Lessons from the Life of Domestic Objects:

Design Considerations for UbiComp Devices for Home

Youngmi Choi
Faculty of Architecture, Building and Planning and Department of
Information Systems (Interaction Design Group)
The University of Melbourne, Victoria, Australia

Abstract. Domestic Objects are emerging as a source for embedding ubiquitous computer technologies. The current focus on single objects or a singular function neglects people's diverse functional use of domestic objects and their cultural significances at home. Based on ethnographic interviews, this paper reports how people utilize domestic objects in relation to activities and domestic spaces. The paper concludes with some design considerations for ubiquitous computer devices.

1 Understanding the Domestic Environment

Ubiquitous computer technologies signify a transformation of the traditional form of computers into diverse objects that make up our everyday environment. The discussions on ubiquitous computer technologies initially focused on the work environment until the late 1990s when a call emerged emphasizing the need for exploring the home environment [1, 2]. Together with the growing industry interests in so-called smart home technologies, the home environment has emerged as a new source of design opportunities for ubiquitous computer technologies. At the same time, as the discourse in human-computer interactions expanded beyond the domain of computer related disciplines, researchers in the field began to unleash particular considerations necessary for designing ubiquitous technologies for home.

Three particular research approaches are worth mentioning in the area of designing ubiquitous computer technologies for home thus far developed: (1) understanding people at home as users, (2) designing to support routine activities, and (3) substituting existing functions of home objects with computational devices.

Understanding People at Home as Users

Initially from the work environment and later within the domestic environment, the use of technologies was initially studied from the perspective of technology

adoption and then their influence on the things people do. A range of studies explored the adoption and use of technologies within the domestic environment including technologies for cooking and cleaning [3], telephone [4], entertainment [5] and computers & Internet [6]. The adoption of computers is one area widely researched with a particular focus on its social implications including the use by older people [7], people with a disability [8], young people or people from rural or city location [9], and women [10] as well as the issues exploring the digital divide [11]. In some technology studies exploring the home environment, people are narrowly defined as users with active purchasing power while investigating social and cultural meanings of possessing technological goods [12], how one modifies their use of technologies to suit their likings or purposes [13, 14] and changes that occurred in the life at home, derived from the use of new technologies [6].

Designing to Support Routine Activities

Domestic activities have been studied from a single dimensional perspective, led by extensive investigations into routines activities[15]. A strong focus on understanding the routine nature of domestic activity, though important, risks missing two significant points. Firstly the reactive and adaptive nature of use can be overlooked. For example the introduction of the VCR enabled users to rearrange or change radically their routine activities at home to stretch and distort time. Secondly, it can fail to realize that the ways routine activities are performed and delivered have changed as new ways and means have been introduced to people in the domestic environment. Consider what we have for and how we have breakfast. Over many centuries, we have been having bread and milk for our breakfast while the processes and the forms they get on to our breakfast table might have changed, not to mention the introduction of other ways we resolve our breakfast meals. Hence, identifying routine activities can be a rather inadequate approach to designing ubiquitous computer technologies. This is simply because computerizing these activities by producing a technological device can only be a short term solution to today's ways and means of carrying out our routine activities. As a result, a demand has emerged for a broader viewfinder that lets us see what occurs at home and how we can understand this without limiting or resorting to routine activities.

Replacing Functions of Home Objects with Computational Devices

Another trend in the studies into the domestic environment for technologies is a tendency of investigating the functions of the objects with an intention to convert them into the technological device. This resolute focus on functions can result in overlooking other significant elements influencing the way we relate or utilize objects at home. In addition, this can include objects' multiple functions and invisible relationships with people and their neighboring objects, and how they are related in the space they are placed in.

Essentially supported by activity theory, technology researchers began to explore the domestic life focusing on practical activities in the social and cultural context [16]. Studying the user experience in conducting practical activities has a direct

connection with operating objects (referred to as tools or artifacts) including studying the context of graspable (or tangible) objects [17]. Nonetheless, one potentially significant aspect is overlooked by the researchers taking this approach: While objects are seen as mediating the user activities, they are perceived mainly in their primary functions in many studies. In other words, single objects or singular functionalities of domestic objects are at the centre of these studies.

This view neglects the possibility of other functions it may play, including those modified by users. Highly personal domestic objects may have a multi-dimensional relationship with their owners, and perform 'multiple functions', functions that grow from the user's experience and extend the object beyond its original given roles. The roles played by domestic objects can be heavily influenced by users due in part to the complex social and physical settings of use [18]; use that is rooted in personal and family rituals and defined by powerful emotional attachment within the home environment [19, 20].

