

# **Information and Communication Technologies in the Home: The Case of Teleworking**

by

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The idea of teleworking has received a considerable amount of attention in recent years. The concept of using new information technology to work at a distance from the normal work site, referred to initially as telecommuting, first came to wider public attention in the US in 1973 (1). Since that time, a whole academic literature on this field has emerged (reviewed in Haddon, 1989) alongside considerable media attention. The potentially radical implications of telework for our working lives and for our homes have meant that the topic has been examined both within futurological writings and State instigated programmes (in the US, UK, and at a European level).

Why should telework attract so much coverage? The point is that over and above the practical benefits and drawbacks of this particular set of working arrangements, telework provides us with a very potent symbolic. Indeed, Huws remarks that 'it is difficult to escape the suspicion that it has acquired a symbolic importance quite out of proportion to its actual prevalence' (Huws, 1991:20). We are talking about altering the boundaries of home and work which have been established since the Industrial Revolution. If such a relocation of work in the home occurred not in isolated pockets but on a scale predicted in some of the more optimistic forecasts, then this would certainly have a considerable bearing on the patterns of everyday of life. We can see how such a change takes on mythic qualities when portrayed as a rediscover of some idyllic rural existence though high tech. In such rosy scenarios, we are told that we can once again find an enriched family life which had been impaired for so long by the demands of and struggle into work in the big city (2).

It is important not just to understand these symbolic aspects, these public representations of telework, but also ascertain how this set of working arrangements are relevant for the future of information and communications technologies. Although this question has not been a focus of the telework literature to date, our own previous research in the area has already started to suggest ways in which telework can structure the use and experience of a range of ICTs (Haddon, 1991). A central purpose of this paper is to develop still further our hypotheses and frameworks to understand how these processes might operate.

## **The Telework**

Various writers (e.g. Huws 1988:61) have pointed to the diverse meanings of the term telework and the related difficulty of defining the concept (3). Our focus in this paper will be on the work arrangements which have received the most attention in the telework literature: where someone works mostly at home using information technology. This 'telehomeworker' is not only the ideal type referred to most frequently in policy, academic and media discussion. This type of telework is also the most relevant and interesting for our longer term investigation of information technologies as outlined earlier in the paper. There are a range of potential implications from work entering the domestic sphere and utilising some of the very ICTs with which we are concerned.

How different is telework from traditional homeworking, be it small-scale manufacturing (e.g. clothing, food, toys, greetings cards and household furnishings) or

the provision of services in the home (e.g. childcare, bed and breakfast) (4)? The key feature of telework which differentiates it from homework in general is that it involves some processing of information, ranging from professional tasks (e.g. computer software programming, design, accountancy, editing) to clerical ones (e.g. word-processing, data entry, insurance form processing). But although these provide some of the standard examples in the telework literature, the boundaries of telework are far from unclear.

One first point to make is that, despite much reference to the dichotomy between professional and white-collar telework, clerical work merges into professional work as some clerical tasks start to require more and more skill and training. Second, although their labour has not necessarily been discussed as 'telework', some professionals such as academics often work from home (and increasingly use ICTs such as micros) (5). We would argue that any practices which introduce such work into the home should be included in our terms of reference. Third, some sort of information processing with ICTs (keeping accounts, word-processing) is increasingly becoming part of the work of many small businesses, and indeed of some traditional homeworking. The fact that there is a gradual continuum between work where the use of ICT is minimal and work where it is of central importance means that the boundaries of telework must remain blurred.

The other main continuum which we need to consider is between working 'at' and 'from' home. Mobile workers such as sales representatives or consultants who visit the sites of clients often use their home as a base (6). While such working 'from home' will have some effects on domestic routines, working 'at home' is more significant from our viewpoint in terms of actually bringing work into the home. That said, many teleworkers work in part from home and in part at home and their precise schedule may vary from week to week. Once again, the boundaries are blurred.

While the above considerations serve to expand this range of relevant teleworkers, one final observation needs to be made about a common image of telework. It is of work performed on either a microcomputer or terminal which is linked by telecoms to a distant mainframe computer (Brocklehurst, 1989:33) (3d). Although such telework exists - for example, on-line data entry, software or database design on a remote mainframe - such communications-based work is rare (4). Hence, we prefer the broader definition which we have outlined: one shaped by a combination of the existing literature on the subject and our own interests in the role of work and of ICTs in the home.

## **Research on Telework**

Telework has attracted interest from diverse quarters. What has therefore emerged is not one but a variety of discourses about telework, involving different images of the teleworker, different 'problems' for which telework is a solution and different perspectives from which to evaluate this phenomenon.

The topic of telework started to gain publicity in academic circles in the early 1970s when the energy crisis led researchers to consider telecommuting as an alternative to

physically commuting. Huws (1991:22) notes these writers usually portrayed the teleworker as a male manager or professional living in the outer suburbs. Since that time, geographers and town planners have retained an interest in the effects of telework upon patterns of commuting and hence upon urban design and ways of life.

