Dwelling as Collaboration: From Experimental Architectural Design to Well-Functioning Housing

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ABSTRACT
In this paper we describe dwelling as a collaborative activity including continuous redesign of living arrangements, based on an ongoing study of an experimental student house in Trondheim, Norway. We suggest dwelling as an interesting case for PD research, with special consideration of users' interpretation, use and redesign of, in this case, interior architecture. Theories of awareness and script are suggested to inform these analyses of dwelling.

Author Keywords
Dwelling, Collaboration, Continuous design, Awareness, Script

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION
Housing (i.e. providing accommodation) is one of many people's most precious topics, as it involves not only a vast range of practicalities of living, but also aspects related to personality, identity, style as well as economic success. However, in the growing research on socio-technical systems, stemming from CSCW (computer-supported cooperative work), CHI (computer-human interaction), PD (participatory design) and STS (science and technology studies) studies related to housing have been relatively few. In this exploratory paper, we draw attention to aspects of housing that are relevant for the PD research community (as well as related research traditions).

We will focus on the collaborative aspects of dwelling (i.e. living in a specific place), with special emphasis on how living close together in itself includes aspects of participation in continuous reconfiguration and design processes. We are especially concerned with the interface between professional (architectural) design and lay approaches to design issues, i.e. how architects and dwellers may challenge each other's views on housing-related qualities. To be able to put as much emphasis on the design issue as possible, we study the use of a newly built experimental student house in Trondheim, Norway. By studying a rather extraordinary case, we do not (at this point) strive for high degree of generalisability. Rather, we suggest that the special character of the dwelling arrangement in our study makes it easier to identify collaborative aspects of continued design processes. Our study is still in progress and our empirical reporting in this paper is based on the first stage of the study.

This paper is structured in the following way: First we will describe our case, the experimental student house. Second, we will briefly outline two theoretical perspectives that inform our analysis. Third, we sketch the research methods that form the basis for this study. Fourth, we will present our analysis with emphasis on collaborative aspects of dwelling. At the end of the paper we very briefly summarise our findings and how the project is to be continued.

THE TRESTYKKER STUDENT HOUSING PROJECT
The TreStykker housing project in Trondheim is a result of a student workshop initiated by three local students, attracting 35 students of architecture from Bergen, Oslo and Trondheim, to plan, finance and build a small experimental student house during the summer 2005. The workshop was run by students themselves, but mentored by the architectural firm 3RW Architects in Bergen. Around 70 local firms and organisations supported the project financially it with a sum similar to ca €250.000. With students as core participants and managers of the project, the house represents a statement of this group of students. The background for the proposed solution can be regarded as a result of the students' fields of study, their personal experiences and lifestyles, as well as keenness to challenge the design of existing (student) housing solutions. The project group's overall intention was to propose a different way of designing and conceptualising a student residence.

The proposal resulted in a unit that provides a 46 m^2 open space, containing an open kitchen and a separate bathroom.

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Figure 1. One of the sleeping boxes with opened front

Also the main construction is, at least in a Norwegian setting, alternative, as it is constructed of massive wood elements. Two of the four outer walls are mostly consisting of large floor-to-ceiling windows and doors, rendering the main living space quite open to outside passers-by, as well as providing great views from the building. The house's site is strikingly visible and centrally located in a large parking lot in the city of Trondheim, close to the city centre and the Nidelven River. The open facade is actually leaning over the river with a wide porch.

The unit is designed for three inhabitants, each with their own moveable 'sleeping box' on about 2.5 m^2, as a minimal private space (Figure 1). The boxes have wheels, and by moving the boxes around, the open common space can be configured in different ways to be used for different purposes (Figure 2). It is therefore first of all the sleeping boxes that represent the flexibility that the designers were looking for. The boxes are probably the most unusual elements in the unit compared to common housing solutions. They are substitutes for private bedrooms, but do not provide the same level of privacy and space, as even a small permanent bedroom would.

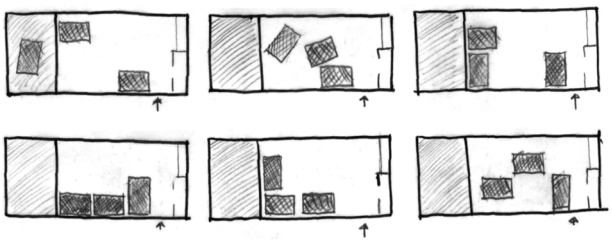

Figure 2. Sketches showing some possible arrangements of the three sleeping boxes (grey = porch)

In contrast to the experimental unit in the Trestykker project, other student housing projects do not provide flexible dwellings for students. Institutionally provided student houses (such as those provided by the Norwegian universities' student unions) are rather characterised by a repetition of the same dwelling types. In the more recent student housing projects in Norway, there has been an emphasis on single-unit housing. The students' proposal in the Trestykker project suggested another, new variant of shared housing, providing minimum private space and asking for (or demanding!) maximum social visibility and interaction. The option for solitude in a private room is highly limited. As such, when the tendency in student housing development in Norway is directed towards increasing private space and less shared facilities, it is interesting to see that students themselves proposed a more socially transparent housing structure, where private space is reduced to a minimum.

