Knowledge work in distributed environments: issues and illusions

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Although Finland is one of the most advanced and competitive economies in the world, with a sophisticated technological infrastructure, only four per cent of Finnish wage earners regard themselves as doing telework, and a further four per cent had tried telework. Empirical evidence of telework is presented in this paper.

The idea of telework, telecommuting (an American equivalent for teleworking) or, perhaps more adequately, distributed work, is far from novel. In its current meaning, i.e. work done independently of time and place with the help of ICTs, it has attracted interest at least since the 1970s, but in the past few years it has also been the target of renewed enthusiasm among academic scholars and policy makers. By definition, distributed work arrangements encompass many different alternatives to working at the traditional office, including satellite work centres, neighbourhood work centres, flexible work arrangements, generic offices (recently renamed as hotelling), and telework (Bélanger and Collins, 1998: 137).

If we take a closer look at ‘traditional’ telework, it is quite clear that this, one of the most vividly discussed forms of distributed work, has failed to live up to its initial promises. Much like the paperless office, it has proved surprisingly difficult for people to escape the constraints of the material world and to disperse work freely across time and space via digital networks. Whilst there are considerable discrepancies between different studies, most estimates on the prevalence of telework in different European countries and the US stand at well below ten per cent (Daniels et al., 2001: 1152–1153). In the most ‘advanced’ countries like Finland, the Netherlands and Sweden, estimates based on the broadest definitions put the figure at 15–17 per cent of the workforce, whereas the average for the EU countries is around six per cent (Korte and Gareis, 2002: 48–49).1 Clearly, this is a social innovation still in its infancy.

1 These estimates are from a widely publicised EcaTT survey conducted by Empirica in 1999. The results do not only provide data for home-based teleworking but also for mobile teleworking and work...
In the following, focusing on Finnish knowledge workers, I will present a critical assessment of the problems and possibilities involved in the implementation of telework. According to numerous studies, including the research upon which my analysis is based, telework still seems to be a marginal phenomenon, at least when compared to the boldest visions from the 1970s and early 1980s. The take-up of telework also seems to be progressing much more slowly than anticipated. However, this is not to say that telework is a futile innovation that has no future. On the contrary, as practically all relevant studies concerning Finland indicate (Hanhike, 1998; Luukinen, 1996; Pekkola, 1993), telework is a potentially useful way of arranging work in the future, possibly a win-win-situation for both employers and employees, offering more advantages than traditional arrangements.

However, in order to make telework a viable alternative to more orthodox work practices, it has to be understood that a transition towards distributed organisations comprised of people connected mainly via ICTs is a large-scale social and cultural transformation that will not happen overnight. Although telework is greatly dependent on technology, it is also a social, cultural and political innovation; the role of technology is to act as an enabling force rather than a driving one, as more and more scholars are suggesting (see, e.g., Stanford, 1997, for a review of existing literature). This is the focal point of the critique presented here.

The discussion below starts out with a description of the vision and theoretical idea behind the enthusiasm for telework. Next, I proceed to propose an empirically measurable definition of telework. It is argued that in the Finnish context it is plausible to restrict the use of the term telework to those wage earners who work at home under an employment contract. Third, I summarize the relevant empirical facts about telework and teleworkers in Finland. Fourth, I discuss challenges that will be presented by the future development of telework. Finally, the article concludes with a summary of some of the possible reasons why the large-scale implementation of telework seems to be such a slow and difficult process.

Since the body of knowledge on the subject clearly exceeds the scope of one article, priority is given to those studies that are related to knowledge work. Knowledge workers are defined here as wage earners whose jobs meet the following three criteria: (1) use of information technology; (2) independent design of important aspects of the job; and (3) at least upper intermediate vocational training (a college degree). IT users are defined as wage earners whose jobs do not meet either or both of the latter two criteria, while traditional workers (or, for brevity, others) are those who do not use information technology in their jobs at all. According to this definition by the year 2000, well over one-third or 39 per cent of Finnish wage earners could be classified as knowledge workers, compared to a mere 12 per cent in 1988 (Blom et al., 2002).

In addition to survey material I will also draw upon my experience from qualitative interviews representing five distinct business organisations. The interview protocol comprised the following organisations: a ‘global manufacturing enterprise’, a ‘telemarketing firm’, a ‘construction planning office’, a ‘modern wood processing factory’ and an ‘accounting office’ (see Appendix).

The early vision

The vision of telework grew up out of the oil crisis of the early 1970s, when western nations were forced to cut down on their energy consumption. In the US Jack Nilles et al. popularised the term telecommuting in a now classic study *The Telecommunications-Transportation Tradeoff* (1976), in which satellite offices (and to a lesser extent home-based teleworking) were proposed as a potential way of saving
energy costs. The argument was based on calculations which showed that white-collar office work or information occupations comprised the largest and fastest growing segment of the US labour force. Given the capability of modern telecommunications and computer technologies to efficiently produce, transmit and store information, it appeared that many information industry workers could telecommute, Nilles et al. postulated (p. 4).

