The Home Office – a new architectural perspective

By Stefan Junestrand & Inés Leal

Stefan Junestrand & Inés Leal are both partners in Leal & Junestrand Architects. The office is specialized in projects where the clients use new IT-solutions to improve their processes. The architecture is then used as a tool to support those changes.

Stefan Junestrand is also a researcher at the Dept. of Architectural Form and Technology and at Center for User Oriented IT-design at the Royal Institute of Technology, Stockholm, Sweden.

Abstract

The paper gives initially a description of how we now are experiencing a move from an industrial society to an information society and how telework, supported by information technology, relate to this. This is followed by a discussion of the architectural design of the dwelling and how it has to change to support these new work processes.

The sciences of the artificial, which is basing the science in the participation in the design of artifacts, is the theoretical framework of the paper. The general research question is: How should the future home office be designed and integrated into the dwelling in the context of a more complex process of living both in time and space?

Two projects are presented. One is a full-scale telework laboratory at the TCO Development Unit. The other is the design of a new home office. A discussion including possible guidelines for the design of the home office finishes the paper.

Keywords: architecture, dwell, dwelling, future, home office, laboratory, sciences of the artificial, telework.

The information society

In the 18th century started, in Europe, a social, political and economical change from an agricultural society to a fully developed industrial society characterized by materialistic development, science, education and democratic organization. Now, in the end of the 20th century a major part of the world is in the beginning of a new period, the *information society*. And the information technology is a prerequisite for this change from a society focused on industrial production to a society dominated by handling of information and based on communication. (Dahlbom, 1997)

The information technologies will direct or indirect, free us from a large part of the mechanical work. And work will consist of more and more talking and interacting with other people (Dahlbom, 1997). This and other new ways of working will be possible from almost anywhere and to an even larger extent be supported by IT-solutions.

Telework

Telework from the home, supported by new information technologies, is one way of working that might increase in the near future. But the possible increasing of telework from our homes just don't happen, it has a larger economical, social, political and technical backbone such as:

- Changing organizational and economical structure within companies and organizations (Forsebäck, 1995).
- New social trends and values in a diversified individual perspective where the limits between the private, e.g. the family life, and the public, e.g. work, are loosening up (Dahlbom, 1997).

- New attitudes towards telework from a political view, both national and international (i.e. Bangemann, 1994).
- New information technologies that free the worker in time and space. (Junestrand & Tollmar, 1998)

The dwelling

The dwelling is meant primarily to support the activity "to live". And we are now experiencing a major change in our way of living and working in the transition from an industrial society to an information society. So when the way of living is changing, the design of the dwelling also has to change. The dwelling of the information society has to be designed in a radically new way, among other things, supporting (Junestrand & Tollmar, 1998):

- the performance of professional work and other new, or changing, activities supported by IT,
- the interaction between a more complex set of activities in time and space,
- both the private life and public life in mediaspace and the borders in between them,
- installations of new information technologies.

The reasons and ideas

The knowledge about both telework and the use of technology in our homes is today very low. And there is a lot of work and efforts of investigation in front of us all involved in the development of home based telework to increase that knowledge.

The idea is that the architectural design of the home office has to take its standpoint in the integration in time and space of work and everyday activities, as well as in the development of new information technologies.

And a dwelling with a well-designed home office can, with the reasoning above, become a more ergonomically, functional and strategic tool for the individual's maintenance in tomorrows society.

Design theory and methods

The theoretical framework of the projects presented in this essay is based on the ideas of the *sciences of the artificial*, introduced by Herbert Simon. (Simon, 1969) And then mainly as they are developed by Bo Dahlbom. He writes (Dahlbom, 1997) "When we realize that the world we live in is an artificial world, a world of human creation, made up by artifacts of all kinds, becoming even more complex and intertwined, our attention will shift from studying nature to contributing to the design of artifacts." In future science the designer becomes a part of the design. There he investigates what is possible in the design and thereafter he structures, analyses and spread that information. (Dahlbom, 1998) That is what has been done in the described projects and is presented in this essay.