The predictions of popular futurologists such as Toffler in the 1970s and 1980s did much to establish telework in the popular imagination. Some of their descriptions of telework fitted in with themes from the more libertarian politics of the 1960s where IT could be used to break down vast corporations by allowing decentralised small workplaces to intercommunicate. In this scenario, 'creative' workers - implicitly male - choose telework as a lifestyle option (Huws, 1991:22). It is worth noting that many of these more futurological (and journalistic) predictions have assumed that it is technology that will drive the development of telework. However, a far less technologically determinist view arises from the experience gained on actual telework programmes (Judkins et al, 1985:61; Brocklehurst, 1989:32). Social and organisational factors are more important than the availability of technology.

A more academic strand of analysis emerged in the 1980s from managerial and business schools, and in particular from schools of personnel management. These generate not only much speculation about the many issues which could arise around telework but provided the source of many empirical studies which have emerged in recent years. Under the heading of 'human resource management', telework has been seen by these writers as simply one form of flexible labour among others. Indeed, when telework schemes have been implemented they have sometimes been fitted into a package, including career breaks, flexitime, or the option to vary the number of hours worked over the course of a year (e.g. to adapt to school holidays).

Telework has been presented to management as a way of delivering a more flexible labourforce and so could be clearly located within contemporary discussion of the need to develop firms which could adapt more easily to market changes. As Huws (1991:27) observes, such arguments for telework sometimes suggests that the both the worker and firm can derive flexibility from this arrangement, when in many instances it is the worker who has to fit in with the demands of the company (e.g. working when the demand for the firm's services were at a peak).

Although the benefit of flexibility is a very controversial one, it is not the only rationale for introducing telework. Telework has been offered as a privilege or perk, or more often simply to enable certain skilled or experienced staff to be retained. Telework has also been used as a way of recruiting staff under conditions of labour shortage, and where there was simply a shortage of office space.

Huws (1991:29) notes that a more recent discourse into which telework has been inserted is that concerning the enterprise economy. Here telework is an intermediary stage on the road to entrepreneurship, where employees break away from their previous company to set a small business in the home - perhaps as a prelude to moving out into separate premises. Rank Xerox's 'networking' scheme was the most publicised case of this move to self-employment, whereby the firm encouraged some senior executives and professional staff to set up their own businesses while initially guaranteeing them some work from Xerox. This was a scheme taken up mainly by

male staff. In fact, Huws notes that the image here is one of males working long hours to inject new life into the traditional values of self-reliance and the free market - even if, as can we shall see, many women have also set up businesses.

A more critical approach to telework has been adopted by the Trade Unions and bodies such as the Low Pay Unit which have long monitored telework as part of the changing nature of working conditions. Their concern dates back to fears in the 1970s about the impact of new technology on work, especially the threat of deskilling. Making comparisons with traditional homeworking, these researchers feared that teleworking could be a means of applying exploitative conditions of service to the clerical labourforce. In particular, the benefit for management of flexibility - and its promise of reducing labour costs - had a different meaning for the unions. It could imply a 'casualisation' of the workforce, as the firm reorganised its employees into core and peripheral workers (Holti and Stern, 1986:45-6; Brocklehurst, 1989:24-5). Moreover, isolating employees from one another militated against collective union action to resist pressures from employers. Thus, teleworkers might not only become non-unionised but non-unionisable.

Unlike some of the earlier images of teleworkers, both the analyses from management school analysis and the union research have paid particular attention to women teleworkers. They are aware that it is women who are more likely to want flexibility of working hours to cope with their domestic responsibilities. In particular, various studies have suggested that it is precisely the group with pre-school children who constitute a clear majority of female teleworkers (Kawakai, 1983:45, Huws, 1984:28; Christensen, 1987:212). Huws (1991:25) draws attention to the way in which optimistic writers in the early 1980s saw telework as a solution to a tension within society between the need for women's paid labour in the white-collar workforce and for their unpaid labour at home. In this scenario, telework help to retain the traditional family, with women staying in their 'proper' place within the home.

Understandably, there has been a strong feminist response to this suggestion, especially following their 1970s focus on the housewife who was trapped and isolated in the home (Huws, 1991:24). Going out to work and being present in the workplace was seen as being important for women's self-identity, social standing and influence. Feminists have been keen to point out that although telework may be a solution to women's dual role, and hence one adopted by some women, it is by no means the ideal solution - with many writers pointing to the difficulty of working with young children around, and the stress of coping with both work and domestic roles when in the home (for a summary, see Haddon, 1989). Moreover, there has been a feminist undercurrent in much union research which draws parallels with women's negative experience of traditional homework. Women are already disproportionately located in the peripheral, secondary labour markets with poorer conditions and narrower options. The fear is that teleworking might have the potential to exacerbate this trend, and further marginalise women within the workforce (Open University, x:73).