In the discussion that followed, telework was soon put forward as a solution to a variety of individual, organisational and social problems. Telework was supposed not only to alleviate traffic congestion and save scarce natural resources, but also to increase employment opportunities for the disabled and other disadvantaged groups, reduce labour costs, increase productivity, and even improve the overall quality of life through increased job satisfaction and reduced stress. These were just some of the expectations harboured by many leading information society theorists, futurists and other visionaries.

The early and well-known visions of Marshall McLuhan, Yoneji Masuda, John Naisbitt and, of course, Alvin Toffler are obvious examples of the futuristic thinking that speculated with the fruits of technological ‘progress’. In The Third Wave (1980), Toffler envisioned a society of ‘electronic cottages’, a brave new world of work in which most of us would be working in the privacy of our homes through communication networks.

Although Toffler’s work is considered outdated from today’s perspective, unrealistic and populist claims still doggedly raise their heads when discussing the prospects of telework and other related possibilities of ICTs. A recent example from the vast literature is work by Ian Angell, Professor of Information Systems at the London School of Economics, who has toyed with the idea that in the foreseeable future the economic elite of knowledge workers, the ‘brave new barbarians’, will detach themselves from the restraints of earthly and perhaps even planetary physical boundaries. Work will be done any place, at any time; whatever best suits the individual.

According to Angell’s controversial book The New Barbarian Manifesto (2000), the most dynamic organisations of the information age will not let themselves get tied down into long-term office leases, since the office or desk is wherever it is possible to plug into the network. The argument sounds reasonable enough when we consider the development of mobile communication devices and portable computers (e.g., the technical possibilities offered by future generations of mobile phones or wireless local area network technology), but this is not enough for Angell. He goes on to ask why pay rent at all, ‘why not hold your meetings in the lobby of the best hotel in town, and for as little as the price of afternoon tea?’ (p. 43.) Bad news for traditional retail investors! Although Angell rejects the long-held view of ICTs as our benign liberator from mundane work, he sees unlimited possibilities for the very few who belong to the class of winners in global and increasingly mobile capitalism. The new barbarians will construct their own ‘smart regions’ where entrepreneurship, libertarian human rights and enlightened personalities prosper, Angell believes:

In future, work will still follow the phone number, but now mobile office workers are ‘road warriors’, taking their telephone numbers with them, anywhere. The contents of filing cabinets can be digitized and put in a networked file store, also accessible anywhere from a laptop computer. Organizations can communicate easily, effectively and cheaply with geographically remote locations. Teleworking, in all its various guises, is now being considered seriously by every company (Angell, 2000: 43).

Unfortunately, in the simplistic sense exemplified by writers like Toffler and Angell, telework is a persistent myth, not a conceivable reality, not even for the elite of top-notch professionals. The danger of popularised arguments like those outlined above is that they can lead us away from real and solvable problems associated with new forms of flexible working that ICTs either enable or facilitate. It is very likely that telework may offer many potential benefits for individuals and organisations alike, but there are always numerous obstacles hindering organisational reforms; for example, workers’ resistance to change, employers’ reluctance to trust their employees, fear of social isolation, etc.
Whatever explains the difficulties behind the required organisational changes, the fact remains that real teleworkers still constitute a small and most probably an elitist minority of the global work force, as we shall see later on. A critical review of existing empirical studies reveals that highly educated professionals employed in team-based project organisations are the most likely candidates to experiment with and stick to telework arrangements. However, before we get down to the numbers, there is an additional problem we have to deal with: unfortunately, the concept of telework is ambiguous and difficult to measure.

The concept of telework

In addition to the unrealistic hopes of being able to escape the confines of the modern workplace, it is also hard to come by a clear and concise definition of telework. In this sense the concept of telework resembles the idea of an information society or of knowledge work, which also remain somewhat vague in meaning. It is, however, possible to identify certain key aspects that are essential to telework arrangements. According to André Büssing (1998: 145), four main dimensions are essential to all organisational forms of teleworking:

1. Location
2. Time
3. Technical devices
4. Contract(s)

Following Büssing’s analytic distinctions, the location determines whether teleworking is performed in a fixed place or whether it is mobile by nature. The time factor reflects whether teleworking is done permanently or whether the work alternates between home and central office. The use of ICTs varies between on-line and off-line operation, i.e. whether the worker is plugged into the network or not. And finally, it must be taken into account that many different forms of contracting are applied to teleworking.