The proposed design represents a solution in which individual choice and involvement is asked for. This flexible home is supposed to provide the dwellers with the freedom to adapt their space to immediate personal requirements. In fact, the dwellers have to work actively with their in-door configuration in the (re-)creation of their dwelling.

THEORETICAL CONSIDERATIONS

As theoretical points of departure in this paper we will apply the notion of awareness and attention from the CSCW literature, as well as script from STS literature.

Awareness

While 'attention', meaning mental focus or concentration [1], has not been much applied in the CSCW literature, the term 'awareness' has been widely used within CSCW research. However, as noted by Schmidt [2], the term 'awareness' has been found to be equivocal, and is being used in increasingly contradictory ways, often in combination with additional adjectives to specify a special meaning, such as 'peripheral awareness'. While the term awareness, according to Dourish and Bellotti [3], means understanding of the activities of others as a context for one's own activity (i.e. with a somewhat passive nature), 'attention' may be used for a more active observation and engagement in the activity of other people. By attention, we put emphasis on an actor's deliberate interpretation of and engagement in, colleagues' ongoing activities. Because there are often several actions happening at the same time in one location (for example in a house with several inhabitants), the dwellers' attention is of great importance. To study at home for instance, they need to concentrate on their own tasks even if there are other activities going on in the same room. Co-habitants might also need to be attentive to other's actions, to be able to support tasks that are regarded collaborative (such as tidying a common area) or to help the others to establish privacy. Any dwelling situation may therefore be characterised by 'multiple, interacting participating frameworks' [4] or 'peripheral participation' [5], and the successful dwelling in the TreStykker project may in particular rest on the inhabitants awareness and attention of the others.

Script

The script perspective [6] has been accepted within the STS research community as useful for analysing the social construction of technology on a user level. The term *script* is suggested by Akrich [6] to the analysis of the relationship between users and technologies. Like a film script, 'technical objects define a framework of action together with the actors and the space in which they are supposed to act' [6:208]. A study applying the script perspective will focus on how designers of technical objects 'define the users with specific tastes, competences, motives, aspirations, political prejudices', and so on. A major task for innovators is therefore that of '*inscribing*' a vision of the world in the technical content of a new object. Methodologically, researchers

'have to go back and forth between the designer and the user, between the designer's projected user and the real user, between *the world inscribed in the object and the world described by its displacement'* [6:208-9]. It is in this variation we obtain access to the relationship between 'users' reactions that give body to the designers' project, and the way in which the user's real environment is in part specified by the introduction of a new piece of equipment' [6:209].

One of the analytical strengths in the script perspective is the way it proposes active and well-informed users and designers, as opposed to the more conservative consumer process [7] that the *domestication* perspective has been based on. In the script perspective the designer of a technical artefact is supposed to draw a scenario of the object as used by its user in the future, and this scenario will be applied by the designer for instance to make 'decisions about what should be *delegated* to a machine and what should be left to the initiative of human actors' [6:216]. Users, on the other hand, interpret the meaning of technical artefacts in various ways. Some users will apply devices in ways that do not diverge too radically from those predicted by the designer, and according to Akrich, it is then 'likely that the script will become a major element for interpreting interaction between the object and its users' [6:216]. However, many users will tend to use devices in other ways than predicted by the designer. In Akrich's [6] terms, these users will not follow the script. Other scholars have suggested an extension of the script perspective, for example Gjøen and Hård [8], who apply the term 'user scripts' on the way electric vehicle owners drive and view automobility differently than the established *political* and *engineering* scripts. In this study about experimental dwelling it seems relevant to look for the designer's (architects') script in the architectural design of the Trestykker house, as well as the development of user scripts in the way dwellers challenge the house as they go along adjusting designed details.

RESEARCH METHODS

A combination of semi-structured interviews, focus group interviews and diaries (self-reports from informants) have been used in the study of the TreStykker housing project. In 2006 also an observational design involving web cameras will be applied.

Semi-structured (qualitative) interviews were used as one of the main data collection methods, to obtain knowledge and information about the dwellers' personal opinions and experiences. Two individual interviews with each student, and two group interviews were conducted throughout the whole dwelling period to trace the experiences made in relation to expectations.

