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# House 2.0: Towards an Ethics for Surveillance in Intelligent Living and Working Environments

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## Abstract

The basic research questions of this paper are concerned with emergent surveillance-related technologies and practices in connection with intelligent buildings at work and at home: How do these technologies and practices change the flows of information? What are the surveillance potentials? What are the ethical consequences? In the first chapter, I explore three aspects of what a house is. Firstly, I study the history of the house of the future and discuss the opposing conceptions of dream and nightmare. Secondly, I take a look at the distinction between house and home/workplace. Thirdly, the inhabitants of the house will be discussed. The second chapter focuses on future housing as imagined today with regards to surveillance and ethics. Firstly, I discuss surveillance studies in relation to home and workplace. Secondly, characteristics of the house of the future will be discussed. Thirdly, I discuss ethical architecture and design. The paper concludes that the futuristic, technologically-enhanced house seems to be just around the corner. Not in the sense of *The Jetsons* as home or *Star Trek* as workplace, but as an adaptive environment that have the potentials to empower people at home and at work. For that reason, it seems important to focus on the inhabitants of the home and the employees at work rather than solely on architectural and technological possibilities. House 2.0 should not just be a projection of today's houses with extra technology, but a place that facilitates new and better ways for life, work and ethical action.

**Surveillance, ethics, intelligent house, home, workplace, architecture, user-centered design**

## INTRODUCTION

*Home, Sweet Home.*  
(John Howard Payne)

The basic research questions of this paper are concerned with emergent surveillance-related technologies and practices in connection with intelligent buildings<sup>1</sup> at work and at home: How do these technologies and practices change the flows of information? What are the surveillance potentials? What are the ethical consequences?

The rationale behind the intelligent building is a vision of a more “natural” interaction with computers. In this way computers become less visible, if not invisible, as they become part of the surroundings rather than objects that need direct “instructions” through an interface. Thus, the intelligent building – home or workplace – is conceived as a caring environment where computers adapt to human existence rather than the other way around. However, this sympathetic idea raises important ethical questions. In order for the intelligent building to be an adaptive, caring environment, it needs to generate quite a lot of information about the behavior and lifestyle of the inhabitants. Basically, the perfect intelligent building needs to spy on everything that goes on within the walls of the home and the workplace. The generated information, which separately may seem “harmless”, will

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<sup>1</sup> The intelligent building has also been known by similar expressions such as “the smart house” or “the digital house”. I do not differentiate between these terms, but simply consider them different expressions of the same concept of futuristic housing dominated by pervasive technologies.

flow together and form a “data double” of the inhabitants and, as the intelligent building is connected to the outside world via the Internet, the invisible computation has the potential to make home and work life visible to the world. At least, that is the worst case scenario.

However, there is another side to surveillance. The versatile character of surveillance – control, care (Lyon, 2001, Lyon, 2002, Lyon, 2003) and even entertainment (Albrechtslund and Dubbeld, 2005, Albrechtslund, 2007b) – is well-known within surveillance studies and this conception thus encompasses both negative aspects, such as the possible violation of civil rights, as well as the positive, enabling and entertaining features. Similarly, surveillance studies has a history of studying architecture (from the Panopticon to, now, House 2.0) that distributes power, sorts individuals and changes the framework for ethical action. In this paper, I will lean on this tradition and study the intelligent building as a computationally altered architecture that fundamentally changes the basis of life and ethical action at home and at work. I will discuss and address the challenges on the way towards an ethics for new surveillance in living and working environments.

## HOUSE 1.0: WHAT IS A HOUSE?

In this chapter, I will explore three aspects of what a house is. Firstly, I study the history of the house of the future and discuss the opposing conceptions of dream and nightmare. Secondly, I take a look at the distinction between house and home/workplace. Thirdly, the inhabitants of the house will be discussed.

### **Back to the house of the future**

The history of the house of the future is characterized by two contrasting visions: The dream of efficiency and the privacy nightmare. I will discuss both of these visions in turn.