In my survey conducted in 2000, a representative number of Finnish wage earners (see Appendix) were asked whether they regarded themselves as doing telework, this being defined as work done at home under an employment contract. Thus, the location (home) and especially the respondent’s legal and contractual situation were emphasised. One may argue that without the latter demarcation, the concept would be far too comprehensive (Bakke, 1993: 78) and, furthermore, counting the numbers involved in informal teleworking is almost impossible (Gray et al., 1993: 20). This choice is also in line with recent efforts to formulate a common agreement on teleworkers’ rights at a European level. However, it was not possible to specify the nature of the contract in the definition because, according to the legislation, an employment contract does not have to be in any fixed format; it can be written or oral (Heikkilä, 1996: 37). Many different forms of contract can therefore be applied to teleworkers.

In the case of my survey, it was possible to use the word ‘telework’ without long elucidation because most Finns are demonstrably familiar with the term. According to a 1995 survey, three-quarters of the Finnish workforce knew what was meant by the concept; in an international comparison the corresponding figures were estimated at 23 per cent in Spain, 35 per cent in Italy, 37 per cent in Germany, 54 per cent in the UK and 59 per cent in France (Zamindar, 1995: 5). It has to be emphasised that in countries where the concept of telework is not as widely recognised as in Finland, the definition proposed here would not necessarily be adequate. Taking these considerations into account, the rationale behind the formulation chosen for the purpose of my study was an (un)easy compromise between as exact a definition as possible and clarity of wording. It is of course possible to formulate theoretically sophisticated conceptual constructions, but for empirical research the problem of making concepts operational always looms large.

Since the issue of working from a distance was only one part of a relatively long questionnaire, it was not unfortunately possible to fit in a question on the amount of
time spent teleworking versus ‘normal’ office hours, although this is certainly a matter of great importance (Steward, 2000). However, judging by other sources it would seem that only very few Finnish teleworkers work at home on a permanent basis (Luukinen, 1996). Alternating between home and head office seems to be the dominant and relatively established form of teleworking not only in Finland but elsewhere in Europe as well as in the US (Aichholzer, 1998). Compared to partial home-based teleworking, the use of telecottages, satellite or neighbourhood offices and other similar collectives is even less common. In Finland as well as in many other countries, experiments with telework centres have been unsuccessful. The same has happened in Sweden, which is where the first telework centres were established (Paavonen, 1999). At present then it seems that permanent telework, regardless of how it is organised, cannot be considered a viable substitute for conventional work arrangements, although it does for some add an important dimension to flexible work practices.

As a last remark, it has to be mentioned that self-employed persons, small entrepreneurs and the like who operate home businesses were not included in my study. The survey was strictly confined to wage earners, i.e. people who work for and get paid by another party. This choice is in line with a distinction often made in the research literature according to which traditional home-based work has to be understood as a separate category very different from telework (Felstead and Jewson, 2000). Likewise, people working overtime at home in order to catch up with work were not considered teleworkers because carrying work home is quite commonplace.

### Telework statistics

Keeping the above remarks in mind, it should be obvious that any efforts to measure telework are very much complicated by the lack of satisfactory conceptual tools. It follows that empirical estimates of its frequency in national contexts, not to mention its future prospects, vary widely. It is not uncommon for estimates of telework to differ by as much as a factor of ten. Since it is even harder to produce reliable international comparisons, the conclusions drawn from the following analysis should be treated with appropriate caution. However, Finland is an interesting case, perhaps pointing a way to the future, because of its position at the cutting edge of technological development and its highly educated workforce.

As Table 1 reveals, only four per cent of Finnish wage earners were engaged in telework arrangements in 2000. Another four per cent had tried telework, but nonetheless more than nine employees in ten (92 per cent) had never experimented with telework. Among knowledge workers teleworking is slightly more common than in the wage earning population in general.

Statistics Finland (1999) has used a definition of telework similar to mine. The agency’s definition of telework was formulated for the 1997 Quality of Work Life Survey, which drew upon an extensive set of questionnaire data from 1977, 1984 and 1990. The latest survey comprised of replies from 2979 persons who were interviewed directly. In the Quality of Work Life Survey the exact definition used to identify teleworkers was as follows:

<table>
<thead>
<tr>
<th>Knowledge workers</th>
<th>IT users</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teleworking currently</td>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Has tried telework</td>
<td>6</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Has never done telework</td>
<td>87</td>
<td>95</td>
<td>98</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>( n )</td>
<td>668</td>
<td>479</td>
<td>281</td>
</tr>
</tbody>
</table>

As a last remark, it has to be mentioned that self-employed persons, small entrepreneurs and the like who operate home businesses were not included in my study. The survey was strictly confined to wage earners, i.e. people who work for and get paid by another party. This choice is in line with a distinction often made in the research literature according to which traditional home-based work has to be understood as a separate category very different from telework (Felstead and Jewson, 2000). Likewise, people working overtime at home in order to catch up with work were not considered teleworkers because carrying work home is quite commonplace.
Telework is paid work done outside the actual place of work. Basically this type of work can also be done on the employer’s premises. The essential aspect here is that the arrangements are not confined to any particular time or place (Statistics Finland, 1999: 171).

