

COMMUNICATION PATTERNS IN TELEWORKING

John W. Bakke

Telenor Research
P.O. Box 83, N-2007 Kjeller, Norway

E-mail: john.bakke@tf.telenor.no

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ABSTRACT: This article presents findings from a study of teleworking in Norway, and discusses teleworking as an arena for human-computer interaction and mediated communication, with special emphasis on communication patterns, media choices, and the teleworkers' "communications milieu". A central theme in the discussion is the importance of learning about human-computer interaction and mediated communication from "real-life situations" where technologies are deployed for solving specific problems.

INTRODUCTION

Teleworking is a central theme in discussions of the future of work. The interest in teleworking is, among other factors, motivated by developments in information- and communications technologies allowing — in principle — a majority of tasks regarding information processing to be performed at an arbitrary location. Thereby, teleworking is a potentially interesting arena for studies of human-computer interaction and mediated communication.

The idea of moving work to people rather than people to work is not a new one. Besides the long history of industrial homework, teleworking in its modern form has been a recurrent issue since the energy crisis in the early 70's, at a time when home computing was becoming a realistic opportunity. At first, teleworking was considered a way of reducing road transportation (the 'telecommunications-transportation tradeoff', Nilles *et al.* 1976). A number of optimistic predictions were made, indicating a substantial growth potential. Teleworking was also seen as a way of re-integrating work and family life, leading towards a "home-centred society" (Toffler 1980), or as a vehicle for dissemination of knowledge of information technology to local communities (cf. Hetland *et al.* 1988).

In spite of, or perhaps because of these ambitious scenarios and predictions, teleworking never seemed

to go beyond plans and experiments, and teleworking vanished from the political agenda. On the domestic scene, however, an un-monitored development took place, with the establishment of home-offices and home-based work, but with few references to the discourse on teleworking. — A series of interviews with teleworkers displayed a variety of reasons for starting teleworking schemes, whereas a common theme was the *post hoc* discovery to consider themselves as 'teleworkers' (Bakke 1994).

In the 90's, once again teleworking is on the agenda — as a way of easing traffic congestion and air pollution in urban areas, or a way of slimming expensive office space. The recommendations to the European Council for developing "Europe and the global information society" (the Bangemann Group report), as well as the Norwegian initiative for establishing a National Information Network, identify teleworking as a major arena for growth and welfare, and a way of harvesting investments in information technology.

The literature on teleworking is well stocked in estimates of potentials, manuals for organizing teleworking, and case studies, whereas there is a shortage of more comprehensive studies. This was the motivation for the establishment of a multi-faceted research project at Telenor Research (formerly Norwegian Telecom Research).

TELEWORKING IN NORWAY

Except for a notion of "geographical distance between employer and employee", teleworking is a somewhat nebulous concept. There is a fairly uncontroversial core of the definition, covering for instance the telecommuter's high-tech home office, and there are equally uncontroversial examples no one would consider as 'teleworking'. Between these extremes, there is a large number of work arrangements hard to characterize, like the part time home worker for whom the telephone is the most advanced information- and communications technology.

For the purposes of this project, a wide definition of teleworking is deployed, including part time and full time arrangements, and employees as well as self employed. The definition has basically three elements: teleworking is performed at a distance from employer, it is a source of income, and there is an agreement or (implicit) understanding between the parties regarding this way of working (cf. Bakke 1993). This definition highlights the *organizational* aspects of teleworking.

Several authors add a formulation like 'substantial usage of information technologies' to their definition. This addendum may be justified for emphasizing the potentials provided by recent technological developments. On the other hand, the addendum proves to be too vague as a criterion for identification of teleworkers, a.o. due to the obvious problems of establishing threshold levels for 'substantial usage'. Instead, in this project, 'usage of technologies' is an important topic for studies.

The research project at Telenor Research includes a survey of attitudes towards and practice of teleworking in the working population. This survey is based upon telephone interviews with a representative sample of 8500 persons, thereby also providing a representative sample of Norwegian teleworkers (a presentation of this study is given in Bakke 1995). The employers' view is studied in a supplementary survey of managers in industry.