The consideration for environment and spatial issues is another aspect being neglected. By concentrating on their primary function, it is easy to neglect the objects' invisible relationship with the way neighboring objects are located and how and where the activities associated with the objects are taking place. The interconnection of space, form and activity is widely discussed in the field of architectural design, which pursues a social analysis of the interfaces between user experience of space and its social context [21, 22]. Neglecting the spatial and environmental aspect, therefore, may lead to overlooking the wider and invisible structure or relationship beyond the objects the user is engaged with. In turn, this approach may fail to articulate the functionalities beyond the primary role of objects originally designed by the designer. Consequently, a need arises for exploring the objects in a deeper contextual manner including their indirect and intangible relationship with their users in order to come up with something that can be utilized in seamless orchestration with their local environment at home and with user activities.

All three of these developments somewhat contribute to building ways of identifying design opportunities and furthering the fit of ubiquitous computer technologies for the home environment. These approaches, however, can be in conflict with how people consider and utilize the meanings and functions of the domestic environment and/or domestic objects. For instance, it is not often that we perceive our life at home as a source for a great improvement through embedding technologies. Hence, taking one of the three developments may lead to a narrow pathway for HCI research into the home environment. Consequently, a need exists for a new direction for a fundamental groundwork about people at home that can suggest a holistic and contextual framework.

Taking this as a departure point, our paper unfolds an investigation into the domestic furniture and its diverse functional use at home. Based on analysis of the field data collected via ethnographic interviews, observation and photography, we discuss four particular furniture pieces –dining table, coffee table, chairs and sofa – and how diversely people utilize them within the physical and social context of home.

2 About the Study

As discussed, future ubiquitous computer solutions need to support more than just the function previously provided by desktop PC in order to accomplish calmness in use. How can this be achieved? This study explored our unremarkable everyday activities centered around domestic objects with an intention to understand functions and meanings in a social and personal context. The aim is to aid the design of ubiquitous technologies for home that can be 'invisible in use', just like those everyday objects at home. Considering that activities never take place in isolation and they are interwoven with other activities that deal with the same or connected objects, we believe that a deeper understanding of user object relationships needs to be obtained in order to learn about the structure and implication of neighboring objects. To achieve this, we initially concentrated on furthering our knowledge of home activities and how people draw out multiple functions from some domestic objects.

We conducted ethnographic interviews and observations with 14 adults (couples or singles) living in metropolitan Melbourne without any children. In each household, we spent minimum of half a day to one day and data was recorded using field notes, photography and mini digital disks. Eight out of 14 were living in a rented property while the rest owned a home. Using ethnographic interviews, observation and photography, we identified significant objects from the participants and analysed their relationship with activities in a particular space. During the analysis process, we kept close eyes on the context of the social and personal meanings of the objects in use and people's spatial experience as well as the participants' meaning of home.

3 Significant Domestic objects

The data from the field revealed interesting insights into the participants' relationship between co-occupants, creating a personal space and performing activities. No strong evidence was shown that home ownership influences the participants' attachment to home as no significant difference were shown in the way the renters and the home owners utilize their home objects and spaces. On the other hand, differences were identified when they placed a stronger meaning or happiness in a certain phase of their life. For instance, amongst the people whose current home is a rental property, they still showed a strong attachment to their current home. All of these people indicated that the meaningfulness of their current homes is because these places are the places they began a couple life with their partners.

In terms of technology objects, the meaningfulness seems to have developed in association with particular people, including themselves or someone associated with the objects or a particular user activity. Most technology objects at home tend to maintain their originally designed primary function. The cases of user-modification in these objects, therefore, were found when users applied the primary function in new contexts aiming for different results. Also, the social, personal or educational value the technological objects generate seemed to give new social functions to them.

The data revealed four general characteristics in the way people utilized significant objects at home and how the meanings impact on home activities. Initial patterns in the relationship between significant objects, activity and space emerged from the field and helped shape further analysis and they include:

- The participants place some significant objects together to create a personal space in order to support personally significant activities.
- Personal space is a place with a sense of connectedness.
- The routine or habitual activities at home communicate messages to co-occupants.
- Patterns of utilizing domestic furniture are influenced by user activities, neighboring objects and the design of the objects.