Interestingly enough, this survey, conducted three years earlier than mine, produced the exact same results: telework was reported by four per cent of all employees, some 85,000 in all. However, only one per cent of the respondents reported having tried telework. On the other hand, the proportions of people who had agreed with their employers to do at least some of their work from home via computer was also measured in the Quality of Work Life Survey (extra work that is carried home was not considered telework). Defined in this way, telework in Finland increased almost fivefold during the 1990s. According to this definition, two per cent of all employees in 1990 were engaged in telework at least occasionally, in 1997 almost one employee in ten (8.5 per cent) reported doing telework.

Nevertheless, it is perfectly clear and obvious that telework still has a long way to go. Teleworking is rare even among knowledge workers, although it is often tasks requiring the manipulation, interpretation or communication of information that are considered the most suitable for teleworking. This view was clearly expressed by Nilles et al., (1976: 4) in their pioneering research on American telecommuters. However, as we shall see later on, it is likely that knowledge work is founded upon a culture of close collaboration, physical proximity among team members and a continuous flow of social interaction, all of which are hard to sustain over electronic media. Thus, in contrast to winged visions of pure virtual organisations, a transition to full dispersion of work activities may do more harm than good in organisations dependent on knowledge workers.

Empirical literature on the subject is scarce, yet thought-provoking. For example, France Bélanger et al. (2001) have conducted a small-scale network analysis of 110 distributed knowledge workers in six organisations. Their research indicates that a high need to engage in work-related communication has a significant negative effect on teleworkers’ productivity. According to the authors, the more telecommuters had communication links in their network, the lower their perceived productivity and performance: ‘It is logical to think that individuals who must communicate substantially with others in order to perform their tasks, and spend more effort to adapt and structure their communications, feel less productive in telecommuting environments, where such communications may represent greater challenges than in the traditional office’ (p. 169). Although interest in these issues is growing, there is a clear need for more research focusing on the ways in which organisational cultures operate in dispersed work settings (Ellison, 1999: 346).

In addition to the growing interest shown by academics, large numbers of Finnish wage earners are tempted to try out the idea of teleworking. If the amount of telework actually done today is still quite small, the popularity of the idea is surprisingly high according to both my and Statistics Finland’s research. In my survey, 32 per cent of the respondents expressed an interest in the idea of telework; according to Statistics Finland, a slightly larger proportion of the workforce (35 per cent) was interested in the possibility. It is hardly surprising that knowledge workers are keener than other wage earner groups: 42 per cent of knowledge workers would be interested in the possibility of doing telework, while the respective figures for IT users and traditional workers are 30 per cent and 17 per cent (Table 2). In the light of these numbers, with the possible exception of the group of traditional workers, at least lack of interest should not stand in the way of organisational reforms. Of course, it has to be remembered that many occupations falling in the category of traditional work are the least likely to be suitable for distribution (e.g., jobs in manufacturing and personal services).

Compared to actual telework, homeworking is a much more common phenomenon in Finland and elsewhere. Although only two per cent of the respondents in my survey reported working solely at home, a finding consistent with most other European countries, over one third (36 per cent) took work home at least some of the time. Most often this is extra work or overtime, which is not part of regular working hours. Again about one third (30 per cent) of the respondents say they use a PC in this kind of work.
On the basis of my data it is clear that working overtime in general and taking extra work home in particular is very common especially in professional occupations. Using a PC in home-based work is also something very familiar to upper white-collar employees, or those whom I prefer to call knowledge workers. The differences between the wage earner groups analysed here are huge: 59 per cent of knowledge workers carry work home, the figures for IT users and traditional workers are 19 per cent and 15 per cent, respectively. More than half (54 per cent) of knowledge workers use a PC for work at home, among IT users only 13 per cent (according to my definition traditional workers do not use information technology at all).

Unfortunately, not much can be said about teleworkers themselves on the basis of my survey. Even simple cross tabulations are often not reliable because the group of teleworkers is so small when compared with the number of all respondents (the same holds for the data produced by Statistics Finland). However, in line with other research dealing with similar problems, my data suggest that teleworkers in Finland are twice as often male as female, their level of formal education is high and their organisational position requires a high level of individual decision-making, autonomy and skills associated with professional occupations (see also Luukinen, 1996; Pekkola, 1997; Suomi et al., 1998). In this respect they differ very clearly from homeworkers, who are among some of the most disadvantaged labour market groups. Homeworkers have historically been a vulnerable group of people, keen to work, but unable to enter the labour market on equal terms with others because of social commitments which keep them home (Webster and Robins, 1986: 180).

