

Visiting eWorkers' Homes - Three Stories for Designing eWork Homes and Furniture

Katja VIRTANEN¹, Tuuli MATTELMÄKI¹, Sirkka HEINONEN²

1 University of Art and Design Helsinki, Hämeentie 135C, Helsinki, 00560, Finland

Tel: +358 9 75631, Fax: +358 9 75630345, Email: firstname.lastname@uiah.fi

2 VTT Building and Transport, P.O.Box 1800, VTT, 02044, Finland

Tel: +358 9 4566288, Fax: +358 9 464 174, Email: sirkka.heinonen@vtt.fi

Abstract: This paper describes the results of the case study 'eWork at Home'. The case focused on understanding the needs of eWorkers. Among the aims was to define requirements for the user-centred design of future eWork environments in a home-office or an apartment. The requirements are described in three real stories of eWork at home that illustrate the current reality of eWork and attempts to balance work and home life. The understanding of subjective perspective can broaden the design requirements from simple visual or functional aspects by taking into account activities in social contexts, personal values and attitudes.

1. Introduction

eWork at home goes beyond the actual work tasks. The home is a private space where people relax, engage in personal interests, spend time with and take care of the loved ones. Increasingly, the home is also a place for working. Working at home carries various meanings. One person considers eWork at home as a regular paid job; another might think it as working overtime, studying or taking care of business.

To offer sustainable solutions that help maintaining a work-life balance in this contradictory context, designers and other stakeholders need to learn about the needs and requirements of the real eWorkers. User-centred design offer tools for understanding eWorkers' needs holistically and also for learning about their subjective experiences. This is necessary because of the importance of understanding what, and especially how, needs and requirements are fulfilled. Thus, a combination of background research, expert interviews, quantitative marketing research and qualitative user study approaches provide a large scale of both objective information and subjective insights for design.

1.1. User-Centred Design

User-centred design aims at creating a dialogue between the designers/developers and the users starting from the beginning of the development activities continuing throughout the design project [1]. This dialogue allows iterative design of solutions.

User-centred design and participatory design have a long and strong tradition in Scandinavian design community [2]. Participatory design involves the end user as an active design member in the development of products, environments and services [3]. Recently, the attention has shifted from improving usability and ergonomic problems into wider perspectives such as experience in everyday life [4]. Tools, that are more focused on the subjective experiences, motivations and attitudes, have been introduced to be applied in design for user experience [e.g. 5,6,7].

One of the roles of user studies that precede design phases is to probe for design opportunities [8]. The goals include getting designers to learn to understand the people they

are designing for, their experiences, motivations and actions and the context of these actions. Furthermore, the user study results provide tools for a team of researchers, designers and other stakeholders to create a common understanding of the users and to use that understanding for creating more sustainable and pleasurable solutions.

1.2. Case 'eWork at Home'

The case study 'eWork at Home' was conducted at the University of Art and Design Helsinki from July 2002 to June 2003. The case was a part of the three year research project Luotain – Design for user experience [9]. The case gathered people from the furniture, real estate and design consultancy businesses from Finland and it was supported by well-established eWork research.

The objective was to draw a broad picture of eWorkers at home. The main focus was on eWork spaces within the home building, furniture and tools as well as on the best practices in the eWork field. The aim was to support user-centred concept design in the three participating small and medium sized enterprises (SMEs).

The results of the case study were rich. The final results included various visual descriptions of eWork activities, central themes, opportunities and challenges at home. Moreover, the collaborative process and the results provided a learning experience for the company participants.

2. Objectives

Usually eWork at home is treated from an organisational or management perspective [10]. In this paper eWork is understood as work in the midst of individual living. This refers to the idea that eWork is situated at home where primarily leisure activities happen. Work is an extra activity at home. The availability of information technology and broadband telecommunication networks is increasing the interest towards eWork and, thus, offering opportunity for increased flexibility in everyday work and life [11]. Since requirements for work and home life may have remarkably different factors, home as a workplace has special demands [12].

The objective of this paper is to illustrate the perspective of eWork and everyday life. The paper presents three stories of individual eWorkers. The stories summarise the research findings for designing the future eWork environments at home. The summaries include individual motivations, needs and habits; social issues; and aesthetics, functionality and ergonomic requirements for the environment.

3. Methodology and Process

The case study applied UCD methodology, group work tools and the latest eWork research. The process comprised of four phases that included participatory sessions with users, researchers and company representatives.