Instead of supporting telework, most feminists have noted that there are other factors that have a bearing on the problems faced by women wanting or needing to work. They have drawn attention both to the longer term need to change gender roles and responsibilities and to the more immediate initiatives which could be introduced such

as increased job-sharing, childcare provision, tax changes relating to childcare, etc. Thus, the facilities offered by firms, the services available in a particular locality, and Government support and regulation can all play a part in structuring the decision to take up teleworking. While acknowledging that in practice telework can be a solution to a problem faced by women, feminists stress how it can be a very imperfect solution. At best, it may be a compromise between conflicting demands, one which is adopted because the other practical options open to women as individuals offer nothing better.

In addition to these debates about telework, policy-oriented documents and symposia have been inspired and sponsored both by individual Governments and by the EEC. For example, between 1977-81 the French Government sponsored a number of reports and conferences (Monod, 1983:21). The US Government has instigated both technology assessments and conferences (Huws, 1991:26). Sometimes such State involvement arises from a more general interest in promoting new high-technology related practices. At other times, reports have been instigated because of the State's regulatory role. The European Commission's FAST programme has sponsored several studies, and the EEC has also shown a particular interest in the regional implications when work is less tied to specific locations.

Various agencies have also developed an interest in the implications of telework for their own areas of operation. For example, a number of departments at BT have monitored telework because of the implications for telecommunications services. BT marketing have carried out research (8) and the company has funded a five-year programme to examine the area at its R&D labs at Martlesham. British Rail and its sub-sections such as Network South-East have monitored developments because of the potential consequences for commuting traffic. Rural and regional development agencies clearly have an interest in the potential of telework for their concerns: for example, the agency for the Scottish Highlands and Islands is working in conjunction with BT's experimental programmes. Associations dealing with the disabled have some interest in this area, even if their main concern is to make worksites more accessible for the handicapped (Haddon, 1991b). And lastly a range of other public authorities have an interest in monitoring telework where this new arrangement touches on matters such as central and local Government taxation or local area zoning plans (e.g. defining some areas as residential).

Many of the above agencies have organised studies of telework. The first US documentation of actual telework experience was carried out by Olsen in the early 1980s (Olsen, 1981). In another small survey shortly afterwards, Pratt's analysis of citation indices led her to note how the topic of telework was just starting to gain popularity in academic circles at that time (Pratt, 1983:2). The same point can be observed in relation to British indices. And in the UK Huws' 1984 work played a pioneering role. Even though the sample was fairly small, consisting of 78 teleworkers, this was still larger than many of the previous US surveys. Xerox published an evaluation of its project in 1985 (Judkins et al, 1985). The most recent substantial contribution has been Kinsman's book (Kinsman, 1987, which focussed mainly on the teleworkers employed by his sponsors: F-International and ICL.

Judkins and Kinsman also provide examples of research and publications emanating from firms who have themselves set up actual teleworking programmes. In 1984, one US report claimed that there were 24 company based teleworking experiments which incorporated their own evaluation (cited in Kraut, 1987:126). Admittedly, in some cases publicising telework initiatives seems to be part of a wider public relations strategy which has served to advertise the firm concerned (9). Nevertheless, if examined critically, this material can still lead to some insights about the experience of telework.

## **History of Telework Initiatives**

Although a number of informal arrangements have probably existed over the last 30 years, the earliest recorded telework initiatives in the UK which are still surviving date back to 1960s. These involved \*software programmers - mostly women who had left office based-jobs to have children - working for F-International (later the FI Group) (1962) and ICL (1969). Some Governments and major companies started to take an interest in the area in the late 1970s and early 1980s. For example, the French telecoms body D.G.T. started to examine the telework in 1979 (Monod, 1983:2), as did IBM (Olsen, 1985:100) and Mountain Bell (Olsen, 1985:33). This interest culminated in several trial projects. By 1981, Business Week listed 11 companies which were experimenting with telework schemes (Pratt, 1983:2). In the UK, Xerox started its programme in 1982, at the same time as a DTI scheme was launched aimed at the disabled.

Currently, the US has seen the most experimentation with telework schemes, followed by the UK. On the whole, high-tech firms, and especially communications and computer companies and divisions, have had the highest profile. Their experiments have acted partly as a showpieces, partly to test out relevant technologies produced by those firms (Monod, 1983:3) and partly to explore the practicalities of teleworking arrangements (Olsen, 1987:142). Banks and insurance companies have been the other major employers to experiment with this new form of working (Kelly, 1984: 48). More recently, local authorities have produced some initiatives: especially Hampshire, Kent, and Enfield in the UK (10).

Despite this history of interest, telework has developed far more slowly than some of the predictions had anticipated, which in turn has had implications for the very investigation of this area. Media and even academic coverage has often re-reported the activity of just a few companies. This process was noted earlier in a US review (Kawakami, 1983:29) and still appears to be true today. In the UK, it is the teleworking staff of the FI Group, Rank Xerox, and the DTI scheme who have been repeatedly approached and hence present a very positive picture of the telework experience. In particular, analysts of telework have repeatedly noted that such schemes overrepresent the experience of professional workers as opposed to clerical ones (Bailyn, 1988:144; Holti and Stern, 1986:77, Brocklehurst, 1989:36).