#### *The dream of efficiency*

Interestingly, the idea of “the house of the future” has a rather extensive history<sup>2</sup>, which carries a dream of efficiency for homes and at workplaces. The great exhibitions – initiated with the Crystal Palace Exhibition in 1851 – has since the beginning been a showcase for progress in engineering and technology. Among the things exhibited were also inventions for work and especially domestic purposes. At first, these things were standalone products, however, gradually they were embedded in their contexts of use, in particular the imagined home of the future.

Efficiency is a focal point for housing of the future, as imagined in the first part of the twentieth century, and this has been noticeable in the American context in particular. F.W. Taylor’s *Principles of Scientific Management* (1911) introduced efficiency as a primary virtue of American culture, and the impact of this way of thinking is so profound that it became a matter of course (Bell and Kaye, 2002:48). Taylorism in the context of house planning is synonymous with the rationalization of every detail in the household from movement patterns to the overall architectonic planning.

Even though efficiency and rationalization is less evident in the European tradition of architecture, we should be reminded that the Swiss architect, Le Corbusier, referred to his houses as *machines à habiter* (“machines for living in”) in his famous book from 1923 *Vers Une Architecture* (“Towards a New Architecture”). These “living machines” were a purist response to the demands of the machine age, stripped of all kinds of superfluous ornaments they suggest the efficiency of the factory assembly line. These houses, that are well suited for mass production, were in part an expression of Le Corbusier’s fascination with machine aesthetic and in part a suggestion to solve the rapidly growing housing problems (Gallagher, 2007).

Taylorism and living machines express a desire to rationalize the procedures of the house. Family and work life alike, the idea of the most efficient way of going about business is embedded in the walls and spaces of the future. This vision of the future is well-known from popular culture. America has been presented with parodies of future living, e.g. by the animated television series *The Jetsons*, always reminiscent of the nuclear family ideals<sup>3</sup>, but equipped with robots, video phones and voice-automated appliances. Similarly, *Star Trek* and other space shows can be interpreted as a

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<sup>2</sup> This part is indebted to the presentation of the history of future housing in:

Bell, G. & Kaye, J. (2002) Designing technology for domestic spaces. *Gastronomica*, 2, 46-62.

<sup>3</sup> Interestingly, *The Jetsons* and *The Flintstones* – another popular animated television series – seem very alike despite their temporally very different settings (the Stone Age and a future age). A possible explanation is that the two families share the same (nuclear) values.

vision of future workplaces and, again, this dream of the future combines twentieth century workplaces *plus* time-saving technologies, rather than present new ideas for ways of working.

### *The privacy nightmare*

In the late 90's, *Big Brother* emerged as a popular European television show. The program, which has grown into an international success, centers on the life and social relations of the inhabitants of a special-designed house. A great number of surveillance cameras have been installed in order for an outside audience to follow daily trivialities and intrigues of the people inside.

Even though the people of the future are not participating in a competition to win a money prize, it has been suggested that future living and working environments might be as transparent as if being in the Big Brother house. In her article discussing the Smithsons' 1956 House of the Future project, Beatriz Colomina (2004) calls attention to the surveillance issue. The house is an imagination of a domestic space in 1981, but it was often referred to as the house of 1984, hinting at George Orwell's famous novel. A review at the time of the 1956 exhibition stated: "The loudspeaker telephone, the aluminum foil walls that form 'a discontinuous membrane between all houses,' the omnipresent eye of the color television sets – these suggest 1984 more than 1981" (quoted after Colomina, 2004). A headline in a newspaper was "Housewife's dream – It May Be 1984", reminding us that the house of the future embodies the schism between dream and nightmare, and goes on humorously to say "If Big Brother is watching he will see that TIGHTS are definitely The Thing to wear" (quoted after Colomina, 2004).

