

NETWORKS AND NEW WAYS OF WORKING : HUMAN ASPECTS*

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Abstract: The presentation reviews the existing research on the nature and extent of networking and more precisely teleworking in USA and Europe. Teleworking is a new form of working still in a process of evolution. The article gives a large definition of teleworking (part I) and develops what kind of technology is used (part II) and what are the information workers (part III). The social and economic implications of teleworking are detailed such as transportation issues and trade and industry issues (part IV). The article concludes on the human aspects of teleworking (part V).

I. Introduction: How to define teleworking?

Networking and by extension teleworking are not a single, easily-measured phenomenon but, on the contrary, comprises a range of different types of employment which have in common only the fact that they involve some form of relocation of work which has been facilitated by the combined use of information and communication technologies. These falls into two main categories :

1. Individualised forms of teleworking, which involve work carried out away from the employer's premises. These may include :
 - a. home-based teleworking
 - b. multi-locational or mobile working
2. Collective forms of teleworking, which take place on non-domestic premises controlled by the employer or a third party. These forms include :
 - a. the relocation of back-office functions to functionally specialised remote sites, which may be described as satellite offices or call centres
 - b. the subcontracting of work to telecottages or other organisations (which may also be known by other names such as "telecentres", "outsources centres", "community resource centres", "computer ressource centres" or "office bureaux")

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- c. the development of computer-supported distributed team working within multi-site organisations, rendering many functions which previously had to be carried out on a single site locationally independent
- d. the use of telematic links to develop collaborative working relationships between firms, creating new forms of networks and partnerships which are sometimes known as "virtual enterprises"

There is no universal definition of teleworking which can be rigorously and unambiguously applied. The word is used in a variety of different senses in different contexts. Indeed, since this is a comparatively new form of working still in a process of evolution, it would probably be undesirable to attempt to impose a rigid form upon it.

The most useful starting point for any research on the subject is a recognition that the introduction of new information and communication technologies has opened up a range of new options in the organisation of work. Either directly or indirectly, these have facilitated changes in :

- the location of work
- the organisation of working hours
- the combination of skills required to deliver particular tasks
- contractual arrangements
- organisational structures

Teleworking can be seen as a word which describes the results of some of these changes. It is regarded as one of a number of types of flexibility rather than any specific form of work. Five major types of teleworking appear, from the available evidence, to be significant :

1. Home-based teleworking which in turn breaks into :
 - a. teleworking which is based partly in the home and partly on the employer's premises which may be termed "part-time home-based teleworking".
 - b. teleworking which is based entirely in the home and which is carried out exclusively for a single employer or intermediary, which may be termed "full-time home-based teleworking for a single employer".
 - c. teleworking which is entirely based in the home but which is carried out by freelance workers, for a number of different employers or clients, which may be termed "freelance home-based teleworking"
2. Mobile teleworking
3. Relocated back-office functions (intra-firm teleworking)

4. Out-sourced back-office functions, whether carried out from telecottages or telecentres or by commercial sub-contractors (inter-firm teleworking)
5. The Use of telematic links between organisations

II. The technology use

Some attempts have been made in the United States to estimate the number of teleworkers from the prevalence of home-based information technology and the uses to which its owners say it is put. During the 1980s, for instance, a Gallup poll found 40 % of home computer owners saying that they used them for "business or office homework" with a smaller proportion (27%) citing "business in home use". Another survey, by Yankelovitch, Skelly and White, found 33% of home computer owners stating that their primary use was for business. An IBM survey found that 60% of its computers which sold for \$2,000 or more were being used in the home and that over half of these home computers were being used primarily for business-related purposes. A further 11 % were being transported between home and office.

Olson's survey of 598 Datamation readers found that 64,5% of these data processing professionals sometimes worked at home in addition to their regular office work, 12,4% did it as an occasional substitute and 6,2% worked exclusively from home.

More recently, attempts have been made to estimate the numbers of mobile workers from sales of portable technology (such as mobile phones and lap-top computers. In 1994, for instance, New York-based consultants Link Resources drew on such information (along with other sources) to produce their estimate that there are currently seven million mobile teleworkers in the USA, with number predicted to grow to 25 million by the year 2000.

III. The information workers

Information workers are defined by the US Department of Transportation Work as individuals whose primary economic activity involves the creation, processing, manipulation or distribution of information. Information workers are projected to increase from 73 million in 1993 to 80 million in 2002 and exceed 85 million by 2010. Onto these projections is then projected a further estimate of the likely growth in teleworking. It is furthermore assumed that the percentage of telecommuters working from home will decline from 99% in 1992 to about 50% by 2002 with a corresponding percentage increase in those working from

telecommuting centres and that the average of days per week of telecommuting will increase from between 1 and 2 in 1992 to between 3 and 4 by 2002.

IV. Social and economic implications of teleworking

1. TRANSPORTATION ISSUES

Transportation issues are of central importance in any discussion of the broad social and economic implications of teleworking. The earliest literature on the subject focused almost exclusively on the opportunities teleworking creates for substituting electronic communication for physical travel. It may comprises :

- Reduction in petrol consumption and of the number of vehicles miles, - The influence of telecommunications on traffic and transport
- The effects on energy and the environment
- The energy cost of installing the necessary telecommunications infrastructure,
- The cost of delivering physical goods and services (which might otherwise be accessed in city centre by office workers)
- Higher use of home-based distance learning, home banking, videotex, teleshopping and home-based leisure activities using multimedia computer applications

And also :

- higher use of home-based teleworking, teleconferencing and electronic data exchange

2. TRADE AND INDUSTRY ISSUES

Teleworking offers the promise of becoming an important instrument for improving competitiveness and generating new business and employment opportunities : the technologies involved can form the basis of new industries and services ; the productivity and efficiency of enterprises can be improved increasing their market share ; new forms of teamworking, collaboration or telepartnership can be open up ; relocation of work in economically deprived regions can be facilitated, diversifying local economies, creating alternatives.

V. Human aspects

The human aspects of teleworking are of different types : it has implications on working time, on unemployment, on the development of services, on productivity, and on the equality of opportunities: Indeed, teleworking can facilitate the restructuring of working hours making easier to introduce part-time working, job-sharing and other flexible forms of work. One point observed is the greater

productivity of teleworkers: the increase is about 20 %. A teleworker produces a report more quickly than a comparable worker based in an office.

- It could help to reduce unemployment and bring to the labour market groups which were previously excluded because they were unable to offer themselves for full-time work.
- The new technologies can bring about improvements in the quality of life, through the introduction of new services such as telemedicine, telebanking, teleshopping.
- Equality of opportunities are another aspect. For example :
 - Disability : people with disability are a group which stands to benefit enormously from the new opportunities to work remotely opened up by teleworking.
 - Sex equality : without the opportunities to be teleworkers many of female would not have been working at all : they combined work with their domestic responsibilities telehomeworked offering time flexibility. On the other hand, there are no promotion prospects and their pay levels are lower than for comparable on-site staff.

Conclusion

There is a strong case to be made for joint research on individual forms of teleworking, which could be satisfactorily quantified by means of a general population survey with supplementary information.

Despite an extensive literature on globalisation, the relationship between the introduction of new information and communication technologies and the relocation of employment remains an under-researched field, and that there is a need for further research in this area, including employers surveys, case-studies and secondary analysis of existing trade and employment statistics.

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