3.1. Collaborative Research and Design Phases

In the first phase [See Figure 1], a background study of eWork was conducted in order to outline the issues to be addressed in the case study. The survey covered eWork as a developing phenomenon and existing home-office solutions and practices. Contextual inquiry of an eWork expert exposed the complexity of the phenomenon, but supported the focus of the user study.

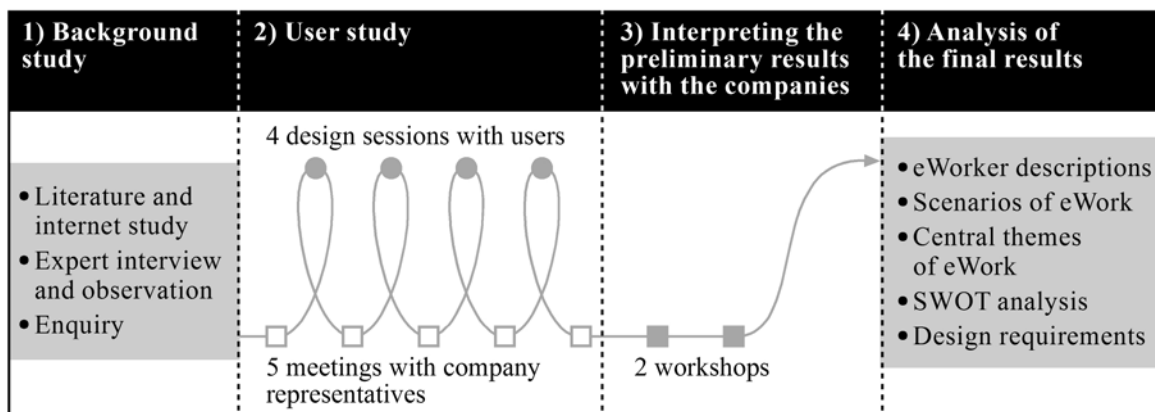


Figure 1: The four phases of the case study 'eWork at Home'.

The second phase, the user study, was the main research action in the case study. The user study aimed at understanding eWork at home with a broad interest in both concrete issues, such as ergonomics and electricity outlets, and more abstract issues including attitudes, activities and preferences. The focus was not on requirements set by the employer or rules and regulations, but on the experiences of individual eWorkers. The user study lasted for ten weeks and gathered data about long-term experiences of eWork. The qualitative user study focused on five households in two newly completed apartment buildings. The households were chosen to cover various factors such as working tasks, apartment and family size.

The user study had two parallel activities: design sessions with users and their ongoing self-documentation. The design session included household-specific interviews and participatory design sessions which aimed at developing the ideal home-office furniture for the eWorkers from the existing modular furniture. The design consisted of 1) design of the home-office furniture based on the individual requirements and 2) redesign of the home-office furniture based on the use experience. In these design sessions, the users, company specialists and researchers were present. The users' self-documentation focused the design sessions by creating a pre-understanding of experiences of eWork and using the home-office.

3.2. Towards Results by Co-Operating with the Companies

The co-operation with companies played an important role in the case study. Several meetings were organized with company representatives between the design sessions to share the progressive understanding of eWork by presenting the latest user data and for focusing the user study when needed [See Figure 1].

In the third phase, the user data was interpreted into design requirements and future visions in workshops with multidisciplinary teams of company representatives and researchers. The results were further elaborated and documented into descriptions and visual summaries by the researchers in the fourth phase.

In the following next three chapters three stories of eWork are presented to illustrate the results of the case study.

5. Story 2: Jan's and John's Multiple Interests

Jan and John are a young married couple. They appreciate small everyday things. They enjoy by going to sauna after training outdoors, cooking and eating well, or planning the details of next holiday trip. The home is the centre of life for them. They dream of a big single-family-house in a small town with all the possibilities for children, music, movies and maybe even billiards.

Home is not the primary work place for Jan and John. The motivation for eWork at home is in the external circumstances. Both of them are studying, Jan as an under-graduate and John pursuing a PhD. Presently, the only individually ergonomic environment for tasks that require peace and quiet is at home. Tasks related to reading, writing and preparation for seminars are done at home from two to five days a week, mostly in a separate study room. They underline that having a good relationship is a precondition to organising eWork flexibly.



Figure 3: Jan and John are interested in many activities at home. They have a room for handcraft activities, storing hobby-related items and work, too.