Research questions

Some general research questions for the work related to the architectural design of the home office has been:

- How should the home office be designed to support new work processes and an increasing use of information technology?
- How should the future home office be integrated into the dwelling in the context of a more complex process of living, both in time and space?
- How can the architectural design of the home office support the borders between the private physical space and the global digital world within the borders of the home?

The result of the work will not, even in the long run, point out specific answers to each one of these questions. The result will rather be an ordering and discussion of relevant factors, concepts and possible solutions.

Figure 1. The Telework laboratory at TCO - the Swedish Confederation of Professional Employees. The picture is taken from one of the equal spaces for home office settings. In the front the drop-leaf table. In the background the IT-panel.

The Telework Laboratory

The Swedish Confederation of Professional Employees (TCO) unites 1.3 million Swedish white-collar workers. And as a result of their long interest in telework the TCO Development Unit initiated a Telework Laboratory in the spring of 1997. The group of directory is multi-disciplinary and consists of selected competencies such as *architecture* and *IT* (Inés Leal and Stefan Junestrand); *ergonomics* (Tone Petrelius); *visual quality* (Bo Persson); *business development* (Per-Erik Boivie) and *psychology* (Karl Åborg).

The primary aims of the lab are to:

- offer a dynamic environment for investigation and development of the physical environment for telework,
- demonstrate and evaluate products for telework,
- spread information about telework,
- collaborate with employees, employers and other researchers,

- initiate contacts and collaboration with producers of products and services for telework.

The architectural design started with a program developed in the multi-disciplinary work-group. Some general design criteria where specified for the laboratory:

- Several functions where to fit within the lab; two spaces for telework; one flexible workstation; one laptop workstation; one table for short meetings; interactive means for presentations; and storage.
- The technology was to be built into the physical room and interior designs.
- A maximum of spatial flexibility was to bee seaken.
- A visually neutral space was to be created.

The laboratory was buildt in fall of 1997 in an old conference room and Leal & Junestrand Architects did the architectural design. The result is a dynamic architectural environment providing a variety of activities of different

character. Two equal spaces for telework, with a window in a sloping roof, are arranged along one long side of the lab. On the opposite side a flexible workstation table for sitting down or standing up and a laptop workstation are integrated into an IT-panel. The IT-panel also contains interactive means for presentations such as a white-board and a bulletinboard. In the middle of the room a meeting table is integrated into the central wall. This table is designed as a drop-leaf table which makes it occupying very little space when closed but offering a good space for the reunions taking place within the laboratory when its open.
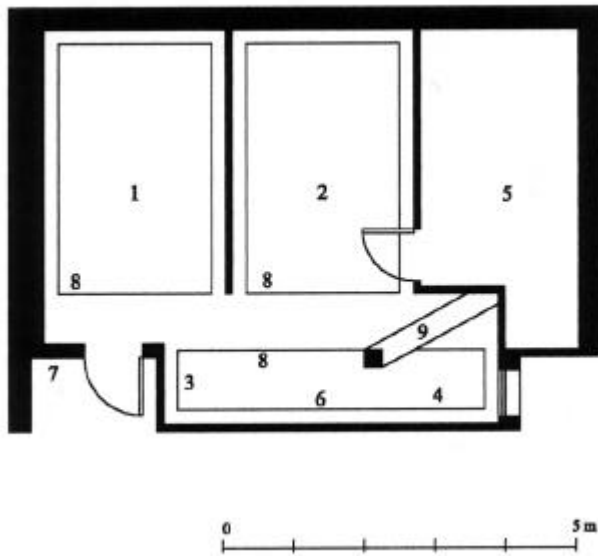

Figure 2. Plan of the Telework Laboratory. 1-2. Equal spaces for home office settings. 3. Flexible table. 4. Laptop workplace. 5. Storage. 6. IT-panel with interactive means for presentations 7. Entrance. 8. Replaceable floor materials. 9. Bench for thinking and relaxing.

