# MOBILE COMMUNICATION AND WORK PRACTICES IN KNOWLEDGE-BASED ORGANIZATIONS

Pertti Hurme
*Finnish University Network of Communication Sciences
& University of Jyväskylä, Finland*

Abstract: *This paper examines the role of mobile communication, mobile tools and work practices in the context of organizations, especially knowledge-based organizations. Today, organizations are highly complex and diverse. Not surprisingly, various solutions to incorporating mobile tools and mobile communication in organizations have been devised. Challenges to technological development and research on mobile communication are presented.*

Keywords: *mobility, mobile communication, ICT, work practices, knowledge-based organizations.*

## INTRODUCTION

For carrying out work, people tend to organize themselves, often for the simple reason that together they can do things that they cannot do alone. People organize themselves into groups, communities and networks of varying size and cohesion. An organization is often defined as a group of people who work together. Organizations show much variety. They can be for instance large or small, hierarchical or flat, centralized or distributed.

There are many types of organizations. One way to analyze them is through the use of metaphors, which according to Morgan (1986) shape the way in which organizations are conceptualized and understood. The machine served as a metaphor for the hierarchical and centralized organizations of the industrial era. Later on, other metaphors emerged, reflecting changes in societal values: organizations as living systems in the 1970s, organizations as cultures in the 1980s. In the 1990s, the organization-as-computer metaphor emerged, to be followed by the organization-as-network metaphor current today (Contractor, 2002). The shift from earlier metaphors to computers and networks is undoubtedly related to advances in information and communication technologies (ICTs).

Today, there is an array of organizational forms, among them the knowledge-based, alternately known as the knowledge-intensive or virtual, organization. *Knowledge-based organizations* are characterized by the importance of information seeking and utilization, as well as knowledge creation, team and project work, collaboration and competition, and the use of information and communication technologies. There are also *distributed organizations*,

uniting geographically distant members or parts of the organization by means of ICT. It is evident that such organizations need tools for communication and collaboration at a distance (see e.g., DeSanctis & Fulk, 1999). Recently, networks have received much attention as novel forms of organizing for work (e.g., Monge & Contractor, 2003), undoubtedly to some extent concomitant with the rise of knowledge as the crucial asset of an organization and the advent of the Internet. Knowledge work comprises seeking existing information, creating and sharing ideas, and knowledge of products and services. Knowledge work often takes place in networks, knowledge networks, which can be seen as networks of knowledge-generating relationships between persons linked by face-to-face and electronic forms of communication. Such networks are based on human interaction and have a constant need for up-to-date information and innovative ideas.

This paper examines the role of mobility, mobile tools and human interaction in the context of organizations, especially knowledge-based organizations. The paper opens with a review of mobile work practices, to be followed by an analysis of mobile tools and their social context. The paper concludes with challenges for development and research.

## MOBILITY AND MOBILE WORK

Mobility refers to several phenomena. People can be mobile, for instance when commuting to work and when traveling on business. Tools can be mobile; common examples are mobile phones and portable computers. Communication and work can be mobile, when people interact and collaborate at a distance through ICT.

The nature of work and the workplace is changing. Work practices are being diversified (Kakihara, 2003), as workers are increasingly mobile and ICT enabled. Telework, or distance work, and flexwork, which is a combination of office work and out-of-office work, are commonly practiced. Two variants can be distinguished in telework and flexwork. The first variant is *wired* telework and flexwork, where landline telephones and wired computers are used as tools for working and communicating. In the second variant, *wireless* telework and flexwork, mobile devices such as mobile phones and laptop computers wirelessly connected to the Internet are used. By means of such mobile devices it is possible to collaborate with fellow employees outside the office. For instance, members of a team can collaborate even though they are geographically distributed; they can also be away from the "home base," visiting clients or traveling, and still be in contact with the other team members. Telework and flexwork with mobile tools can be called *mobile work*.

Mobile work involves operating at multiple locations and traveling between them—in moving vehicles, in waiting areas, and in hotel rooms. Mobile work is made possible by communication technologies, from landline phones to current and emerging information and communication systems, such as mobile phones, and wireless and wired computers (Brodie, 2003).

The emerging work practices of mobile workers have received some attention during the last few years. Churchill and Munro (2001) sum up that there are workers who themselves are mobile (moving between fixed offices equipped with stable ICT) and there are workers who carry wireless mobile technologies to be able to work in various unpredictable locations, where resources (e.g., connection to the Internet) may or may not be available. They point out that in mobile work the entire environment where work takes place contributes to the use of mobile technologies. In other words, the interface to mobile technologies includes the

environment. Therefore, the health and safety of mobile workers is an important issue. For instance, hotel rooms frequently have poor ergonomy for work.