In a special report, the online magazine ZDNET discusses the dark side of what they term "the digital home" (Lemos, 1999). The report raises questions regarding the flow of information generated by automated appliances imagined for the house of the future. Program director at the Privacy Rights Clearinghouse says: "The wonderful convenience systems in our homes require lots of information about us. The question is where that information will be kept. If it is kept within our home, fine. [...] But my guess is it won't stay there" (quoted after Lemos, 1999). This privacy concern has to do primarily with corporate surveillance of consumers, however, when the appliances in the digital home gather information while servicing the inhabitants, the traditionally private space surrounded by the walls of the house is invaded.

### **Houses as home and workplace**

It can be argued that a house is not the same as a home or workplace. The argument goes that houses can be the physical space that surrounds a domestic or work environment, or, as Bell and Kaye puts it: "[p]eople inhabit homes; technology powers houses" (Bell and Kaye, 2002:46). In the following, I will discuss houses as respectively homes and workplaces.

#### *What is a home?*

A few years ago a Danish real estate agency with the apt name "Home" launched a series of television commercials that focused on the meaning of home. The company interviewed a number of Danish celebrities and asked them to share their thoughts on what they considered to be a home. Among the suggestions were "home is where you can scratch when it itches", "home is a place that smells of love" and "home is where you can dance very poorly".

These statements have in common that a home is considered to be a private place. This is in line with the idea of the home as the symbol of privacy, or, to put it differently, home as the geographical place of privacy. This is somewhat in contrast to the many current television series that focus on the home (renovation, real estate quiz, displaying celebrities' houses, etc.). In these shows, the home becomes a public space with the television audience as voyeurs. The home is here a representation of life as well as an indicator of social status with an inherent ideal of family living. However, the home has also, historically, been considered to be the cradle of the *petite bourgeoisie*, the suburban lifestyle dreaded by counterculture people and progressive artists. In this vision the home is a prison-like place with a respectable surface appearance.

Even though home refers to the relation between people and geographical places, this does not necessarily mean that a home is a fixed spot. In his 1951 essay "Bauen Wohnen Denken" ("Building Dwelling Thinking"), Martin Heidegger discusses the relation between these three concepts. He says that there is a connection between building and dwelling, since we often build something in order to facilitate dwelling. Although not all building is for this purpose – e.g. the building of bridges, power stations and roads – these places still have some connection to being at home. Like

the truck driver is at home on the highway (Heidegger, 1994:139), it is possible to be at home or “make yourself at home”, as the expression says, in a wide variety of places from hotel rooms to workplaces. Moreover, it is possible for people to be home at several geographical places in a similar way as being able to love more the one of their children.

The home as a retreat from the world has changed to be a more transparent place. When we use mobile phones, computers with Internet connection and other similar devices, we connect our home to the world in a different way than earlier. Especially the Internet is opening the home to a two-way flow of information; however, the home is still a place for privacy and mundane living. Thus, the home has become a mixed zone with many openings to the world with the Internet as a “pulse” (Bell and Kaye, 2002:53) that empowers the inhabitants.

### *At work*

Workplaces have many forms and variations, and, historically, they have changed from one-person craftsman places over panoptic factory floors to modern-day office environments. However, there is not necessarily any contrast today between being at home and being at work. Obviously, some people work from home, at least some of the time, but also at designated workplaces workers can feel at home. Besides the truck driver on the highway, office employees can feel at home at their workstation, which traditionally is made homely using personal belongings like family pictures and artifacts that are meaningful to the worker. Other work environments encourage homeliness by creating a living room feel to the office.

A notorious example of a domestic-like workplace is the “Googleplex” in Mountain View, California, which is the world headquarters of Google, Inc. (cf. Google, 2007). This work environment includes a grand piano, bicycles, large rubber exercise balls on the floor, workout rooms with weights and rowing machines, locker rooms, washers and dryers, assorted video games, pool table and ping pong. Three or four workers share an office space “with couches and dogs” (Google, 2007), which underlines the company’s determination to create a continuum from work to home. In a workplace like this, the workforce is often considered to be like a family and it seems that the only things missing here are beds and children. Undoubtedly, this is very far from the bureaucratic, industrial workplace – almost the opposite of home – which has been satirized in the Terry Gilliam movie *Brazil* (1985)<sup>4</sup>.