A *diary* on a weekly basis has been used to ask for reflections about the dwelling situation as it is developed. The dwellers were asked to summarize their impressions and experiences, referring to catchwords relating to social and physical aspects of dwelling.

In the interviews and the diaries, the students have told us about their visions and how they approach their daily life in the experimental student house. Of course these data are personal and subjective, and represent underlying motivations (for telling a story) as well as the experienced stories themselves. The interview material was transcribed and read several times and sorted inductively according to different themes found in the text.

In the next phase of the project, during late spring 2006, observation with web cameras (taking still images) will be applied to strengthen the documentation of physical changes

FINDINGS

In this paper we will focus on two findings from the first part of the project, (1) that the flexibility of the housing arrangement is applied both because of needs and as an effect in itself, and (2) that a collaborative aspect had to be developed to be able to utilize the flexibility.

Flexibility

The TreStykker dwelling can be compared to a changing scene, where the open room is the main scene, which is used to sleep, to eat, to work, and to party. The moveable furniture and the sleeping boxes are the requisites to alter the scene according to needs. Before moving in, many expectations for the use of the room were uttered and the sleeping boxes were considered odd and funny, for example as reported by Peder, one of the inhabitants..

'Those boxes, they are really strange. That's what I like with them. The house should have been bigger so we actually could have moved all the boxes in one corner to establish a dance floor' (Peder).

Reflecting about the use of flexibility, Peder thinks that human beings quickly establish a routine, which is what he *expected* from the use of the boxes. However, he *hoped* that they would move the boxes around occasionally, at least in the beginning to find a practical solution. Also Kristian, the other male dweller, *expected* the boxes not to be moved several times per day. But once in a while, when a new room constellation is required they would take advantage of the flexibility. He thought that the boxes would be moved a lot in the beginning, and after some time it would be less. But still he meant that the boxes *must* be moved to adjust the space functionally. He expected that the flexible solutions included in the boxes would be used on a daily basis:

I think we will change a lot in the beginning and then I think it will be stabilised...and then I believe they will be moved – you just HAVE to move them, it's functional, because there are a lot of visitors, so it is practical to refurnish a bit' (Kristian).

Flexibility is not a new topic in house architecture. As a vision or a manner to adapt dwellings to different purposes and phases in life, flexibility has been a relevant discussion in architecture. Flexibility must not necessarily be seen as moveable elements but can also be a 'neutral' plan solution,

where the rooms are not pre-defined for specific use, but are all of an equal size. Flexibility can be based on different time-spans. Some flexible solution may be changed within a couple of minutes, while others involve a greater effort and are for a longer period.

Collaboration

The students did not expect much private life when moving into the unit. All the three of them emphasised that their need for private life was low, probably lower than it would be for many other people. Peder expected less private life in this unit than he is used to. He thinks intimacy may become a critical aspect when living so close together with others, but he did not expect this to become a problem for himself. Peder sees the main intention of the unit in crossing the boarders of the private life people are used to in our society. Kristian says that everybody needs to spend some time alone, occasionally, but he is more interested in living together with others in a social place, than in a place with more private spheres.

The experiences of the students show that when living so close together, it is important to take the other's activities into consideration in the planning of the daily life. This requires good communication and collaboration between the inhabitants to avoid irritation and misunderstandings. Anne puts it as follows:

'You HAVE to be very tolerant. And if you are, everything is fine. One cannot have too many strange habits' (Anne).

The low level of privacy has been pointed out frequently, especially in public discussions. In Norway, a country with an average of 50 m² indoor space per person, the voluntarily abandonment of a spacious private area is difficult to explain to many people.

DISCUSSION

Being only an exploratory paper, a discussion is in development. However, for PDC2006, our main points (or questions) include (1) the relevance of collaborative aspects of dwelling and (2) perspectives regarding interfaces between housing design as continued lay design and (a more stabilized) architectural design. We will address housing as an interesting case for PD, not at least seen in the light of people's actual self-design projects (DIY tradition). The experimental case discussed here extends such cases since it seem to demand a special care from the dwellers towards more specialized design principles.

Living in the TreStykker house demands an extended awareness of co-habitants' needs, for example for privacy. This may be explicated by a readiness to reconfigure the sleeping boxes to redesign the interior space for the consideration of the others. While *architectural scripts* define the sleeping boxes functionally, the dwellers need to develop '*social awareness scripts'* to redesign the space as a whole, for instance to deal with limited privacy. The physical limitation of the dwelling (architectural script) demands creative user scripts to apply the flexible solutions to redesign the dwelling towards (socially) functional housing.

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