Mobile work can be analyzed from several aspects. Kakihara and his colleagues (Kakihara, 2003; Kakihara, Sørensen & Wiberg, 2002) conducted a study of 60 mobile professionals in Tokyo. Among these, they chose three examples to illustrate the consequences of mobile technology in work: an independent town planning consultant, a freelance computer graphics designer, and a software entrepreneur. According to the researchers, emerging mobile professional work can be analyzed from three interrelated aspects of mobility, represented to a varying degree in the professionals investigated. The three aspects are locational mobility, concerned with the workers' extensive geographical movement; operational mobility, in relation to their capability for flexible operation as an independent unit of business; and interactional mobility, associated with their intense and fluid interaction with a wide range of people.

Thus, people can be mobile; people can work or operate from anywhere; people can interact with others who also are mobile and working from anywhere via mobile tools. When interacting with each other, people constantly need to negotiate whether the interaction is desirable or disruptive. From the perspective of many workers, the flexibility of mobile communication is definitely an advantage (Kakihara & Sørensen, 2002). For instance, a plumber can take new work orders while visiting a client. On the other hand, mobile communication can also be a nuisance. If the plumber´s phone continually keeps ringing, he or she can't get any work done. Thus, the plumber has to make a choice regarding the priority, or must find a balance between accessibility and undisturbed work.

In many lines of work, the possibility of arranging appointments through mobile devices and accessing the company database from a distance helps in organizing and coordinating work practices (O'Hara, Perry, Sellen & Brown, 2001). Mobile devices make it possible to negotiate with clients and fellow employees while away from the office. In fact, often an office is not needed at all. However, it appears that mobile communication is infrequently included in the information system of an organization, even though access from mobile devices to organizational databases would be highly useful (Brodie & Perry, 2001).

How do employees cope with their work in environment where both wired and wireless ICT is used? A study of workplace communication by Valtonen (2004), based on interviews with employees working in a large Finnish machinery company with worldwide clientele, highlights two areas where changes have taken place. First, the pace of interaction with clients has increased, and second, work and spare time have fused together. Such changes can lead to higher productivity, but how do the employees feel about them? According to the interviews, the fusion of work and spare time is not regarded as a problem; the interviewees are used to it. What they especially value is the possibility of having connections with their spouse and children while at work. However, as knowledge workers can operate at an intense pace for a great many hours a day, indeed, fatigue and stress may result (Anttila 2005).

## MOBILE TECHNOLOGY

Alongside with changes in organizations and work practices, a new kind of information environment is emerging. With mobile devices, be they phones or computers, people can reach each other as well as sources of stored information, such as company documents and

databases, electronic libraries, and encyclopedia. Lyytinen and Yoo (2002) refer to such an environment as a *nomadic information environment*. According to them, the main drivers for this environment are mobility, digital convergence and mass scale (meaning that digital gadgets are available for a large number of people on a global level).

Mobile phones have been used in organizations for some time already. They have become everyday communication devices in industrialized countries and they show great promise for building the communication infrastructure in developing countries. Mobile phones are extensively used both in the workplace and in the family, during travels and at home, for business and for fun. Mobile telephony is clearly a global success. It is not only a gadget or technology but also a social and cultural phenomenon. The mobile phone can be used for many purposes. Ling and Yttri (2002) distinguish three main uses: for safety or security in emergencies, for microcoordination in the logistics of everyday life and work, and for hypercoordination, using the mobile phone as a tool for self-presentation, personal expression and social interaction.

Mobile phones are a facet of information and communication technology, the technology developed for information processing. ICT has its roots in stand-alone computers, the "number-crunchers." With the advent of electronic networking, computers have gained the capacity to communicate with each other and, through them, people can communicate with each other. Thus, computers have developed into communication tools, permitting such activities as e-mail, instant messaging, videoconferencing and Internet telephony.

Mobile phones have conceptually (though not technologically) evolved from landline telephones, the traditional way for interpersonal technologically mediated communication at a distance. Currently, mobile phones are in the process of developing into handheld computers (known as "smart phones"), permitting activities such as word processing, e-mail and browsing. Computers are increasingly mobile, too. Mobile, also known as portable and laptop, computers are getting ever more popular, often at the expense of desktop computers. With wired or wireless connections they can be used both for communication, via e-mail, chat and so on, and for accessing stored information. Clearly, computers and mobile phones are technologically converging.