Workers can be at home on the job which, of course, can lead to privacy issues known from domestic environments. Perhaps the most private of all rooms at work, the bathroom, has been the site of invading technologies, and under the headline “Big Brother in the Bathroom?” a newspaper article in 1997 said: “A new high-tech watchdog may soon monitor the personal hygiene habits of health care, food service and other workers every time they use the bathroom at work” (O’Harrow, 1997). The technology in question was the so-called “Hygiene Guard” – a persuasive device in the bathroom with the purpose of motivating users<sup>5</sup> to wash their hands each time they use the facility. The successful implementation of this technology would have a positive influence on health issues, but this is not the focus of attention. Since workplaces can be homely, workers rightfully consider their work life to have a privacy dimension, and therefore the seemingly “harmless” Hygiene Guard can provoke an Orwellian reaction similar to e.g. the idea of mandatory, state-controlled surveillance cameras in all homes – to push it to the extremes.

### **Being-in-the-house**

As the philosophically minded reader might have guessed, the title of this part is a reference to the term *In-der-Welt-sein* (“Being-in-the-World”), which is part of Heidegger’s effort to replace dichotomies like subject, object, consciousness and world. Being-in-the-world is simply an aspect of human existence, and Heidegger’s project is thus to reject the idea of subjectivity without a world, which – perhaps to some readers’ surprise – has been and still are a rather popular idea or thought experiment within some schools of academic philosophy. In short, the term being-in-the-world means that the human mind always incorporates a body that lives in a world. I acknowledge that the

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<sup>4</sup> This presentation might give the impression of a bias towards Google’s corporate culture, however, it is not my business in this context to confirm, deny or discuss such possible preferences. The interesting thing here is that Googleplex illustrates that a workplace can, indeed, be homely – regardless that the corporate homeliness might be motivated by a hidden agenda of getting employees to spend more hours working than the industrial work culture of “being on the clock”.

<sup>5</sup> This technology could apply to both home and work, but the target group for this particular device is employees at restaurants and hotels.

comparison is not complete, but there is a similar relation between people, homes and houses. As Heidegger puts it, people attain dwelling only by building (Heidegger, 1994:139), and being at home is similarly connected to inhabiting a certain geographical place.

As an inhabited place, houses can also be considered to be gendered spaces. Most notably the kitchen, of course, which traditionally has been designed to be a workplace for women, as the dated and rather politically incorrect proverb says: “a woman’s place is in the kitchen”. Therefore, designing houses is not just putting a roof over the heads of a family, it can be an ideological practice where e.g. gender values can be either reproduced or challenged. Similarly, the architecture of workplaces can be seen as representing a certain work ideology. The panoptic space of the industrial factory represented a hierarchical structure of disciplinary procedures while a modern-day office environment, e.g. the Googleplex, represents a different work ideology or corporate culture. Besides the architecture, the technologies introduced in homes and workplaces’ carry with them a number of broader changes. In the 1980’s, when PC’s were broadly introduced, this could initially be interpreted as an extension of the workplace to the home. Of course, this has changed with the much broader use of computers today.

Despite the connection between people, homes and houses, the house of the future has, surprisingly, often been envisioned without inhabitants. The focus on efficiency and rationalization of house procedures seems in many cases to have left out considerations about that houses are people’s home and workplace. Especially, the intelligent house: “The smart-home movement of the last decade has proceeded with only the vaguest reference to users and occupants. And one might argue, in their attempts to create technological solutions for the home, engineers have forgotten that these homes have occupants at all” (Bell and Kaye, 2002:50).

## HOUSE 2.0: THE INTELLIGENT LIVING AND WORKING ENVIRONMENTS

This chapter focuses on future housing as imagined today with regards to surveillance and ethics. Firstly, I discuss surveillance studies in relation to home and workplace. Secondly, characteristics of the house of the future will be discussed. Thirdly, I discuss ethical architecture and design.