At the same time, some other firms experimenting with telework have been loathe to release their evaluations (Niles, 1988:303), and where these schemes are reported

only broad outlines are provided. And various researchers who have been involved in this field for some time have managed to find out about a range of initiatives where the firms concerned do not necessarily want their interest or involvement in telework to be publicised at all, nor allow their staff to be interviewed (11).

## **Numbers of Teleworkers**

The most common figures cited are not those on actual numbers of teleworkers but are predictions of how much telework is possible based on job analysis. These range from Toffler's future scenario (written in 1980) that 25-50% of the world's workforce could become teleworkers to NEDO's more sober estimate in 1986 that 10-15% of the UK labour force could telework by 1995, rising to 20% by 2010 (all cited in Brocklehurst, 1989:7). In the 1988 conference sponsored by BT and the CBI, the Henley Centre for Forecasting (1988:35) estimated that roughly 50% of employees and 43% of self-employed could be doing some telecommuting by 1995 - which an important figure because Henley's predictions concerning this area have been cited elsewhere. Henley and Empirica have also used attitude surveys to show that a good deal of interest in telework exists amongst the labourforce (Henley, 1988; Huws et.al, 1990)

In his review of these estimates, Brocklehurst (1989:9) notes that predictions of both the possible and likely size of the teleworker labourforce tend to rely on experts' evaluation rather than evidence. Whenever anyone simply cites figures concerning the number of teleworkers, their source is far from clear. (For instance, in 1987 Forester claimed there were 1.7 million teleworkers, while in 1988 the Director General of the CBI proposed the figure was 2 million (Brocklehurst, 1989:9)

In fact, Brocklehurst (1989: 23) notes that even the literature on traditional homeworking shows that it is by no means easy to measure the amount of work done at home. There is some confusion over this matter in official statistics, and when people are required to perform a self-assessment they do not always categorise their work as homework. The only national survey of all homeworkers was that conducted by Hakim back in 1981. Huws (1988: 71) notes that of an estimated 660,000 homeworkers, 250,000 worked 'at home', and of these 172,000 were in non-manufacturing work. However, even the latter total would include occupations such as hoteliers and publicans who live and work on the same premises as well as artistic and craft workers. She notes that while many of these would not normally be categorised as teleworkers, such deciding the boundaries of telework become increasingly problematic as 'home-based workers make incidental use of computers for accounting, word-processing and other administrative functions'. Clearly, counting teleworkers is no easy matter.

## **Firms' interest in telework**



So why has telework been adopted by less firms than some of the optimistic accounts had anticipated? The consensus from most research is that the reluctance lies mainly with management rather than with the workforce - despite some trade union reservations. There are practical problems from a manager's viewpoint. Setting up a telework scheme entails some extra effort, including arranging rules about communication, measuring output and perhaps some job redefinition. But there is a more general managerial unease about risking such a radically new departure in work practices. Both surveys and case studies have revealed that managers have particular anxieties about the problem of monitoring and controlling a workforce which cannot be physically observed (reviewed in Haddon, 1989). As a result, many managers have been unenthusiastic. What telework schemes exist have often been implemented either as a limited experiment or due to exceptional circumstances which have forced managers to look for new solutions - rather than as an option for the mainstream labour force.

Apart from these considerations which have been true for the last decade, a final point has to be made about the time period when our own research is taking place. The recession is clearly having some bearing on the telework experience. Admittedly some firms have used telework as a way to reduce costs - e.g. some publishing houses have encouraged previously in-house magazine editors to work at home, simultaneously changing their status from employee to self-employed. But mostly, the effect of the current economic climate has been that firms and other organisations have become 'leaner' and shed those regarded as being peripheral workers. This includes some teleworker staff. The recession has also meant that some experiments which had been planned have now been put on ice - e.g. where the labour shortage problems which made telework attractive have temporarily disappeared (12).

### **Worker interest in Telework**

Telework arrangements may also be initiated from below. In some cases, including ones that eventually led to employer-organised schemes, staff have approached their managers with the proposal that they work at home. This most often occurred when women wanted to have children or wished to spend time with their children. Sometimes the result was isolated examples of teleworking employees within a firm, sometimes teleworkers adopting self-employed status. But it is important to note that even when it is initiated by employees, telework may not be their most preferred option. For example, some of the people encountered in the course of recruitment for this project had been made redundant or pressured to take early retirement. They only decided to become self-employed because at their age they foresaw little hope of ever being taken on as an employee again.

Sometimes, it was simply the forecast of staff cuts in a firm which prompted staff to take the first steps towards self-employment. This has included buying equipment for the home or building up a clientele by taking on extra work out of office hours while still working as an employee. Such staff therefore experience a gradual transition to telework. But for others, the change is both less gradual and less welcome: these are the reluctant teleworkers, becoming self-employed to escape unemployment, but

sometimes only succeeding in being underemployed (12). They may only work occasionally and earn a limited income. For such people, the daily experience of telework is not far removed from being unemployed. Again, the current recession has had a bearing on such teleworkers, as home-based enterprises have suffered alongside all the other small businesses.