One of the fears often expressed in connection with ICT is that there will be less face-to-face communication, fewer social contacts, in the future. Such fears have been manifested both in everyday life and working life. Computers and the Internet, as well as mobile phones and text messaging, often have been blamed for the experienced degeneration of close contacts (e.g., Sleek, 1998) and work relationships.

It is certainly possible that there may be adverse effects. In Japan, there are quite a few cases of *hikikomori*: young (usually) men socially isolating themselves from the world often by locking themselves in their rooms and immersing in the Net or computer games or both (Watts, 2002). Disturbing as this may be, to regard ICT as the cause for such behavior is unfounded. There are contributing factors other than ICT for this kind of behavior, such as general unwillingness or inability to fulfill expected social roles. The Japanese educational system as well as the society at large are extremely competitive, imposing strong demands on individuals and families. In spite of all these pressures, by far the great majority of Japanese adolescents and young adults live perfectly normal lives, with ICT playing a part—and only a part—in their lives.

Actually, both in everyday life and in work organizations there is ample evidence of mobile phones and ICT reinforcing social contacts and networks (e.g., Johnsen, 2003; Katz &

Rice, 2002; Licoppe, 2003; Ling & Yttri, 2002; Taylor & Harper, 2002). Research on technologically mediated communication appears to show that people use whatever means they have at hand to communicate—if they want to communicate (Chenault, 1998; Walther & Burgoon, 1992). As Valo (2003, ¶ 1) puts it in her study of Finnish and American students collaborating in the web:

> However, technological systems per se determined neither the type of personal relationship created nor its characteristics. In the students' experience, their relationships and interactions with their transatlantic partners were not "virtual" or "cyber-space" but a slice, though captivating, in their everyday communicative life.

In the working life, the medium used does not determine the characteristics of communicative behavior. Instead, people use the available media in ways that suit their intentions and their preferences. Technology-based theories such as media richness (Daft & Lengel, 1984; see also Buchel, 2000) claim that people make rational choices matching a particular communication medium to a specific task and to the degree of richness required by that task. However, the media richness theory can be criticized for failing to take into account the social context in which media choice decisions are made in organizations. There is need for a much broader social and political framework to complement the media richness theory. Mobile phones and ICT are not simply technological devices but social and cultural phenomena as well; people and technology have a reciprocal relationship. Users shape the technology they use to fulfill their needs, and communication can be rich even when the medium is not.

The consequences of the mobile phone for organizations have been examined by Geser (2004, pp. 25–31; The word *consequences* that he uses may not be the best word here, as there hardly exists a causal relationship). He presents, among others, the following trends, connected to mobile phones:

- Organizational communication is decentralized. Members of the organization can use informal channels for communicating irrespective of organizational hierarchy or boundaries (which is sometimes referred to as back channel communication).
- The importance of cultural traditions and internalized norms is reduced, and the impact of particular current conditions (determined by the interaction between organization members) is heightened. Collectives may be weakened; networks may be strengthened.
- Interaction between clients or citizens and organizations is intensified. For instance, emergency services can be alerted by passers-by.
- A shift from rigid bureaucratic organizations to "adhocracies" is facilitated, where timetables and cooperation patterns are constantly reshaped.

Even though Geser specifically examines the relationship of the mobile phone and societal phenomena, his ideas are probably valid as well for other mobile communication tools, such as wireless computers. Geser (2004, p. 40) comes to a radical conclusion: "It can well be

argued that cell phones have a certain 'subversive' capacity to shift the weights from dominant to less powerful individuals and from formal institutions to informal social systems."

Thus, there may be emancipatory potential in the use of mobile tools in organizations. However, the issue is not that simple. When looking in general at ICT use in organizations, there are contradictory studies, some claiming that ICT may lead to empowerment and flexibility and others that it may lead to oppression and rigidity (Robey & Boudreau, 1999; see also Buchel, 2000). ICT appears to have a dual function. It can be an enabler, but the outcomes depend on how it is implemented in an organization (Pinsonneault and Rivard, 1998). It is important to realize that ICT, whether mobile or stationary, cannot be separated from an organization's social context: line of business, mission, management, structure, and culture.