Bearing all this in mind, it is impossible to say whether a sudden and widespread adoption of telework would mark a positive or negative change for those worker groups that are currently in disadvantageous positions. For example, some of the most optimistic visionaries have described teleworking as a solution to gender inequalities in the labour market, a possibility to diminish the friction between women’s contradictory roles as an integral part of paid labour, at the same time as being primarily responsible for the burden of domestic chores. However, equally convincing are those arguments which suggest that women are already disproportionately located in the peripheral, secondary labour markets with poorer conditions and narrower options than men; and teleworking (which in the case of women resembles traditional home-working) might have the potential to exacerbate this trend by marginalising women even further within the workforce (Haddon, 1999: 29).

Nevertheless, whereas in some other countries telework is associated with peripheral worker groups, it might well be speculated that in Finland teleworkers represent an economic and social elite of the information age. Although definitive answers are still missing, it is likely that teleworkers’ labour market position will continue to strengthen with economic and technological development in other European countries, too. As Lars Qvortrup, one of the most prominent European telework researchers argues:

The dominating current trend in Europe seems to be that telework is performed by skilled information workers using computers and telecommunications for flexible work, i.e. working part time

<table>
<thead>
<tr>
<th></th>
<th>Knowledge workers</th>
<th>IT users</th>
<th>Others</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>Yes</td>
<td>42</td>
<td>30</td>
<td>17</td>
<td>32</td>
</tr>
<tr>
<td>No</td>
<td>34</td>
<td>42</td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>Don’t know</td>
<td>24</td>
<td>28</td>
<td>34</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>(n)</td>
<td>616</td>
<td>498</td>
<td>308</td>
<td>1,422</td>
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at home, part time in the office, and also bringing their portable computers on trains, aeroplanes, and to hotels, or visiting intelligent buildings (Qvortrup, 1998: 34).

A similar picture emerges from the group of employees who consider it worthwhile to experiment with teleworking. According to my results, highly educated professionals are the most likely candidates for future telework arrangements. In this respect there is no difference between men and women. Other sources, it might be added, furthermore indicate that small-sized team-based organisations are more eager to experiment with telework than larger companies. According to Reima Suomi et al. (1998), a survey-built database from the FET (Finnish Experience with Telework) project from 1994–1995 reveals three main factors determining whether or not an organisation will adopt telework:

1. The greatest predictor for the implementation of telework is the existence of an appropriate information technology infrastructure.
2. Second, organisational size is important in predicting whether or not a firm will implement telework. The larger the size of the organisation, the less likely they are to have telework arrangements.
3. Teamwork is positively related to the practice of telework. Teamwork structures may allow employees to overcome fears of social isolation that might result from teleworking. (Suomi et al., 1998: 332.)

We can draw two important conclusions. First, individually speaking, professionals and other knowledge workers with a strong educational background are the most likely to engage in telework arrangements, albeit not on the sort of scale often predicted in the research literature. Second, from the point of view of organisations, structurally flexible team-based enterprises provide the most fertile soil for the growth of telework. However, it is likely that pure virtual organisations will remain rare because no amount of technology can substitute for the intense face-to-face interaction that is necessary in collaborative teamwork.

Especially in countries like Finland, the lack of technological infrastructure is only a minor problem. Instead on focusing on technological solutions, as the authors cited above imply, we ought to adopt a more ‘need-driven’ approach to telework (Suomi et al., 1998: 335; see also Suomi and Pekkola, 1999). As I have already implied, close collaboration with peers is important for knowledge workers, but they also need uninterrupted time free from outside distractions: a part-time telework arrangement could provide both. However, this presents major challenges for individuals and organisations alike. In the following section I turn to examples derived from my case studies that highlight some of the numerous problems that should be addressed when considering the option of people moving out of the office and into their homes or mobile offices to work.

The challenge

Given Finland’s highly developed technological infrastructure, the success of companies like Nokia and its subcontractors, individual personalities like Linus Torvalds (inventor of the Linux system) and the high overall standard of education in the country, why is it that telework has, as reliable statistics indicate, never really got off the ground? Why is telework still a marginal phenomenon, despite the fact that it may offer many benefits to organisations in particular?

Although this question ought to be addressed in relation to different organisational settings, it may be concluded on a general level that the integration of dispersed work activities requires new forms of cooperation, coordination and control (Jackson and van der Wielen, 1998: 14). From the point of view of the sociology and psychology of organisations, the use of electronic interfaces as a means of social interaction creates a restricted space for fruitful and constructive communication. The obvious paradox is the problem of how to re-establish the basis for effective human communication in the virtual workplace, where the richness and variety of interaction associated with physical presence is, by definition, denied (Gillespie and Feng, 1994: 268). For example,
most non-verbal signs and gestures will be lost when information is codified into short
e-mail messages or phone calls. Even video-conferencing can hardly be considered as
a substitute for the physical co-presence of individuals. This is highly problematic in
situations where interpersonal conflicts are prone to arise. When the medium does not
allow individuals to express and respond to appropriate social clues, the risk of mis-
understandings increases.