Nor are these the only cases where the choice to work at home is only made under conditions of limited alternatives. The case of women with children has already been discussed at some length. But those living in remote rural areas also have limited job options, as do carers whose commitment to elderly, ill or disabled relatives force them to be present in the home. And then there are the disabled themselves. It is controversial to simply suggest that the handicapped or impaired adopt telework because it adds to the isolation of those already isolated and makes disability invisible. But sometimes, telework can be the only option on offer (Haddon, 1991b).

However, it must be added that the above emphasis on the more negative reasons why people take up telework is to some extent a critical reaction to the very rosy picture of high-tech working from home which is often painted. There are, as proponents of telework have (over-)stressed, more positive benefits which have attracted people to this working arrangement. Besides, past research shows that whatever the motivation for becoming a teleworker, many would decline to return to normal on-site work after experiencing some of the autonomy and flexibility which telework can allow, as well as avoiding the negative side of office life.

But in addition to those for whom telework becomes a lifestyle choice, there is a still wider population for whom telework might be attractive as simply one stage in their career. Many discussions of the subject falsely assume that someone either is or is not amenable to telework and conceptualise telework as a lifetime, once-and-for-all choice. In contrast, this working arrangement is likely to be of interest as an option for a limited period of time during many people's working career and life-cycle. This fact should be clear from the fact that many women are teleworkers either when their children are young, or when they are at school - but then return to on-site work at a later stage. Equally, it has proved to be an option for those approaching the end of their working career: as a gradual transition from work in the office to retirement at home. Telework has also been a stage for those women who ceased work while their children were young and wanted some means to return to the labour force when their children grew up (3).

It is generally clear from surveys of attitudes to work that people would like some kind of flexibility in their jobs and careers to enable them to accommodate to the different circumstances they experience throughout their life. This is exemplified in the way people may switch between part-time and full-time work during their lives. Hence, we noted how personnel departments have often offered whole packages of measures, with as one choice from a range of work options. The two important points which arise from this are as follows. First, this understanding of telework shows that we are not just thinking of teleworkers as constituting a small number of people who prefer this lifestyle. Nor is telework necessarily going to be the main life experience of the working population as a whole. Potentially, telework can be an option for a huge number of people for part of their life. Secondly, a number of the people whose

experiences are to be examined in our study will be 'passing through' the telework experience rather than permanently adjusting to it.

## **Teleworking and ICTs**

In the light of the previous discussion we can now start to address in more detail the ways in which the introduction of telework into the home can structure family relationships - and hence the family members' relationship to ICT. This process entails relating some of the themes and examples raised in the previous research on telework to the framework outlined at the start of this paper. From this, we can draw attention to dimensions of family life and the roles of ICT which merit further study, and indicate the type of questions which we need to be asking. We start by examining the implications which telework might have for ICTs in general.

## **Teleworking and Family Processes: Questions for ICTs**

In the eyes of many commentators, the flexibility offered to teleworkers provides the main advantage over on-site work. Indeed, this feature and the related sense of autonomy is also cited by many teleworkers themselves as a key attraction of this arrangement. However, two points need to be made. First, for many women especially, any 'flexibility' in the work is tempered by the constraints imposed by other factors. For example, traditional homeworkers often take few breaks or holidays from work and work long hours. They have only a limited amount of time available in a normal working day (e.g. because of child-care commitments), are paid low rates yet still desire incomes that approach work out of the home. It remains an open question as to how much this would apply to teleworkers, but we still need to ask how much any sense of freedom of choice and flexibility is constrained by their particular domestic circumstances.

One distinction which can be relevant here is that between a teleworker who is an employee and one who is self-employed. For instance, the employee can more often rely on and anticipate the pattern of regular work. While this pattern may be beyond their control, they often have some flexibility concerning when they do in the work. Some self-employed with regular clients may be in a similar position, sometimes with more options to reduce or increase their workload. But others have little control over when work is offered and lose their flexibility because they feel that they cannot turn work down now for fear of getting less in the future. The management of work also varies: employees tend to have much more contact with the managers and be more accountable to them; the self-employed are disciplined by the market, and fear of losing future contracts if they fail to perform. But day to day contact with clients can be less than employee-employer contact.

Further constraints emerge from the nature of different types of telework. For example, if the person has to be available all the time or at certain times which are fixed by the company or by clients then they may not be free to switch to other

chores, to 'time shift' their domestic labour, or to respond to urgent family demands etc. Besides, one supposed benefit of telework for the employer is that it can provide a flexible labourforce, with the option of more easily altering the number of workers depending on demand. But greater flexibility for the employer can mean decreased flexibility for the workforce. For example, teleworkers may be bound by contract to be on call in case their labour is needed. Or, they may be pressurised to work when the company or client requires them. Both the above considerations lead us to a very general question: how much control over their work do teleworkers experience and from this how does such a sense of control or lack of it structure the experience of teleworker families in relation to ICTs.