### Surveillance in the house

Surveillance studies has grown to be a cross-disciplinary field of research. In the following I will focus on some of the current trends of this field followed by a discussion of surveillance in connection with living and working environments.

#### *Beyond the Panopticon*

Jeremy Bentham’s infamous sketches of the Panopticon begins: “Morals reformed – health preserved – industry invigorated instruction diffused – public burthens lightened – Economy seated, as it were, upon a rock – the gordian knot of the Poor-Laws are not cut, but untied – all by a simple idea in Architecture!” (Bentham and Bozovic, 1995:29). This “simple idea” has been very influential for modern-day surveillance studies both concretely and metaphorically. Although the Panopticon was more or less disregarded (Lyon, 1991) after Bentham until Michel Foucault’s *Surveiller et punir: naissance de la prison* (“Discipline and Punish: The Birth of the Prison”) from 1975, apart from a few notable exceptions (e.g. Himmelfarb, 1968), it has since been resurrected as a dominating conceptual framework within surveillance studies. Interestingly, students of surveillance have often tried to go beyond the Panopticon, and a number of new concepts have been introduced, e.g. “the electronic Panopticon” (Lyon, 1994) and “the superpanopticon” (Poster, 1996). However, writing and talking about going beyond the Panopticon (rather than actually doing it) still seems to be a strong discourse, as indicated by the title of a recent book edited by David Lyon with contributions from leading scholars within surveillance studies: *Theorizing Surveillance: The Panopticon and Beyond* (2006). In the book, Lyon laconically states that “[t]he panopticon refuses to go away” (Lyon, 2006:4).

A focal point of surveillance studies has, of course, been surveillance technologies. At first, the primary focus on technologies had to do with dataveillance, i.e. the computerization of surveillance, which has grown since the 1960’s. Dataveillance gives rise to a number of concerns relating to massive generation and processing of (personal) information and, therefore, such issues are still important to deal with, since computers of today are more powerful than ever. In the last decades, as surveillance studies has grown rapidly, many new surveillance-capable technologies have been

introduced and, equally important, computing has changed, which has given rise to new types of issues.

Many of these important issues have to do with technology and computing becoming mobile, intelligent and pervasive. The consequences are that surveillance is no longer fixed to certain places. Moreover, when technologies become intelligent, i.e. they are more adaptive to the environment and human behavior. Further, computing has been – or is about to be – embedded into everyday appliances, and all these changes create new surveillance potentials at home and at work. In a general sense, these developments contribute to the breaking down of the dichotomy between public the private and the public. In other words, private life and work life seem to be blending, and in order to assist at home and at work, the intelligent technologies and pervasive computing contribute to the massive amounts of generated information. However, it is also important to acknowledge that as surveillance studies has grown to be a broader field of research, the positive and caring aspects have come into consideration as well – notably, Lyon (2001) has described surveillance as Janus faced, spanning from control to care. Furthermore, it has been suggested that surveillance studies should embrace the contexts of entertainment, play and leisure, and in this way, surveillance is studied as a social practice. In this approach, the object of study is as much the subjectivity of surveillance (which in this case would be the inhabitants and the employees) as the effects of surveillance (Albrechtslund and Dubbeld, 2005, Albrechtslund, 2007b).

### *Home and workplace surveillance*

As mentioned in the above (“What is a house?”), a number of new devices and especially the Internet have contributed to the development of the home from retreat to a semi-transparent place. The “opening” of the home, created by information-generating technologies and the Internet connection, has brought about new surveillance issues.