It is also unlikely that ‘tacit knowing’, a concept first elaborated by the philosopher
Michael Polanyi, will evolve and transfer in the best possible ways between individ-
uals and groups when an electronic interface defines the boundaries of human inter-
action. As Polanyi (1966) put it in his famous phrase, ‘we can know more than we can
tell’ (p. 4). It is probably only a fraction of our knowing that is explicit in nature, while
the rest remains hidden in our actions and habits, in the way we do things without
knowing exactly how we do them. To continue with Polanyi’s idea a little further, the
use of an electronic interface may not only restrict but in certain situations completely
inhibit attempts at explicating and disseminating our most intimate knowledge and
feelings. Although face-to-face interaction has its own natural limitations, the fact
remains that it is the richest communication channel available.

The reasons above may explain why so many workers are intuitively opposed to
the idea of telework. Interestingly, some of the knowledge workers I have interviewed
were quite eager to describe the importance of tacit knowledge. Especially the workers
interviewed at the global manufacturing enterprise and engineering office remarked
explicitly that being physically close to other team members is essential for their work.
For example, one of the employees said that e-mail is in many cases convenient, but
nothing beats the experience of being able to shout to your teammate over the wall
and ask for assistance:

Our team has been running for five years, and you can say we have a great team spirit. . . . We are
used to sitting close to each other so that the whole group is within shouting range. That's how
the team works so well (Sales manager, manufacturing enterprise).

As has been reported earlier in the research literature (e.g., Bentley and Yoong, 2000),
the need for informal interaction emerged as a central feature of knowledge work in
my study as well. In the case of the manufacturing enterprise, telework was consid-
ered a viable alternative primarily in circumstances where it is necessary to have quiet
and uninterrupted time. Work process documenting, reading and programming were
highlighted as the most prominent examples of tasks that were suitable for telework-
ing; yet it was difficult to make the actual decision not to show up at the office:

It's much better to do your programming in a quiet and peaceful place, rather than in an open-
plan office where the phones are ringing and other interesting tasks are available. But there is a
certain drawback to staying at home, you don't get to communicate with others . . . (Process
manager, manufacturing enterprise.)

Similar observations were made in interviews with workers at the engineering office
specialising in construction architecture and planning. Although construction design
is a prominent example of mobile knowledge work (visits to customers, subcontractors and construction sites are frequent), the actual planning process is dependent on
 colaboration between a relatively stable team of specialists. Therefore a significant
amount of physical co-presence is necessary. The manager interviewed emphasised
the benefits of open-plan office architecture and the physical proximity of workers. He
could not imagine distributing his organisation:

Our work requires a lot of communication and collaboration, and you cannot get it done simply
on paper or by transferring bits [digital files]. We have to be present in our mutual meetings and
conversations (Manager, engineering office).

Some interviewees expressed their fear of conflicts between work and family obliga-
tions. In particular, it was thought that successful teleworking would not be possible
in the presence of small children at home. Individual life cycle stage is obviously an
imperative factor when considering a move from office to home, although this is not
much appreciated in technological readings of telework. In the research literature,
however, this view is unanimously shared by those who have studied female teleworkers. For example, Kay Devine et al. (1997: 101) say it is a clear misconception that working at home will assist in childcare arrangements, especially with preschoolers. In addition, some feminist writers have made the important point that futuristic imaginings of telework tend to construct a peculiarly male world premised on the assumption of little or no responsibility for the care of others (Armstrong, 1999: 47). In more general terms, it has also been remarked that both work and private aspects of households impose competing demands on teleworkers, resulting in possible conflicts and strains from alternating quickly from one role to another (Haddon and Silverstone, 1994).

It seems then that the decision to take up telework is as much dependent on the nature of work as it is on individual traits like family status. Clearly, both physically fixed and distributed forms of work have their benefits and inconveniences. For the above reasons, none of the people interviewed regarded telework as a viable substitution for normal work, except perhaps occasionally. Even in the case of the manufacturing enterprise, which had a specific corporate policy that allowed employees to work from home one day per week if they chose to do so, telework was considered as just one minor dimension of flexible work practices.

In the telemarketing firm the employees were even more sceptical about the benefits of telework. In fact, the interviewees were clearly startled when they were asked what they would think about switching to telework. One female worker quickly replied that there is no way she could feel good about working from home. She clearly felt a need to maintain a clear boundary line between work and non-work duties:

Personally, I prefer to come here to my office, because in my opinion home is home, it is a place for rest and family (Sales negotiator, telemarketing firm).

The idea of switching to home from office was inconceivable for all other interviewees at the telemarketing firm as well. These responses were quite understandable in view of the conscious and considerable efforts made by the employer to create a good team spirit and good working conditions. Unlike some other services in this sector, and call centres in particular, this employer provided an exceptionally modern and pleasant office environment and some additional benefits like extra bonuses, social activities and even household help for distinguished senior workers. It is possible that in cases like this, the fear of losing fringe benefits is the main reason why workers are reluctant to turn to telework.