Based on these characteristics, we further recorded activities taking place in and around the significant domestic objects in the context of their meanings and functions and those of the participants' home. What emerged from this analysis were five noteworthy themes that exhibit roles and implications of the significant objects at home and how people interact with them. The five themes are: Homely ambience, personal relevance, responsiveness to neighbouring objects, multiple functions and user appropriation and meaningful space.

3.1 Homely Ambience –Perceived Suitability for Home

In the two pictures below, we can easily identify that they are showing someone's home because of their 'homely settings'. (Fig 1 & 2 are two different living rooms owned by one person.) An even closer look into one of the pictures can also effortlessly reveal that something is not or may not be quite right for the inside of a typical home: In the picture on the right, two camping chairs are placed in the middle of a living room and most of us would feel that they are unsuitable for a home or 'homely setting.'

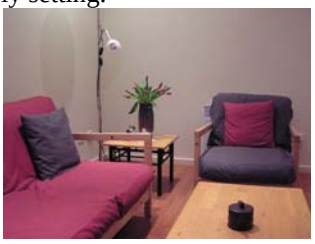


Fig 1 **Fig 2**

Homeliness or homely ambience is hard to define. Judging a place homely or not is a complicated, multi-layered and even personal decision, involving the materials, design appearance or styles and so forth. Comparing the two pictures provide one descriptive case showing how the suitability of home objects can be identified and the reasons for the judgement can be illustrated. In this fashion, we summarize six ways homeliness is judged by our participants and they include:

- Size and materials;
- Perceived usefulness;
- Perceived values attached to the objects – its functions or its meanings;

- Perceived ease of use ;
- Relevance to personal values, identity or history; and
- Objects' possibility of contributing to creating a meaningful space

People develop subjective and personal meanings, beliefs and ideas in making judgements on whether or not an object is suitable for home. To be perceived as suitable for home, an object has to give homely ambience through whichever channel described here. As instantaneous as the judgment may be, the perceived suitability for home environment gives a clear leverage in being accepted by people. This means that a new object for the domestic environment must not rub off the feel of homeliness.

3.2 Personal Relevance

Home is a complex domain represented by a range of social, cultural and personal values. It is a place where one can exercise values such as authority, freedom and privacy [23]. Home is a place consisting of objects and furniture. It can also be the feelings that come from the objects and the spaces composed by these objects. At a first glance, onlookers find it hard to recognize the embodiments of these values at home as they are private so often undisclosed to others. For this very reason, the patterns and effects of how some objects are utilised can reveal values particularly relevant to the owner. The sources for the relevance appear to come from four aspects including personal habit or routine, personal biography, identity and self image. Consequently, the significant objects are embodiments of personal values in real life and the embodiment contributes to the life of the objects at least in four ways:

- They help lengthening the lifespan of objects.
- They provide a trigger for changing the pattern of utilisation.
- They offer mental and emotional interactions to users.

Some domestic objects are shadows of personal values connected to personal identity or an articulation process expressing personal identity. This is the connection, according to Wise, we confirm our territorial ownership of homes that gives the feeling of homogeny of our home and is a representation of us [24]. Consequently, seeking to enhance personal relevance in objects can present new design opportunities as well as leading to designs that can offer a possibility of diverse use, multiple interaction channels and emotional relevance to individual users.

3.3 Responsiveness to Neighbouring Objects & Rituals

A house accommodates various domestic objects that have both physical functions and personal meanings. Some domestic objects, more than other objects, convey cultural values preferred by individuals [25] and provide functions that aid user activities. Studies into domestic objects in the field of human and computer interactions frequently set out from either functions or meanings. While a scarcity can be seen in the number of HCI studies into the domestic objects that attempt to bridge functions and meanings [26], there already exists an established body of

contextual inquires from social and cultural studies [27, 28]. Comparable to these contextual inquires in the field of HCI can be seen in the studies exploring routine activities and lived experience [15, 29]. However, routine activities are fragile to changes triggered by the introduction of new domestic objects. For this reason, they have some vulnerabilities as a design source for emerging ubiquitous computer applications [30]. Alternatively, a contextual approach can lead to designing domestic objects, aligned with the meaning and roles of the home environment and habitual user activities. One way of looking into this complexity is by placing a focus on a ritual situation where objects and activities occur in a particular place and to examine the interactions between the three-objects, activities and place.