David Lyon has introduced the concept of “leaky containers” (2001:37-48) to describe how data move freely between different sectors in today’s society. Before the heavy computerization that we have today, the “containers” did not leak in the same degree. Information about people from specific contexts (e.g. sports club, school, shopping, work, etc.) did not mix; rather the information was contained within that particular area of activity. With today’s technology, those containers have become leaky, and information from one context can more often appear in other contexts. For example, an Internet search for information about someone’s office details at work will probably generate information about the specific person’s work life as well as private and social life. Furthermore, the different sectors, now computerized, generate much more information than before. Lyon argues rightly that the mixing of information is of great importance to the commercial industry in their effort to profile consumers.

The idea of leaky containers also seems to be appropriate in the context of home and workplace surveillance. Today, the home itself – as a geographical place – could be considered a leaky container, since the information-generating technologies and the Internet connections has perforated the walls of a modern-day house. Furthermore, the different sectors within the house have begun to mix – both internally and when new sectors are brought to house – in the way described by Lyon, so there seems to be leaky containers within leaky containers. Many homes today are sites for all kinds of activities that formerly did not take place within a household, as a lot of people are working from home, at least some days, and the Internet as well as television facilitates extensive shopping and social life. In this way, new practices of surveillance have an element of entertainment, empowerment and social interaction that goes beyond the household.

The workplace has similarly changed in accordance with technology and computing becoming mobile, intelligent and pervasive. The panoptic factory with its hierarchy of managers systematically watching workers like a clockwork, as parodied in Charlie Chaplin’s *Modern Times* (1936), simply is no more. Today, most workplaces do not operate like clockworks, as many employees have flexible working hours, some work on individual or collaborative projects, and the work can take place on many locations. The consequence of this is a changed pattern of surveillance – beyond the Panopticon. Instead of establishing a disciplinary space, the surveillance of workers takes place in a more hidden way, e.g. by monitoring e-mails and Internet traffic. On the road, truck drivers are electronically monitored, revealing such information as travel routes and speed (Lyon, 2001:40). All this information is in “leaky containers” as well, and in the context of work this means that information gathered for one purpose might turn up in other situations. The notorious example is closed-circuit television in shops and supermarkets, which are there to prevent customer theft, but the cameras can certainly also be used to evaluate the employees. On the other hand, sur-

veillance technologies and practices in the workplace can also be enabling for employees as a way to take control of the work life.

### **House of the future**

Returning to the idea of the house of the future, the current trend seems to be that houses and technologies are designed with adaptability in mind (cf. Pilich, 2004), hence the discourse of “smart” and “intelligent” houses. Whether the implementation of intelligent systems is done independently from other systems or if everything is coordinated in a central computer with specific software, buildings and technologies need to store data in a database for later query. The spatial character of any building and living environment coupled with the need for coordination with the everyday routines of its inhabitants make the database work like an image of the activities within the building. And this is, of course, the main worrying issue relating to surveillance and ethics of future housing.

Our houses are about to change from having computers as distinct objects (e.g. desktops, laptops and PDA's) to the integration of computers into the background. Examples of this kind of “everyware” (Greenfield, 2004) at home include the intelligent refrigerator that automatically generates a shopping list based on its current content (or lack of content) and the preferences of the inhabitants; the intelligent vacuum cleaner that automatically cleans the house at convenient hours of the day; the intelligent heating and lighting system that automatically keeps the room temperature comfortable based on the inhabitants use patterns of the different parts of the house and which turns the light on and off as people are present in certain rooms. In the context of work, we see similar changes, as the workplace comes to resemble the home more than e.g. the panoptic factory. Here, intelligent technologies also learn and adapt to the patterns of the workers.

These examples have an air of science fiction to them, and developers of technology for intelligent buildings can undoubtedly find inspiration in popular culture. Since the early twentieth century, comic books and television (as mentioned) have enthusiastically explored the possibilities of intelligent technology at home and at work. Furthermore, the very same imaginative ideas have been the subject of satire within popular culture, e.g. Jacques Tati's Academy Award-winning movie *Mon Oncle* (1958) that portrays the automated house as impersonal and, to some extent, unintentionally comical. However, the intelligent building is not only science fiction, since a number of adaptive technologies already today have been embedded in homes and workplaces, just as many others are apparently in development.