In other case organisations different yet equally important problems were raised. Concerned about potential data security risks, the manager and owner of the accounting firm had forbidden working from home and even carrying work-related documents home. This was on grounds of the possibility of fraud, abuse or accident, no matter how remote the possibility:

I have said no to teleworking. Juridical issues are involved. I do not like to see clients’ papers carried home. Professional secrecy and the like might be endangered. Or if people have children at home, they may tear up the papers or pour coffee all over them, and so forth. At my behest nothing is carried home (Manager, accounting firm).

Working on the customers’ premises from time to time is of course another matter altogether; this is in fact common practice in the accounting business. Nevertheless, considering the widely publicised accounting scandals (Enron, WorldCom, etc.) that were shaking the global stock markets at the time of the interview, the manager’s policy could hardly be regarded as overly cautious. In the accounting business it is crucial that the customer relationship is founded upon trust and a strict code of professional ethics. The most important lesson to be learned from this case is that data protection is a much wider issue than just a technological one. Efficient firewalls and anti-virus software are crucial today, but as long as discreet documents are filed in paper form or invaluable materials and equipment are being handled, traditional control systems and precautions are likely to remain in place.
Interestingly, in the wood-processing factory workers responsible for the purchase of the raw material (i.e. negotiating sales with individual forest owners) were the most positive examples of successful distributed work. By necessity their work had always been highly mobile, but in recent years the development of ICTs had added a new twist to traditional work practices. As well as having mobile phones and laptop computers with portable printers, most of the workers also worked at home or in a small satellite office. This meant they could reduce unnecessary commuting and adjust their schedules to their customers’ needs. In this particular setting the work was not only mobile but also effectively distributed between different locations in a combination that was considered functional from the point of view of individual workers, customers and the employer. As a result of this arrangement, it was thought the flexibility of purchase agents’ work had significantly improved. Only in situations requiring face-to-face interaction was distribution criticized:

Of course, face-to-face interaction suffers [in distributed work]. Videophones are not a reasonable option. . . . Sometimes it is difficult to keep in touch with certain persons who are somewhat introverted. But I would not consider this a problem for us (Purchase manager, wood-processing factory).

Especially in the case of organisations like the telemarketing firm, there is still one aspect that is of utmost importance: the exercise of control over the work process. As in all sales work, the team spirit in this organisation was intensely competitive. Actual monthly sales figures for each competing team were posted on a chalkboard for everyone to see and compare. Both individual and group bonuses were determined according to the volume of sales completed. Although it would be too simplistic to suggest that monetary rewards were the only motivating factor for the workers in the telemarketing firm, it is very likely that management preferred to keep up a competitive atmosphere:

I’m sure there are some people who could do their job at home. But we want to keep control and in that way guarantee how the work is done. . . . On the other hand, when the team spirit is high, that creates positive synergy (Sales manager, telemarketing firm).

In the context of organisations like the manufacturing enterprise, the issue of surveillance is obviously more complicated because there the employees are specialists in different fields of expertise, and management cannot be fully on par with their subordinates. In most organisations the fact still remains that it is easier for management to control the work process when people are physically close to each other or otherwise susceptible to monitoring. It is probably for this reason that management may feel reluctant to take a chance with telework experiments. Yet, running a successful business is about taking calculated and conscious risks. Without any risk of failure, you cannot make a profit. The same applies to new forms of work. This, however, is easier said than done. If telework is to be adopted on a large scale, a paradigm shift is needed in managerial norms and attitudes (Ellison, 1999; Nilles, 1998). Management has to shift its focus from traditional means of controlling work processes and employee behaviour to the evaluation of performance and end results.

In addition to the problems referred to above, some of the persons interviewed were concerned about the prospect of social isolation. Although this aspect of telework is often mentioned in the research literature, relatively little is known about the consequences of isolation or other important issues related to occupational health and safety (e.g., designing ergonomically sound telework environments, managing working time and avoiding unnecessary stress). In some case studies teleworkers have said it is difficult for them to justify their free time when work is invisible to others and when free time is permeable to employers’ demands (Steward, 2000: 60). In the worst scenario, telework embedded in a less than optimal psychosocial environment could lead to a ‘workaholic culture’, shattering the balance between work and private spheres of life. Long working hours and badly designed physical settings could accordingly result in adverse health consequences (Huuhtanen, 1996).

These are just some examples of the many difficulties surrounding telework experiments that should be taken into consideration when discussing the potential prob-
lems and possibilities of distributed work, including the legal rights and responsibilities of teleworkers and their employers. To conclude, we can now proceed to our final summary and draw together the practical implications of the preceding analysis.