The spatial flexibility is achieved by making the central interior wall and the table for the reunions easily removable. Cables and outlets for electricity, tele and data are, as much as possible, integrated into the walls, ceilings and fixed interior designs. The floors consist of a fixed framework with rectangular wholes where floors of different type (material, color etc.) can be placed. Walls and ceilings are white and fixed interior designs are mainly in birch i.e. that the visual character of the space is neutral. This provides the possibility to "pull" the design into different directions depending on which investigation or demonstration is going on. (The design of the

laboratory is continuously improved during the project.

The main theme for the experiments during the end of 1998 and the spring of 1999 is *Architectural qualities in the home office*. Two different home office settings will be built up. One is a *traditional self-made home office* and the other is *an industrially designed home office*. This "pedagogical study" aims at two things. The first is to point out differences in the architectural design and the perception of these two settings. The second is to try to find concepts for the qualities in the architectural design in each one of these settings, by user participation. The concepts and their meaning can later work as guidelines for further development of furniture and other home office related products.

Figure 3. The two equal spaces for home office settings. In between, integrated into the removable wall, the drop-leaf table for short reunions is placed.
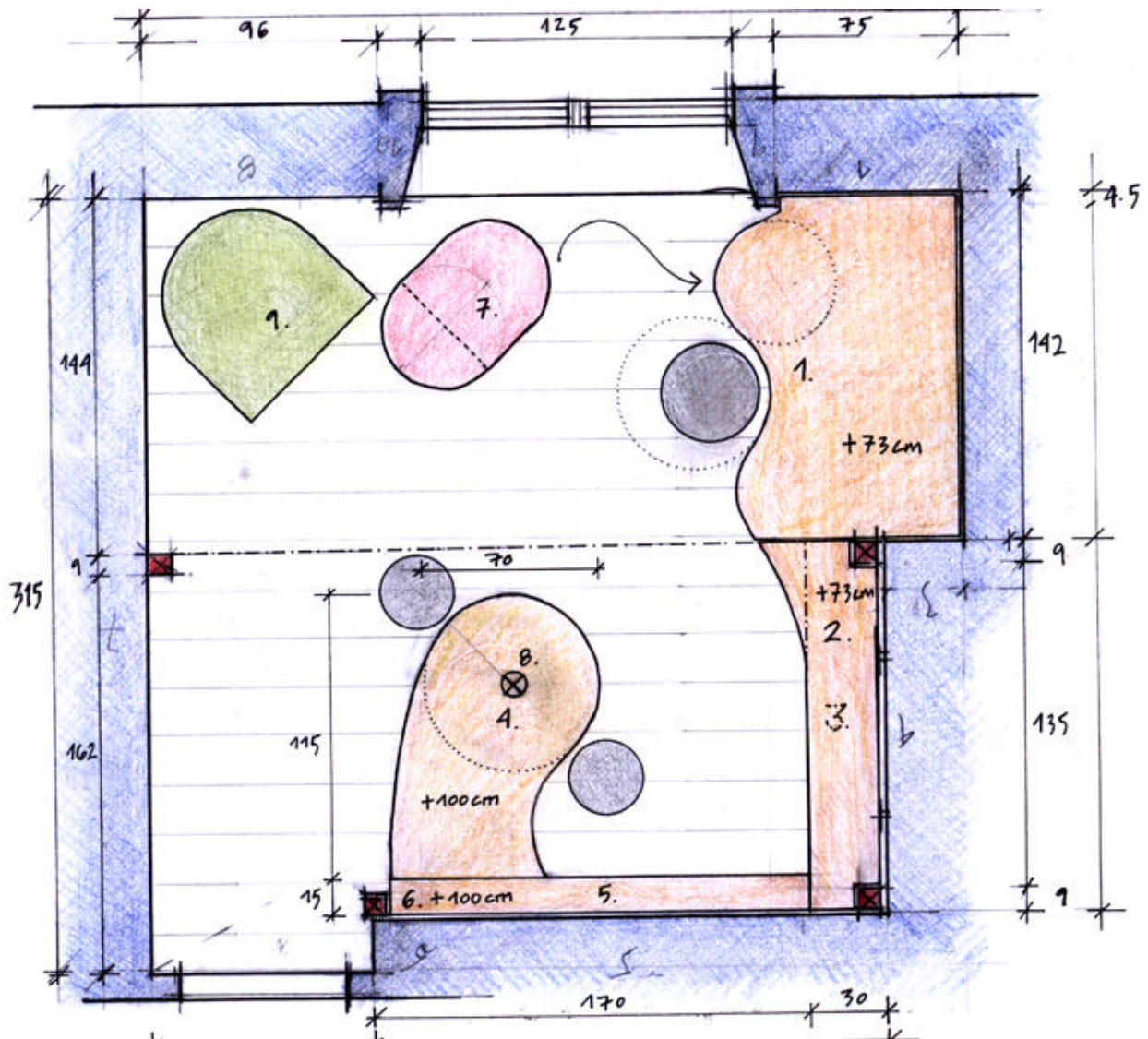
Figure 4. Plan of the Home Office of Per-Erik Boivie. 1. Place for writing and other computer supported work. 2. Place for printer etc. 3. Storage for books and files. 4. Place for cooperative work and short meetings. 5. Storage. 6. Folding function of the table. 7. Small rolling pedestal with a plexiglas top. 9. Old comfortable chair for reading.