Jan and John had reserved a room for studying, but also for other various interests [See Figure 3]. In the room, they do computer work with a PC and laptop by taking turns or next to each other. The original requirements led to a quite traditional home-office furniture including a table with ergonomic screen-rack, shelves with pigeonholes for organizing frequently used items, cupboards for filing, and drawers for miscellaneous hobby-related items. The home-office furniture was set next to the electric and Internet sockets. Personalisation was made with light and youthful sanded glass doors. Also the scenery from the window and a place for potted plants were considered.

Later the multiplicity of the activities unfolded via self-documentation. For instance, Jan and John planned their next holiday trip to Mexico and sewed a wedding gown for a friend. Equipment for hobbies, such as sports clothes and running shoes or digital camera with all the accessories, was stored in the room.

The awareness of multiplicity of activities guided the redesign of the home-office furniture to create more space for different activities. Some items were rearranged to create more space on the table, and more pigeonholes and drawers were added.

6. Story 3: Peter's Mobile Life

Peter is in his forties and lives alone, even though he is happily married. He is an ex-patriot who lives where the work is. He changes regularly the job position and the place to live to keep the flow. For the last three years he was in Asia and now the plan is to stay in Finland for a couple of years. Peter's wife lives and works in Rome where their real carefully decorated home is.

The motivation of eWork is to ease life in practice. Peter's work as a manager includes many meetings that require mobility within capital area, inland and abroad. Often, meetings call for simple actions, such as writing memos, documents or e-mail. These tasks take approximately an hour, a couple of times a week or even daily, and are accomplished with a laptop. Peter wants to feel himself free to make his own decisions and eWork at home is a self-piloted way to help managing life in hectic business.



Figure 4: Peter lives in a small apartment. He is interested in light and stylish solutions that fit to his work-oriented and social ex-patriot lifestyle.

Peter's activities at home, such as sleeping, dining, watching television, socialising with friends and also working, are all located in one room [See Figure 4]. He has not reserved any specific location for work in the single-room-apartment. Since high aesthetic demands with a Scandinavian design style were set, simplicity with few and well-considered furniture were preferred when decorating the home. Peter had accepted only a bed, a sofa and a low bookcase in the apartment by the beginning of the case.

Since the current apartment is not a sustainable solution, a light, compact and easy to move home-office furniture solution was preferred. Peter's needs led to designing a home-office furniture including a table big enough for dining also, a few shelves for frequently used items, a place for a stereo set and a cupboard for storage. The home-office furniture was placed in a free space next to the kitchenette and the electric outlets. The Internet sockets are in the other side of the room. Personalisation was made with a stylish sanded glass door, and with the red-coloured table chosen to match the large wool rug.

In the redesign phase, some aesthetical improvements were made. Visual clarity and balance was created by adding pigeonholes in the shelves and an extra door of sanded glass.

7. Visions

The three stories presented three very different eWork narratives from individual perspectives. The following table summarises the essential elements which should be addressed when designing future homes and furniture for eWork [See Table 1]. The elements are drawn from the three stories including eWorkers' needs, values, motivations, attitudes and experiences. They cannot be generalised as such. However, they are guiding design briefs into a more human and design solutions into more socially sustainable direction.

Table 1: Summary of the essential elements from the three stories to be addressed when designing future eWork homes and furniture.

	Sam's Heavy eWork family	Jan's and John's Multiple Interests	Peter's Mobile Life
<i>Apartment</i>	4-room-apartment	3-room-apartment	1-room-apartment
<i>Residents</i>	2 adults and 2 adult children every 2nd week	2 adults	1 adult
<i>Personal values</i>	Well-being of the family, interests in many fields of work and leisure time	Family-centred, leisure time oriented with multiple interests	Work-oriented ex-patriot, self-piloted independence
<i>Personal motivation for eWork</i>	Work-life balance in family	External circumstances	Ease life in practice
<i>Personal attitude to activities in home-office</i>	Multiple work tasks	Varying tasks of multiple interests	Simple work tasks
<i>Other requirements</i>	Office-like furniture in home environment	Multi functional activity room	Aesthetic and light combination of work and dining

The eWorkers' homes and furniture need to fit into the high demand of combining personal lives and work into a sustainable, work-life balanced setting. In the case the participants' home-office furniture was combined from the existing modular solutions. Based on the findings of the study the ideal solutions could be quite different and more closely integrated with life situation, style, values and activities of individuals:

- Sam's family has a room where different tasks and interests are shared. This socially active family has guests often. A more suitable design solution would be a clapper board like unit with cupboards to shelter private material. Instead of an openly untidy desk to be cleaned for guests, it would provide aesthetical and functional unit.
- Jan and John are mostly interested in leisure time activities but they also work at home. A room with modular furniture elements would configure the environment and support their current activities.
- Peter occasionally sends e-mail at the end of a long day on a business trip. He is interested in aesthetics and invites a friend sometimes for a glass of exquisite red wine in his small apartment. A table with stylish armchairs for socialising and eating, and a small cabinet with wheels next to his sofa for work would better fit his preferences.