Summary and implications

5 p.m. Time to call it a day. You leave notes for yourself on what has to be done tomorrow and then e-mail your supervisor at the main office to tell her you will be going to the meeting on Friday. You leave the office, check on your 12-year-old watching TV in the family room, and head outside to do some gardening. It’s been a good day at work! (Devine et al., 1997: 103–04.)

Unfortunately, the above quotation is fictitious, as the authors themselves convincingly demonstrate in describing the case of Canadian teleworkers. There is no teleworking revolution underway. What we are likely to see is an evolutionary development towards increased flexibility as a long-term result of the information technology revolution and gradual absorption of teleworking into the mainstream of normal working practice (Gray et al., 1993: 22). For years to come, working free of spatial and temporal restraints will remain a privilege for only a small minority of wage labourers—probably even fewer teleworkers experience this new form of work solely in a positive light, as involving no problems whatsoever. Like all work arrangements, telework too has its pros and cons. Table 3 summarises some of the most important possibilities as well as potential problems associated with distributed work arrangements.

To overcome these and other possible obstacles to the use of telework, there are several policy recommendations that should be considered (for step-by-step guidelines for teleworkers and their managers see, e.g., Gray et al., 1993; Nilles, 1998). Here I will raise only two main concerns that came up repeatedly during the course of my case studies.

On the one hand, both employers and employees experiencing telework arrangements should formally agree upon the legal rights and appropriate working conditions of teleworkers. A teleworking initiative should never be imposed, and only those who show the right aptitude and desire to work this way should be selected as teleworkers (Coulson-Thomas, 1991: 31). Without a mutual understanding, a telework initiative is unlikely to be successful. Especially in countries like Finland where trade unions have a strong footing in regulating the labour market, the contractual nature of telework should be emphasised from the very outset.

On the other hand, in order to smooth out any problems that might occur, only a part-time telework arrangement, specifically tailored for a selected sample of potential teleworkers, is advisable, at least in the initial phase of organisational change. An organisation-wide solution should only be sought after the first experiences have been analysed. It is also likely that in the long run, partial telework could very well be the best alternative for most organisations, minimising the need for extra education, support and surveillance of teleworkers, to name just a few potential problem areas.

If, however, a full-time telework arrangement is implemented, it should be ensured that teleworkers are provided with appropriate technical and educational support. Extra measures to compensate for isolation and to retain professional relationships are advisable. As a necessary minimum, there should be opportunities for regular meetings and engagement in informal social activities. In this respect the personality of individual employees should also be taken into account when selecting prospective teleworkers. The key here is to facilitate necessary social exchange while paying less attention to unnecessary interaction (Nilles, 1998: 36).

These and other possible problems notwithstanding, it is reasonable to conclude that the opportunities and benefits telework could offer far outweigh its potential risks. However, as I have suggested, partial telework may be advisable for most organisations. In this way, a compromise between traditional and still-experimental distributed forms of work might be achieved—and perhaps the best of both worlds could be combined.
Appendix

The empirical results presented in this article are based on research funded by the Finnish Work Environment Fund and the Academy of Finland. The survey material, representing Finnish wage earners aged 18–65, was based on random sampling obtained from the Finnish Tax Administration ($n = 1,775$). The data was collected in Spring 2000. A postal questionnaire was used. The response rate was around 55 per cent. The survey drew upon similar sets of questionnaire data from 1988 and 1994 (for more details, see Blom et al., 2002). In addition to survey material qualitative interviews were conducted in five knowledge-intensive business organisations in 2001–2002. In addition to the work to trace the histories and public visibility of the companies, informal discussions and non-participant observation, 21 semi-structured interviews were conducted following the common guidelines of case study research (see, e.g., Yin, 1989).

<table>
<thead>
<tr>
<th>Table 3: The pros and cons of distributed work arrangements</th>
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<tbody>
<tr>
<td><strong>Pros</strong></td>
</tr>
<tr>
<td><strong>Individual level</strong></td>
</tr>
<tr>
<td>More flexible working hours; improved productivity and profitability of individual workers; stronger employee job satisfaction, motivation and positive occupational identity</td>
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<tr>
<td>Home provides a peaceful work environment free from interruptions</td>
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<tr>
<td><strong>Organisational level</strong></td>
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<tr>
<td>Positive effects on employment by helping to match supply and demand</td>
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<tr>
<td>Stronger relations of trust between employers and employees; employees are given more autonomy and responsibility; employee retention improves</td>
</tr>
<tr>
<td>Telework creates a dynamic and modern organisational image</td>
</tr>
<tr>
<td><strong>Social level</strong></td>
</tr>
<tr>
<td>New job opportunities created for disadvantaged labour force groups; entrepreneurial activity is encouraged; geographical inequalities are reduced</td>
</tr>
<tr>
<td>Positive environmental effects through by reduced commuting-related traffic problems and urban congestion</td>
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References