A Home Office for telework

In the end of 1997 Per-Erik Boivie - the founder of the TCO certification of computers - changed position within TCO. At that moment he renegotiated his terms of employment and it was agreed upon that he should have the possibility to work from home a couple of days per week. A home office was also to be built. The design was done as the first case study within the activities of the TCO telework laboratory.

Per-Erik lives with his wife and dog in an apartment in the old town of Stockholm. Close to entrance door of the flat, a room had become free after his son had moved out. This room had been used for sporadic work at nights and weekends but was now to be turned into a professional home office. The room has one window towards a backyard. The size of the room is about 3,30 by 2,90 meters wide and the height is about 3 meters. An existing loft working as an extra bed for temporary guests was to be kept, as well as an old favorite chair for reading. The project was also to be done as a *learning process* i.e. that everything was not going to be changed at one moment but over a longer period of time.

The design proposal contained the following:

- A place for writing and other computer supported work at a flexible motor-driven table that permit working both standing up and sitting down.

- A place for cooperative work and short meetings, at a table for standing up or sitting at a high chair.

Figure 5. The computer workplace in the home office of Per-Erik Boivie. The rounded forms of the table permits a position close to the table and good support for the arms. The colors are neutral and make no disturbing contrast.

- The use of an existing old comfortable chair for reading.
- Storage for books and files at shelves.
- A small rolling pedestal for suspended pockets covered with a plexiglas top.
- A new chair.
- A soft and light peach color for the walls and maple-wood for the tabletops.
- A rolling pedestal for storage of paper before recycling.
- Wire-less telephone for flexible uses of the apartments all spaces.

Leal & Junestrand Architects in close collaboration with Boivie, Persson and Petrelius carried out the architectural design.

Per-Erik has frequently used the new home office. His specially designed office forms the spatial center of the work related activities he carries out in his home, although many other rooms are used in some way or another, i.e. the dinner-room for reunions and the sofa for reading. The home office of Per-Erik is continuously improved in different ways and the project is an important reference for the TCO telework laboratory.

Figure 6. A rolling pedestal for storage of paper before recycling.

New ideas about the home office - guidelines

Some reflections can be pointed out from the discussions in this essay. These take the standpoint primary in the architecture as a tool for organization of work and daily life in time and space.

- Different places in the home better support different kinds of work related activities depending on their spatial design and location.

- All of the home should bee studied as a potential place for telework related activities and not only the limited home office area.

- Telework in the dwelling has to be seen as a process that has to be coordinated with other home-related activities in both time and space.

- Traditional design qualities of the home have to be combined (and not replaced) with specific design qualities of the more public home-office.

- IT solutions should permit flexibility in the spatial use of the dwelling.

- Movement during work is ergonomically and mentally healthy.

- The security issue should not always bee seaked through lockable furniture or rooms but rather by software solutions.

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Address:
Leal & Junestrand Architects
C / Lope de Rueda 11, 2 dcha.
28009 MADRID
Spain

tel: +34-629 25 29 80

internet: www.ljar.com
e-mail: info@ljar.com