## CHALLENGES FOR RESEARCH ON MOBILE COMMUNICATION

Discussions about organizational communication and work often start from a simplified notion of the office. Few employees are confined to their cubicles, to be stationary for the entire duration of the working day. Employees go to meetings, visit clients, chat with colleagues, have lunch, and so on. Employees differ much in how stationary or mobile their work practices are. In an organization, there probably is a continuum from stationary to mobile work. Besides, many workplaces are not offices, but factories, shops—or even geographically distributed knowledge-based organizations.

Consequently, the communication and work practices of employees in different organizations, in various professions, and in various lines of work should be investigated. Questions include: How do different groups of workers and employees use mobile devices for communication (e.g., knowledge workers versus those working in agriculture and forestry)? How are interaction patterns and social relationships formed in organizations where work is mobile and flexible and where mobile devices are used, as compared to more traditional organizations? How can employees be assisted in functioning efficiently in a nomadic information environment? These are but a few questions that future research needs to answer.

A nomadic information environment, where ambient information and communication technology is abundant, presents challenges to the development of information systems. Krogstie and his colleagues (2004) emphasize that information systems need to be designed for mobile use, too. Mobile wireless computers are not particularly problematic (though low connection speed may sometimes be a nuisance). A bigger question is to what extent information systems need to be customized for mobile phones.

The organization-as-computer metaphor of organization can be associated with the idea of organizational memory, an information system where information related to work tasks is stored. Access to the system is necessary for efficient work. Naturally, information needs to be explicit in nature, as it is codified into the information system. When organizations are viewed through the organization-as-network metaphor, both face-to-face and ICT-enabled interaction and collaboration are highlighted. Even though information systems continue to be important for efficient work, the creation of knowledge and innovations requires that implicit and tacit information (Polanyi, 1966) be put to use through human interaction. The relationship of these two approaches is crucially relevant for knowledge-based organizations; further studies are needed.

Research on mobile communication, mobile tools and work is carried out from the perspective of many areas of research. Recently, Kakihara (2003) has suggested a new area of research, *mobile studies*, to address the challenges. According to him, the roots of this area of research are in computer-supported cooperative work, mobile informatics, and information systems. However, such a narrow view is not at all sufficient. Alongside with such mainly technological aspects, research is needed in the social and cultural aspects of ICT-enabled mobility, with an emphasis on human interaction and the sharing and creation of knowledge.

## REFERENCES

Anttila, T. (2005). *Reduced working hours: Reshaping the duration, timing and tempo of work.* Doctoral dissertation, University of Jyväskylä, Finland.

Brodie, J. (2003, April). Designing to support communication on the move. *Proceedings of the Conference on Human Factors in Computing Systems (CHI 2003),* Ft. Lauderdale, Florida, USA. Retrieved February 14, 2005, from http://www.brunel.ac.uk/~cssrmjp/dismob/CHIBrodie.pdf

Brodie, J., & Perry, M. (2001). Designing for mobility, collaboration and information use by blue-collar workers. *ACM SigGroup Bulletin*, *22*(3), 22-27. Retrieved February 14, 2005, from http://www.brunel.ac.uk/~cssrmjp/homefiles/selected-publications/downloads.html

Buchel, B. (2000). *Communication Technology Enabled Knowledge Organizations.* Gordonsville, VA: Palgrave Macmillan.

Chenault, B. G. (1998, May). Developing personal and emotional relationships via computer-mediated communication. *Computer-Mediated Communication Magazine.* Retrieved February 14, 2005, from http://www.december.com/cmc/mag/1998/may/chenault.html

Churchill, E. & Munro, A. (2001). Work/place: Mobile technologies and arenas of activity. *SIGGROUP Bulletin*, *22*(3), 3–9.

Contractor, N. (2002). Introduction to part three: New media and organizing. In L. Lievrow & S. Livingstone (Eds.), *The Handbook of New Media*, (pp. 201-205). London: Sage.

Daft, R., & Lengel, R. (1984). Information richness: A new approach to managerial behavior and organizational design. In L. Cummings & B. Staw (Eds.), *Research in organizational behavior, Volume* 6 (pp. 191-233). Homewood, IL: JAI Press.

DeSanctis, G., & Fulk, J. (Eds.). (1999). *Shaping organization form: Communication, connection, and community.* London: Sage.

Geser, H. (2004). *Towards a sociological theory of the mobile phone.* University of Zurich. Retrieved February 14, 2005, from http://socio.ch/mobile/t_geser1.htm

Johnsen, T. E. (2003). The social context of the mobile phone use of Norwegian teens. In J. Katz (Ed.), *Machines that become us: The social context of communication technology,* (pp. 161–170). New Brunswick, NJ: Transaction Publishers.

