to Greenbaum and Madsen's (1993), definition of the political approach to Participatory Design. They attribute their own commitment to workplace democracy to their roots in the Scandinavian Tradition with its emphasis on custom development within unionised workplaces. Yet workplace democracy is every bit as important to the people who work in small companies as it is to anyone else. Their size means that small companies do not have the extended hierarchies of management, and rigid job descriptions that can bound the involvement of people, working in large companies, in the design of the work they do. The flexibility and potential for increased agency that small companies can offer the people they employ make them attractive options for those who want more control over their work. At the same time, people who work in small companies lack the industrial protection of unionisation and the survival of their companies is vulnerable to small changes in market conditions and government policy.

As Participatory Design practices become increasingly incorporated, even on a token level, into mainstream theories of system design, its political foundations risk being forgotten, and its contribution reduced to the economic benefit, to management and owners, gained from increasing the effectiveness of technology. I do not mean to suggest that this is not an important consideration for any company. In the first instance, people's jobs depend on the continuing economic survival of the companies, small, medium and large, that employ them, whether they have much decision making power within them or not. But to quote Ellen Bravo (1993, p. 11), 'There is a big difference between making suggestions and making decisions; and there is a difference between having the right to participate and having power.' It is clear that user participation in the design of computer systems, does not necessarily guarantee

workplace democracy. Participative practices in job design need to be supported in their own right.

In the introduction to one the early texts on participative practices, Fred and Merrelyn Emery (1974, p. ii), maintained that the critical leap from bureaucracy to democracy is made by the devolution of levels of management function, with the responsibility this entails, to a work group. They argued '*The more that a group manages itself the more it is democratic*' (p. ii, original emphasis)' Their participative practices developed from a need to speed up traditional socio-technical methods for the acquisition of knowledge about a workplace, and the recognition that 'there are already people who collectively know all that: they are the people who work there. Moreover, they already have ideas, and in many cases strong views, as to how their work sections can be changed for the betterment of themselves, their mates and the enterprise as a whole. By pooling their knowledge and initiatives for change, they themselves can redesign their workplace. *This is the essence of participative design*' (Emery, 1989, p. 8, original emphasis). While participative practices in small companies are facilitated by the absence of bureaucracy, the essence of participative design was, and remains, the redesign of their workplace, by the people doing the work, in their own interests as well as those of the company as a whole.

But the importance of industrial and global economic context for participative practices is becoming increasingly clear (Blomberg et al., 1995). Increased competition, in an increasingly global market, means that the general social and political acceptance of rights to workplace democracy can no longer be taken for granted. On a local level, this paper is written after the recent election to power in Australia of a conservative government, that is committed to diminishing both the industrial power of our union movement, as well as the existing industrial protection provided for those who work in small companies. Many of the people whose work conditions will be eroded by these changes were among those who elected the new government. As I reflect on the shifting ground in which the right to workplace democracy must be defined and asserted, I have found myself continually returning for inspiration to a systematic reexamination of the history and principles of libertarian socialism, that I embraced so enthusiastically as a young woman. Central to the different versions of this philosophy is the responsibility for political organisation, and action, of those whose interests are directly at stake.

In a recent history of the Australian activities of the International Workers of the World (IWW), Verity Bergman (1995), recognised the existence in Australia of a political tradition 'from below', one that trusts neither the 'Bolshevik style of revolution from above nor the Labor one of reform from above' (p. 1). This tradition of self-emancipation, defining of the IWW, and more recently of the actions of the NSW Builders Labourers Federation in the early 1970's, the anti-war, Women's Liberation and other broadly-based liberation movements, is based on the principle 'that there are none better to break the chains than those who actually wear them' (p. 1-2). While I enjoy the resonance of this principle with Participatory Design's recognition that there are none better to design the systems than those who actually use them, there is a broader point to consider. Our efforts to ensure the participation of users in the design of their systems may enable some influence over some aspects of their work, if they have it. But irrespective of the size of the company involved, the achievement of workplace democracy is not directly within the influence of the discourses and practices of Participatory Design. It remains, as always, an organisational issue, and above all a political one that needs to be defended on many fronts. One defence is the setting up of small companies that can employ people on their own terms. Political traditions that have valued self-emancipation, have always emphasised the central role of political organisation at the point of production (Bergman, 1995, p. 152). That is, in the situation of use . Another defence of workplace democracy, then, can be Participatory Design practices directed towards the design of off-the-shelf technology that supports continuing design, by the user of the technology, in the situation of use.

CONCLUSION

Starting from the premise that participative practices are important in the design of any job, I have argued that the growth in small business employment makes them a crucial location for the attention of designers who are concerned with the empowerment of the users of technology, through their participation in the design of the computer systems that support their work. Technology use in small businesses is characterised by the separation between the situation of use and the situation of design. This is the determining condition in the relations between the technological needs of small businesses and the discourse and practices of Participatory Design. But small companies must compete in an environment of global economic change without the economic buffers and economies of scale that are available to larger companies. Their size means that small companies are dependent for their survival on the productivity and flexibility of the people who work for them. Their size also means that the links between this productivity and flexibility, the effectiveness of technological infrastructure, and the agency, contentment and commitment of company members, are clearly visible.

People who work in small companies can have the power to define their own work practices, and to structure and restructure the internal organisation of their workplace. This power of self-determination, that makes small businesses so attractive and accessible to many people, is compromised by the cultural and geographic divide between them, and the situation of design of the computer systems they use. For the designers of systems within small companies, the challenge is selecting the best fit technology from what is available in the marketplace and adapting it to the local conditions. User participation in this process is crucial to the quality of purchasing decisions and the effectiveness of the adaptations. But it cannot

ensure that the required products are available for purchase. Workers in small companies remain dependent on the designers in the companies that develop off-the-shelf products, to ensure that the products they design are tailorable, flexible, robust and appropriate to the different realities of the work they are designed to support. The availability of technology, that supports continued design in the situation of use, can determine how easily and effectively people working in small companies can succeed in maintaining and defining their jobs.

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