How then can we characterise different types of interactions occurring within home? The field work findings reveal four ways people arrange and utilize objects at home and they include:

- On the pathway of an action flow: Objects are arranged and utilized as the user conducts a stream of activities.
- Enjoying the benefit of a house fixture: Objects are arranged in a way the user can take advantage of certain house fixtures such as windows, TV or heater.
- Offshoot of a fleeting action or situation: Objects are utilized to cope with a temporary situation or spontaneous activity.
- Budding up the experience of habitual activities: Objects are placed in a close proximity to a particular activity to strengthen the experience of conducting the activity.

Drawn up from the way people utilising objects within a particular space, the above four ways address the ways that the domestic objects are utilized. They bring two suggestions for designing of any emerging devices for home: one) objects need to be responsive to objects in a close proximity, and two) objects need to be responsive to a stream of activities.

3.4 Multiple Functions and User Appropriation

People are known for their capability of making and using tools since the discovery of the earliest bipedal hominids, Australopithecus. While people have continued to develop tools for their activities, discussions around people and objects they use have also continued. In the area of technology research, a noteworthy endeavour was made to design what better supports human activities by shifting its focus from end products to end users. This shifting focus on end users began to emerge amongst some researchers by the CSCW (Computer Supported Collaborative Work) movement [31] and study of technology adoption and domestication [12] during the period when personal computers began to appear in the work environments. At the centre of this focus is a claim that objects, particularly those well-designed ones, are complementary to human activities [32]. Consequently, designing with an emphasis on the fit of objects in people's everyday life illuminates

ways and means of naturalising object's intrusion into people's private domains. One vital way to achieve this is to understand how people cultivate and utilise objects in their everyday life.

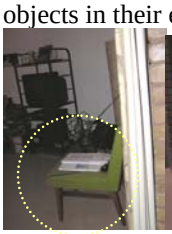


Fig 3 **Fig 4** **Fig 5-1** **Fig 5-2**

My fieldwork data revealed some evidence of people's appropriation in two ways—drawing up multiple functions by adding new functions, and replacing the originally designed function with a new personalised one. Objects used with new functions included Fred's dining table, GuangWu's tea table. As shown in picture 3, Fred places books and notes on a chair placed next to the entry so that he can be reminded to take them when he goes out. He says that he uses it as if it were an '*in-tray*' and '*out-tray*' (See Fig 3). GuangWu uses his plastic container with a lid as a tea table by covering it with an orange colour cloth and placing it between two armchairs in the living room (See Fig 5-1 & 5-2). In terms of introducing new functions, Fred was utilising his dining table as a study desk accommodating a PC (See Fig 4). Previously introduced in the earlier pattern, Alex's use of a blue mobile phone cradle also falls into this category.

Results of the field observation can be summarised as follows:

- In the case of drawing up multiple functions, objects are used on the basis of either temporary or habitually repetitive use. They maximise a personal experience within a certain locus and can be utilised spontaneously.
- On the other hand, the newly replaced functions appeared to be permanent until a new object or activity is introduced. They also appeared to have been accepted on the grounds of emotion and the relationship.
- Some objects perform single functions only and electric appliances primarily perform single functions.
- Ten factors appeared to be influencing user introduced functions and they include: time and occasion of use, physical location, shape and material, user's habitual tendencies & ritual activities, original function, influence of co-occupant's activity or behaviour, personal and social meaning and function of the accommodating space, user's social and cultural intention, use of other/ significant objects, and personal and social meaning of the objects.
- User introduced functions when it can be socially justifiable.

An object designed in consideration of the above list will have a longer lasting life span beyond its novelty affect and accurately meet user activities and the context of use.

3.5 Meaningful Space

Home plays both physical and psychological functions. Within this structure, people organise domestic objects to meet activities or images particularly important to them. This was an evident development in the bourgeois interior since the 19th century: a private and individualised interior was seen by choosing and arranging of objects than by the physical nature of space [33]. This adds complexities in the understanding of the domestic environment by presenting double layers for meaningfulness and practical functions to both home as a physical structure and a place that accommodates personally meaningful objects. The meaningfulness is a symbolic representation that counteracts a notion of mere passive consumers in the modern world. It is rather an evidence of cultural consumption, Hugh Mackay explains, that balances between constraint and creativity and the role of consumption [34]. What this tells us is that both home and objects perform physical and psychological functions to users that add complexity in understanding the domestic environment. This complexity can be overcome by placing a central focal point in how people create a particular space within home including reasons for and elements constructing the space. Consequently, there is a need for examining domestic objects in relation to spatial placement and user activities both in the physical and psychological functions they perform.