Another common theme of the telework literature is the extent to which teleworkers separate work and non-work activities in the home. For example, there appears to be some variation in the ways in which teleworkers construct both time and space for work. Although various guidelines for teleworkers often recommended a separate room for work and perhaps a fixed timetable for the day, teleworkers differ in the degree to which they find this both possible and desirable. For some, this rigid separation is attractive because it aids their self-discipline. At the other end of the continuum, work spills over into various parts of the home and is fitted in to domestic life on a far more ad hoc basis, being interspersed with chores, leisure and family interaction. This may occur if such a fluid life-style and flexibility appeals, or may be the only way to manage the telework given the space available in the house and domestic demands. In relation to our interests, the degree of separation of work and domestic life has a bearing on whether and how work-related ICTs can be used. For example, it influences whether work-related ICTs such as the micro should be used non-work purposes and vice versa; whether there are 'work' and 'domestic' versions of some equipment (the work and leisure micro, the business and home phone); and where these ICTs are located in the home and hence the degree of access to them for different family members. In other words, within the broader strategies to manage time and space for telework, what, what role do ICTs and rules about ICT use, play in different families.

Next, there is the issue of how the work-related ICT skills of the teleworker may become more visible to the rest of the family because of working at home. For example, a good many teleworkers have to teach themselves to operate equipment (e.g. faxes) and to learn new software programs (e.g. DTP). How does this influence the way they see their own technical skills and the way in which those skills are seen by other family members? Are such skills seen as 'learning to use software', which is not 'really technical', or as learning to use a computer, which may be seen in a different light? Apart from such questions about the perception of new ICT skills there are also ones about the consequences of the teleworking introducing these skills into the home. In what circumstances might this lead to other family members becoming more familiar with equipment such as the microcomputer, or when might this opportunity to develop such competence be ignored.

The potential high status of expertise with some ICT - especially the micro - is one key factor which may differentiate the experience of telework from that of traditional homework. First, the positive connotations of 'high-tech' provoke the question of how such the very presence ICTs might be used to give telework credibility. Previous

research has pointed to the problem faced by many homeworkers - that both other family members and outsiders may see working at home as 'not real work'. So under what conditions might the organisation and even ostentatious display of the 'home high-tech office' form part of a wider strategy to challenge such views and help build a positive self-image for the teleworker. Second, does the ability to control sometimes very sophisticated and powerful, high-tech equipment in the home help some teleworkers to feel that they are more in control of the actual telework. If so, to what extent might this illusionary?

The above issue of whether expertise with ICTs diffuses throughout households touches upon the question of whether some of the 'rationality' of work may spill over into the home. Producers of goods and services which offer long-term cost savings (e.g. insulation) have for some time been aware of the extent to which consumers do not always behave like the 'rational economic person' of classical economics. In many ways, the home is not organised and managed like a business, with the same degree of calculation and detailed evaluation of costs and benefits. So one question concerns the extent to which the introduction of work into the home may change this, introducing with it some of the values of the workplace. (Many self-employed already appear to be moving down this path given the detailed calculations they need to make for tax purposes). But in addition, to what extent might the management of home life become more formalised and even make use of the new ICTs. In terms of practical examples, we might want to ask whether computer software such as spreadsheets becomes used for monitoring any household expenses, or are computers used to keep any records (if only letters sent to outsiders).

We noted early on that gender was a key factor structuring the use and role of ICTs in the home. Research has also indicated that it is also of great significance in defining the experience of telework. Non-professional teleworkers are virtually always women, while the need to work while caring for children (or others) is the major motivation for women to seek telework - this is less the case with men. We would have to ask not only about the motivations for teleworking but also about the significance of their contribution to the household economy. Are they bringing in only a subsidiary income and hence constructing their identity as a marginal worker - or is contribution central. Does this mean that some teleworkers are seeking a 'proper job', perhaps to replace a previous one, while others just take on telework as a means to bring in money, perhaps one job among others? Some of preliminary research suggests that such distinctions might well be structured in terms of gender.

This has a number of implications for ICTs. The perceived status of the teleworkers, and hence their power in the home, is likely to have a bearing on their ability to find space, time and resources for their work. It influences purchasing decisions - how much priority should be given to telework equipment - as well as the ability of the teleworker to lay claim to or utilise ICTs which are already in the home, such as the phone. The status of the telework also has some bearing on the division of domestic labour, which in turn raises questions of who has responsibility for and gains familiarity with using the different ICTs.

Finally, what consequences might telework have for the place of the household in wider community? Our previous research has also provided examples of neighbours

and other acquaintances occasionally asking to use equipment such as faxes and photocopiers. To what extent can this equipment become an informal resource for social networks and the local community? When does this become an infringement and when does it provide a welcome means by which families can become more integrated into the wider community? And how do different teleworkers respond to and regulate this process?