The concrete requirements identified in the case study related to equipment, transportation and connections, electrical and telecommunication accessibility, storage and working position can be used as a check list for design. The primary result is the illustrated stories of individual eWorkers everyday life situations, which can be utilised to support design empathy, inspiration and understanding the phenomenon.

8. Conclusions

In the presented case 'eWork at Home' holistic personal aspects of home and many overlapping and even contradictory activities were progressively unfolded. To the company representatives a new layer of understanding grew through their active participation. The company representatives stated the complexity of user segments when considering home context. Rather than crystallizing a stereotypical, average resident, user or eWorker, individual preferences were emphasised. Users are all individuals with varying needs and there is no sustainable or commercial sense in offering the same solutions for all of them. Thus, the most familiar office-like home-office is now seen as only one solution.

In fact, designing future eWork homes and furniture should emerge from lifestyles, activities, personal preferences and ways of working. Although ease of use and availability of technology are crucial, design emphasis should be on living at home and on activities, such as spending time together, doing hobbies or work. Home-office solutions should allow more variation also for social interaction. Apartment and furniture should allow flexible possibilities for re-configuration of environments according to the current life situations and activities and could be improved with ambient intelligent.

The future challenge is to grasp the novel understanding, and to use it as an inspirational starting point for designing homes, furniture and other related facilities for people working in the middle of living. Ideally, different aspects of the environment are developed with common visions. Co-operation should include user-centred approaches or participatory design with eWorkers, employers, building constructors, manufacturers, maintenance and others. Modular and configurable solutions created by the multidisciplinary design teams could enable individual eWork at home in a pleasurable and socially sustainable way.

Acknowledgements

We thank the case participants and companies for collaboration and co-workers at University of Art and Design for valuable feedback.

References

- [1] Gould, John D. & Lewis, Clayton (1985): Designing for usability: key principles and what designers think. In *Communications of the ACM*, 28(3), 1985, 300-311
- [2] Ehn, Pelle & Badham, Richard (2002). Participatory Design and the Collective Designer. In the *Proceedings of the Participatory Design Conference PDC 02*, 1-10. Malmö
- [3] Kyng, Morten & Mathiassen, Lars (1997). *Computers and Design in Context*. The MIT Press, Massachusetts
- [4] Sanders, Elizabeth B.-N. From User-Centered to Participatory Design Approaches. <<http://www.sonicrim.com/red/us/commune/papers/Canadapaper.pdf>>. 6.5.2003
- [5] Sanders, Elizabeth B.-N & Dandavate, Uday (1999). Design for experiencing: New tools. In the *Proceedings of the first international Conference on Design and Emotion*, 87-92. Delft
- [6] Mattelmäki, Tuuli (2003). Probes: Studying Experiences for Design Empathy. In Koskinen, I., Battarbee, K. & Mattelmäki, T. (Editors). *Empathic Design – User Experience in Product Design*. ITPress, Finland
- [7] Buchenau, Marion & Fulton Suri, Jane (2000). Experience prototyping. In the *Proceedings of DIS2000*, 424-433. New York
- [8] Mattelmäki, Tuuli (2003). VÄINÖ – taking user-centred steps with probes. In the *Proceedings of Include Conference 2003*. RCA, London
- [9] <http://smart.uiah.fi/luotain/eng_index.htm>
- [10] Heinonen, Sirkka (2000). Analysis of the Finnish Telework Potential. Ministry of Labour, Helsinki <<http://www.mol.fi/esf/ennakointi/raportit/telework.pdf>>
- [11] Heinonen, Sirkka & Niskanen, Saija (2003). Etätyö työssä jaksamisen tukena. (Telework As A Bridge to Job Satisfaction, in Finnish with an English abstract). Working Papers 16, Ministry of Labour, Helsinki
- [12] Lally, Elaine (2002). *At Home with Computers*. Berg Pub, Cornwall