My field data revealed the four cases where significant objects contributed to construction of a meaningful place:

Arm chair I: Brian uses his armchair as a central piece in constructing a place where he can replace his experience of personal space and freedom he used to have in his old garage.

Dining table: Fred currently uses his dining table as a study desk to accommodate his PC.

Sofa: Ian studies from his sofa in the living room where he can overlook the outside. He enjoys looking out and the feel of being in the air by watching his apartment from the 5th floor.

Armchair II: Fiona set up a corner where she placed her red armchair for reading. She also placed other objects to enhance her experience of reading such as books and a bookshelf, a reading lamp and incense.

Extracted from the field data, three distinctive characteristics of meaningful places were witnessed:

- Users create a personal space with home to accommodate personally meaningful activities & the significant domestic objects that supports those activities.
- The personal space is a place with a sense of connectedness.
- Routine or habitual activities are a proxy communicator amongst family/close people

Based on the field data, a meaningful space is constructed for performing a particular activity. In other words, meaningful space is an activity centre for a personally meaningful activity. Construction of meaningful space appears to be based on three triggers: domestic fixture, user's social & psychological activity, and routine or ritual driven.

This understanding contributes to designing objects that meet both practical and psychological functions and that meet the context of ritual usage. It can also help

direct to potential design opportunities by adding or combining functions, identifying user behaviour patterns in a particular physical setting, and providing a clue for mapping the domestic objects in relation to user activities and other objects in a particular domestic space. Finally this understanding can also help evaluate the fit of new designs for home.

4 Design Considerations for Home Ubiquitous Computers

The findings provide useful considerations for the design of ubiquitous computer technologies for home, in particular when embedment of computer technologies involves utilization of existing domestic objects. The lessons from the field can aid initial design ideas and evaluating the appropriation of interface design.

The five themes that emerged from the field work can help generate initial design ideas that fit the user perceptions and the current usage patterns of significant objects at home. Theme three and four, for instance, reveal how people use objects to construct a personal space in order to conduct activities significant to their everyday life. They show how a collection of objects are accommodated in a close proximity and, in some cases, how their functions are manipulated in order to support a stream of activities to enhance personalised user experiences. The amalgamation of different objects in a personalised space can also inspire initial design ideas. Initial design ideas can be derived from the way people appropriated the functions of existing objects by introducing new functions or replacing existing functions.

The five themes can be used for evaluating the appropriation of interface design. The details presented in the five themes portray the types of interactions people have with the domestic objects. The theme, responsiveness to neighbouring objects, for instance, shows people's attempt to experience a core stream of activities underpins the type of objects amalgamated in a physical space. It shows that, in order for people to maximise their experience, objects need to be designed in the context of objects and their associated activities in the neighbouring area. In some cases, a sequence of user activities needs to be considered in the design process to enhance the user experience. Personal relevance people find in domestic objects are also seen as important in shaping interaction patterns as it is an embodiment of social cultural values. This highlights a need to incorporate ways and means for people to create personal relevance.

The findings of this study help answer the question of the 'what and how' in designing ubiquitous computer technologies for home. This was done by collecting and analyzing empirical data on people's everyday life at home beyond the currently prevalent problem-solution paradigm in HCI design. The study demonstrates that everyday life at home needs to be understood in the context of domestic activities and the use of objects to better assist the designing of ubiquitous computer technologies.