### **Implications for particular ICTs**

A second, complementary way to examine the relation of ICT to telework involves asking questions about particular ICTs. This inevitably touches on some of the themes raised above, but approaches them from a different angle.

The obvious ICTs likely to be directly affected by telework are the phone and computer. How does telework structure the whole of the families interaction around these technologies? For example, this might include rules about not blocking the phone too much with non-work communication during certain hours. Or the computer might only be available for non-work use at certain times. In addition, the fact that technologies such as the micro are used for work may have a bearing on the whole way in which they are handled: for example, being reserved only for 'serious' uses (as opposed to games-playing) and being treated 'carefully' and with more reverence etc. Returning to the phone, our previous research noted how other family members learn to be 'secretaries' - taking messages, passing on information to callers etc. To what extent are both partners and children incorporated into the telework in ways such as this, and how does this role supporting the teleworker shape their experience of the technology - in this case, telecoms?

The use of other ICTs may also be structured by telework. The obvious example is perhaps using the TV/VCR as child-minder/child-occupier at certain times - not just when there is work to be done, but also when work-related visitors call round. Are there ever implicit or explicit deals, where children try to extract access to certain types of TV or promises about what TV can be watched in return for having to keep quiet and behave themselves at other moments? This, of course, introduces the whole issue of the various types of negotiation and relations between adults and children which occur in different families.

Even the role of ICTs such as the radio and hi-fi may be effected by the arrival of telework. For instance, there is the whole question of regulation of sound in the home while telework is taking place. Apart from simply being a distraction for the teleworker, ICT 'noise' in the house may be seen as creating a negative impression of the work environment if visitors are being received, or spoken to over the phone. On the other hand, both our research on telework and the previous Brunel studies show how ICT noise can be important and desirable for some teleworkers - ones who cannot work in silence after the 'noise' of the office. Besides, such background sound can signify the comforting sound of nearby family life. So we have to investigate how much sound is 'allowed', of what kind, and how is this negotiated.

There is also the case of the extra work-related ICTs the homes of teleworkers - e.g. photocopier, fax etc. To what extent might teleworker families become the early adopters of new domestic ICTs such as home fax? How do rules emerge allowing family members, as well as the outsiders referred to early, to make use of such equipment - including for non-work purposes? In general, how is such equipment incorporated into set of the understandings that exist in teleworking families.

There are particular issues concerning the maintenance of equipment as well as safety and security by virtue of the fact that the home is a worksite. Some companies and clients formally specify how these are to be managed, while in other cases the negotiation between teleworkers and employers concerning adequate arrangements are of a more ad hoc nature. But then, what special rules and meanings are constructed within families about the safety and maintenance of work-related ICTs: for example, whether to always arrange for outside repairers rather than trying to sort out problems with equipment for themselves; rules about packing work-ICTs away after use; even rules about touching them? How does this relate to the perceived technical skills of family members? And what new labour processes may emerge by virtue of being responsible for these ICTs?

We touched upon the management of space earlier on. Telework clearly involves issues of being able to command space in the home - including space for ICTs (and related items - e.g. manuals, magazines, paper for printers etc.). Finding space for a potentially ever-expanding range of equipment means not only cluttering up empty space (which may have a bearing on the aesthetics of the home) but also displacing other household items. So how is this handled within family relationships? Meanwhile, ICT resources which have been or might potential be communal - bought for 'all the family' - may come to located in the domain of the teleworker (e.g. the phone, home computer). How and with what degree of legitimacy can this is justified? Is 'work' used as an excuse to gain more rights to some equipment, or justify power over the use of it? In other words, we are dealing with the politics of family life. What implications has this for the domestic role of the ICTs concerned - e.g. transforming the meaning of the phone within the home.

## **Discussion**

From the amount of literature now available, telework appears to be a well researched topic. However, with some exceptions such as Huws work on the image of the teleworker which was discussed earlier, most of the literature has focussed on telework as work. The questions asked have concerned such matters as its viability as a new work arrangement, productivity, recommendations for training teleworkers and the choice of what type of staff can best cope with this option. Meanwhile critics have pointed to the negative implications for working conditions, which for feminist writers has extended to concerns about women's dual labour of domestic chores plus paid work.

Moreover, a great many discussions have been concerned with the effects of telework in terms of the problems it may cause or the benefits it may deliver. There has been

less attention to the question of the degree to which families (and not just the teleworkers) may accept this working arrangement, make it fit in with the lives, or reject it. This includes developing strategies not just to cope with telework but also to mould it to fit in with the culture of the family. It also includes examining the tensions and conflicts which may emerge.

Apart from arguing that we need to treat the family as dynamic in its encounter with telework, we have been interested to move beyond a framework which always asks about the implications for 'work' to one which highlights more general interaction with family life. Of course, various writers have referred to anecdotes or hypothetical scenarios which portray scenes from the teleworking family, but this is no substitute for the more systematic, rigorous and theoretically informed analysis proposed in this paper. Nor have the specific implications for ICTs been examined.