The surveys clearly indicate that teleworking has become a numerically important reality. According to this wide definition of teleworking, approximately 9% of the working population are 'teleworkers' in the sense they perform a certain amount of work-related tasks at home. The majority of the teleworkers combines work at home with work at a

another work place. There is a fairly equal distribution among the sexes — 60% men and 40% women.

Approximately two thirds of the teleworkers are employees, and one third self-employed. The teleworkers represent a multitude of occupations, the more important ones were education and research, managerial work, office work, sales, and accounts.

Their motives for becoming teleworkers differ. Common explanations were the problem of getting all done during ordinary working hours, the wish to take better care of family and children, and the desire to get more freedom in work.

The teleworkers seem to thrive. The majority reported a low level of stress when comparing with 'ordinary work', and they reported few problems in concentrating while working at home. The concern that teleworkers would become detached and isolated, did not find support in this material, as the teleworkers felt a belonging to their (other) work place. Finally, they reported that teleworking gave more time with family and friends, even though there seemed to be problems in separating work and leisure.

COMMUNICATION PATTERNS IN TELEWORKING

For teleworking to be successful, the geographical distance between employer and employee has to be overcome. This may be accomplished through the physical movement of either party, or through some kind of mediated communication.

The potential for teleworking, in terms of information- and telecommunications technologies, is large. The penetration rate for telephony is high, and our research project showed that two thirds of the population has one or more rooms that might be used as a work place, and of these, 50% already had a phone outlet on this location. One third of the population had access to a PC at home, of these 14% also had a modem (Bakke 1995).

An initial survey of the usage of information- and telecommunications technologies in teleworking was performed in the study of managers in industry. When asked about usage of technology among the company's teleworkers, the main categories were

— not surprisingly — telephone, PC, fax and cellular phone.

The survey of the teleworkers' attitudes and behaviour elaborates this initial picture of communications patterns in greater detail. In order to bridge the distance between employer and employee, telephony is the most common method, followed by showing up in person, post and telefax. Regarding technologies and services deployed in their work as teleworkers, telephony proves to be the undisputed number one, followed by personal computers, the postal system, cellular telephony, answering machines and copiers.

The study demonstrates differences in communications behaviour between teleworking employees and self-employed teleworkers. In general, the self-employed report a higher level of usage of most types of information- and communications technologies, compared to the employees. A notable exception is telephone conferencing, where the employees have a higher score.

In studies of communications patterns, the *lack* of usage of information- and communications technologies is also of great interest. The surveys confirm that a number of teleworkers do not deploy any communications technologies at all. One implication might be to reconsider the conceptions of teleworking. — Whereas teleworking is often depicted as a rational usage of recent developments in information- and communications technologies, these findings indicate that teleworking also might be understood as a way of obtaining peace, quiet and concentration, away from the work place. This interpretation is supported by interviews with teleworkers, for whom teleworking sometimes was a way of getting away from a hectic office (Bakke 1994).

TELEWORKING AND HUMAN-COMPUTER INTERACTION

Teleworking is potentially an interesting arena for studies of ergonomics and human-computer interaction, motivated by its specific organizational characteristics, as well as the sheer number of teleworkers. Teleworking, however, is a conglomerate of various practices; some teleworkers are employees and some are self-employed, their motives for becoming teleworkers as well as their usage of tech-

nologies differ considerably, hence, the wide variety of teleworking situations and -technologies might make it difficult to draw specific conclusions regarding teleworking and human-computer interaction. Instead, the variety of situations might be taken in support of the obvious benefits of systematic laboratory studies of selected, isolated aspects. On the other hand, 'real-life situations' like teleworking has several properties that laboratory studies in human-computer interaction and mediated communication hardly will be able to simulate.

One of the benefits of real-life situations is the large degree of realism in their practices through a task-orientation towards a meaningful goal, not towards abstracted aspects of technologies and applications as defined by a researcher. Further, real-life situations provides important information about choices regarding usage of a specific technology, and choices between technologies, like the media choice of the teleworkers.

Several aspects of teleworking are quite different from other varieties of office work. In addition to the distance between employer and employee, teleworkers typically maintain two, often differently equipped work places, and typically there is a lower level of service and support at the home office.

Work implies cooperation, coordination and division of labour. The distance between employer and employee turns teleworking into a challenging case for studies of cooperation over distance.

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