5. References

1. Hindus, D.: The Importance of Homes in Technology Research. In: N. Streitz, J.S., V. Hartkopf, S. Konomi (ed.): The Second International Workshop on Cooperative Buildings (CoBuild'99). Cooperative Buildings - Integrating Information, Organizations, and Architecture, Pittsburgh (1999)
2. Harper, R.: Inside the Smart Home: Ideas, Possibilities and Methods. In: Harper, R. (ed.): Inside the Smart Home. Springer, London (2003)
3. Shove, E.: Comfort, Cleanliness and Convenience. Berg, Oxford (2003)
4. Marvin, C.: When Old Technologies were New: Thinking about Electric Communication in the Late Nineteenth Century. Oxford University Press (1990)
5. Barnouw, E.: Tube of Plenty: The Evolution of American Television. Oxford University Press (1992)
6. Venkatesh, A.: An Ethnographic Study of Computing in the Home. Working paper. University of California, Irvine, Irvine (1996)
7. Crabtree, A., Hemmings, T., Rodden, T., Cheverst, K., Clarke, K., Dewsbury, G., Hughes, J., Rouncefield, M.: Designing with Care: Adapting Cultural Probes to Inform Design in sensitive Settings. OZCHI 2003: New Directions in Interaction: Information Environments, Media & Technology. University of Queensland, Brisbane, Australia (2003)
8. Dewsbury, G., Clarke, K., Rouncefield, M., Sommerville, I., Taylor, B., Edge, M.: Designing Technology in Homes to Meet the Needs of Disabled People. Technology and Disability (2003)
9. NOIE: The Digital Divide. Vol. 2004. NOIE (National Office for Information Economy), Canberra (2003)
10. Zimmerman, J.: The Technological Woman: Interfacing with Tomorrow. Praeger, New York (1983)
11. Selwyn, N.: Apart from Technoogy: Understanding People's Non-Use of Information and Communication Technologies in Everyday Life. Technology in Society **25** (2003) 99-116
12. Mackay, H.: Consuming Communication Technologies at Home. In: Mackay, H. (ed.): Consumption and Everyday Life (Chapter 6). Sage Publications Ltd, London (1997) 259-308
13. MacKenzie, D.A., Wajcman, J.: Introductory Essay. In: Mackenzie, D.A., Wajcman, J. (eds.): The Social Shaping Of Technology. Open University Press, Milton Keynes UK (1999) 3-27
14. Carroll, J., Howard, S., Peck, J., Murphy, J.: From adoption to use: the process of appropriating a mobile phone. Australian Journal of Information Systems **10** (2002)
15. Crabtree, A., Rodden, T.: Domestic Routines and Design for the Home. Computer Supported Cooperative Work (2004) 1-30
16. Bannon, L., Bodker, S.: Beyond the interface: encountering artifacts in use. In: Carroll, J.M. (ed.): Designing Interaction: Psychology at the Human-Computer Interface. Cambridge University Press., Cambridge (1991) 227-253
17. Fitzmaurice, G.W.: Graspable User Interfaces. Department of Computer Science. University of Toronto, Toronto (1996)

18. Moore, J.: Placing Home in Context. Journal of Environmental Psychology **20** (2000) 207-217
19. Tuan, Y.-F.: Space and Place: The Perspective of Experience. University of Minnesota Press, Minneapolis (1977)
20. Csikszentmihalyi, M., Rochberg-Halton, E.: The Meaning of Things: Domestic Symbols and the Self. Cambridge University Press, Cambridge, UK (1981)
21. de Certeau, M.: The Practice of Everyday Life. University of California Press, Berkeley (1984)
22. Goffman, E.: The Presentation of Self in Everyday Life. Allen Lane, Penguin, London (1969)
23. Morley, D.: Home territories: media, mobility and identity. Routledge, London (2000)
24. Marcus, C.C.: House as a Mirror of Self: Exploring the Deeper Meaning of Home. Conari Press, Berkeley (1995)
25. Bourdieu, P.: Distinction: A Social Critique of the Judgement of Taste. Routledge and Kegan Paul, London (1984)
26. Dourish, P.: Where the Action is: The Foundations of Embodied Interaction. MIT Press (2001)
27. Seigworth, G.J., Gardiner, M.E.: Rethinking Everyday Life: and then nothing turns itself inside out. Cultural Studies **18** (2004) 139-159
28. Van Loon, J.: Social Spatialization and Everyday Life. Space and Culture **5** (2002) 88-95
29. Nagel, K.S., Hudson, J.M., Abowd, G.D.: Between Dinner and Children's Bedtime: Predicting and Justifying Routines in the Home. Vol. 2006 (2005)
30. Choi, Y., Howard, S., Dave, B.: The Secret Life of Domestic Objects: their multiple functionalities: understanding their triggers & influences from the user context. OZCHI, Canberra, Australia (2005)
31. Greenbaum, J., Kyng, M. (eds.): Design at Work: Cooperative Design of Computer Systems. Lawrence Erlbaum Associates, Hillsdale, NJ (1991)
32. Norman, D.: Things That Make Us Smart: Defending Human Attributes in the Age of the Machine. Addison-Wesley, Reading, Massachusetts (1993)
33. Perrot, M., Guerrand, R.-H.: Scenes and Places. In: Perrot, M. (ed.): A History of Private Life, Volume IV, From the Fires of Revolution to the Great War. Harvard University Press, Cambridge, MA (1990)
34. Mackay, H.: Consumption and Everyday Life. Sage, London (1997)