Hence, the approach to telework which we advocate provides a significant, new departure from previous research. Clearly, there may be many implications for the future of family relationships, which should be of relevance to both scholars and policy makers interested in this area. We have indicated how the entry of work into the home, and particularly telework, has potential to influence the shape of family relations. To return to our earlier key themes, telework introduces the public world of work into the household, bringing the potential to transform the character of the home and the schedules of working life. The boundaries within and around the household, those which define and separate the public and the private, may thus be altered. At the same time, telework becomes an element in family members' changing experience of domestic time and space, as there are attempts to impose the schedules of work organisation upon domestic life and incorporate work space into the home. And lastly, telework has to encounter the existing dynamics of gender and age which exist within the home, sometimes reinforcing these relationships, sometimes causing them to be renegotiated.

All these considerations about the future of family life have in turn implications for the future of ICTs. Hence our approach is relevant not only to academics and policy makers in this field but also to the producers of the relevant products and services. We have indicated the myriad ways in which ICTs may be affected by or implicated in the arrival of telework - what is now required is the empirical research to chart how these processes operate in detail. Last, but not least, there are the consequences for the very future of telework - which makes the type of analysis we propose of relevant to a third community concerned with the fate of this working arrangement. By providing a richer view of family life, one that goes beyond the concerns of much of the existing telework literature, we would expect this analysis to throw new light upon the experience and likely success of teleworking in the home.

## FOOTNOTES

- 1) Huws (1991, p.22) notes that even before the term telecommuter, references to the electronic homemaker can be found dating back to 1957.



2) Huws (1991, p.20) elaborates on further ways in which telework symbolically embodies various hopes and fears about the future.

3) Other definitions of telework include facilities away from a main office-site but linked to it by telecoms: satellite offices located away from headquarters (some of the options are outlined in Holti and Stern, 1986), or a facility run either by an independent company, local or central Government which is leased to the peripheral staff of several firms. If they are part of a scheme to relocate work in the countryside, these arrangements are often called telecottages. Since, these all entail commuting to a workplace, albeit to a more local worksite, they have less potentially significant consequences for ICT use compared to working at home.

We also refrain from discussing work completed at home after the main hours in the office - 'overspill work'. While this provides one way in which paid work enters the home and may certainly affect the use of equipment in the home such as the micro, the effects are liable to be less dramatic than if when someone is working mainly at home. The same is true for the informal arrangements whereby an employee is allowed to work the occasional day at home to complete a specific task without office distractions. However, both of these experiences can be stages on route to more fully-fledged telework.

4) Such homeworking has tended to be neglected in the sociology and psychology of work, although it has received some Government and academic attention in recent years - for example, see Hakim, 1987; Allen, 1983; Allen and Wolkowitz, 1986.

5) The fact that such work is often not viewed as being telework itself reflects the fact that theoretical definitions of telework are often vague and lack a clear rationale (Holti and Stern, 1986; Huws, 1988).

6) In the course of this research it became clear that a number of employers (such as Kent County Council) are examining how to introduce more flexible work arrangements generally and this is one option (e.g. for its personnel officers).

7) E-Mail has only recently started to spread to more teleworker programmes - such as the one run by Hampshire County Council. On the whole, past research shows the telecommunications links are used chiefly for voice telephony to keep in touch with employers, clients or co-workers. The main means of delivering the information to be processed or the results of the teleworkers efforts remains either post service, courier or carrying material by hand when going on-site.

Some early definitions of telework did not even require a microcomputer to be used in the course of the work. For example, even in the well known case of F-International, much of the programming carried out at home in the 1970s and 1980s required only pen and paper, and in Huws study in 1984, 23% of interviewees possessed no stand-alone or on-line computing equipment (Huws, 1984:32). The research for this report indicates even in the 1990s some work at home which centrally involves the processing information is still conducted without the aid of ICTs.

8) For example, Jacqui Cook's dissertation (1991) was produced with the assistance of BT staff in Aberdeen and provided recommendations for marketing.

9) Huws (1991, 26) notes the FI has received considerable media coverage in part because of the activities of its public relations officer, and Kinsman's work (1987) was sponsored by ICL and FI.

10) Kent and Hampshire are the councils which have gone the furthest among local authorities to allow staff a teleworking option. In the case of Enfield, the

teleworking was offered for a very specific purpose: to attract staff who could process the Poll Tax charges when that system of local taxation was introduced.

11) This can occur for a range of reasons. Sometimes, the conditions of work might be interpreted by researchers as exploitative. For other firms, such as some banks, there is concern that their customers might be worried about the security of certain types of information being processed in people's homes. Finally, some companies simply do not want their staff to be bothered by outsiders.

12) For example, Bull had cut back its number of teleworkers, and NEDO staff monitoring the area of telework have told us of instances where teleworkers have been dismissed. Others currently researching this field, such as Mike Brocklehurst and Paul Jackson, have also reported in personal communications how some firms such as insurance companies have frozen their plans for the moment.