Kakihara, M. (2003). *Emerging Work Practices of ICT-Enabled Mobile Professionals.* Unpublished doctoral dissertation, London School of Economics and Political Science, University of London. Retrieved February 14, 2005, from www.kakihara.org

Kakihara, M., & Sørensen, C. (2002, August). "Post-modern" professionals' work and mobile technology. In *Proceedings of the 25th Information Systems Research Seminar in Scandinavia*, Bautahøj, Denmark. Retrieved February 14, 2005, from http://mobility.is.lse.ac.uk/html/downloads.htm

Kakihara, M., Sørensen, C., & Wiberg, M. (2002, May). Fluid interaction in mobile work practices. First Global Mobile Roundtable, Tokyo, Japan. Retrieved February 14, 2005, from http://mobility.is.lse.ac.uk/download/KakiharaSorensenWiberg2002.pdf

Katz, J., & Rice, R. (2002). Project Syntopia: Social consequences of Internet use. *IT&Society*, *1*(1), 166-179.

Krogstie, J., Lyytinen, K., Opdahl, A., Pernici, B., Siau, K ., & Smolander, K. (2004). Research areas and challenges for mobile information systems. *International Journal of Mobile Communications 2*(3), 220–234.

Licoppe, C. (2003). Two modes of maintaining interpersonal relations through telephone: From the domestic to the mobile phone. In J. Katz (Ed.), *Machines that become us: The social context of communication technology,* (pp. 171–186). New Brunswick, NJ: Transaction Publishers.

Ling, R., & Yttri, B. (2002). Hyper coordination via mobile phones in Norway. In J. Katz & M. Aakhus (Eds.), *Perpetual contact: Mobile communication, private talk, public performance,* (pp. 139–169). Cambridge, UK: Cambridge University Press.

Lyytinen, K., & Yoo, Y. (2002). Research commentary: The next wave of nomadic computing. *Information Systems Research, 13,* 377–388.

Monge, P. & Contractor, N. (2003). *Theories of communication networks*. Oxford, UK: Oxford University Press.

Morgan, G. (1986). *Images of organization*. Beverly Hills, CA: Sage.

O'Hara, K., Perry, M., Sellen, A., & Brown, B. (2001). Exploring the relationship between mobile phone and document activity during business travel. In B. Brown, N. Green, & R. Harper (Eds.), *Wireless world: Social and interactional aspects of the mobile age,* (pp. 180–194). New York: Springer.

Pinsonneault, A., & Rivard, S. (1998, September). Information technology and the nature of managerial work: From the productivity paradox to the Icarus paradox? *MIS Quarterly*, 287–310.

Polanyi, M. (1966). *The tacit dimension*. Garden City, NY: Doubleday.

Robey, D., & Boudreau, M. (1999). Accounting for the contradictory organizational consequences of information technology: Theoretical directions and methodological implications. *Information Systems Research, 10,* 167–185.

Sleek, S. (1998). Isolation increases with Internet use. *American Psychological Association Monitor 29*(9). Retrieved February 14, 2005, from http://www.apa.org/monitor/sep98/isolat.html

Taylor, A., & Harper, R. (2002, April). Age-old practices in the "new world": A study of gift-giving between teenage mobile phone users. In *Proceedings of the Conference on Human Factors in Computing Systems (CHI 2002)*, Minneapolis, Minnesota, USA. Retrieved February 14, 2005, from http://www.surrey.ac.uk/dwrc/Publications/GiftGiving.pdf

Valo, M. (2003). Workmates, friends – or more? Perceived effects of computer-mediatedness on interpersonal relationships. *Electronic Journal of Communication, 13*(1). Retrieved February 14, 2005, from http://www.cios.org/getfile/valo_v13n1

Valtonen, P. (2004). *Työyhteisön kokemuksia viestintäteknologian ja mobiiliviestinnän käyttöönotosta ja käytöstä* [Experiences of a work community in the adoption and use of ICT and mobile communication]. Unpublished master´s thesis, University of Jyväskylä, Finland.

Walther, J. B., & Burgoon, J. K. (1992). Relational communication in computer-mediated interaction. *Human Communication Research, 19,* 50–88.

Watts, J. (2002). Public health experts concerned about "hikikomori." *The Lancet, 259,* 1131.

---

All correspondence should be addressed to:
Pertti Hurme
University of Jyväskylä
Department of Communication
P.O. Box 35
FI-40014 University of Jyväskylä, FINLAND
pertti.hurme@jyu.fi

---