However, an important change in thinking about future housing seems to be that today, intelligent houses are often designed for people with special needs, e.g. disabled and/or elderly (e.g. Vandebosch et al., 2005, Cucchiara et al., 2003). Instead of houses like *The Jetsons*', we are seeing the intelligent houses being designed for especially health monitoring and other medical purposes in collaboration with medical staff. Yet, “the robots are coming”, as a famous saying goes, and many developments suggest that the near-future will make the saying come true. First of all, the tendency of mobile, intelligent and pervasive technology seems to be strong and already at an advanced level, so a futuristic, adaptive house is not any longer just a fantasy, but a real potential for architects and designers. Secondly, the history of technology shows numerous examples of technologies, e.g. the television and the telephone, that were originally designed for people with special needs, but now has become mainstream technologies. An obvious observation would be that intelligent houses, designed for people with special needs, would find use in a wide variety of contexts. For example, it seems that health monitoring, cleaning robots and similar technologies could be relevant and attractive for most people.

### **Ethical architecture and design**

The subject of architecture has rarely been discussed within the ethical tradition, but the subject of ethics has certainly come up in the academic literature about architecture (e.g. Harries, 1997, Specter, 2001, Wasserman et al., 2000). Here, architecture is thought of as the building of concrete surroundings and frameworks for human action: “[A]rchitecture is about shaping our physical habitat to suit human purposes, and in doing so also has the capacity to fulfill spiritual and emotional needs. [...] [A]rchitecture embodies the values of society that gives rise to it, but there is also clearly an acknowledged duty towards the future: that aspirations can be realized through works of architecture” (Wasserman et al., 2000:14).

The ethical architecture, in the sense of “building” context for ethical actions, is related to the idea of ethical design, as I have discussed elsewhere (cf. Albrechtslund, 2007a). The basic argument is



that designing technology is also shaping a framework for ethical action. From a phenomenological perspective, as argued by Don Ihde (cf. Ihde, 1990, Ihde, 2002), the relations between humans and technologies are “multistable”, since technologies embody potentials that empower human action, which combine in manifold ways. Thus, multistability refers to the ambiguous character of human-technology relations, and both humans and technologies are constituted in these relations. When we design technologies, the process is similar to the building of houses, as technology facilitates the framework and range for ethical action in much the same way as houses embody societal values and facilitates a physical space for action. In this way, architecture and design become important topics for the ethics and surveillance issues connected to the house of the future.

Ethical architecture and design is more about looking ahead than looking back, in that building and designing are ethically preemptive rather than evaluating. The interesting question is, of course, how to proceed with architecture and design in order to create an optimal environment for ethical action. In *Designing technology for domestic spaces* (Bell and Kaye, 2002), the authors offer a manifesto for architects and designers based on a historical study of futuristic thinking about houses. They find that designers of houses for the future, especially in the last decades of intelligent houses, have been too much occupied with the functionality and technological possibilities rather than on actual domestic life. Thus, the basic argument of the manifesto is to think domestically, not technologically, and this change corresponds to a change in focus from the house itself to the home or workplace. In terms of design, it is a change from non-user-centered design to user-centered design (Bell and Kaye, 2002:58-60).

## CONCLUSION

After studying house, home and workplace and discussing surveillance as well as ethical architecture and design, it should now be possible to give an informed response to my initial research questions.

My first question had to do with the flow of information in a technologically-enhanced house. There can be no doubt that the amount of information is rapidly growing and it is flowing in new ways, as the house – home and workplace – undergoes a similar transformation of information infrastructure as elsewhere. The consequence is a change of the home from retreat to a more transparent place, and of the workplace from disciplinary, “clockwork”-like to more flexible procedures.

The second question addressed the surveillance potentials at home and at work. The consequences of growing amounts of information that flows in new ways is well explained with David Lyons concept of “leaky containers”. The panoptic structure of surveillance does not (any longer) seem to apply to the home or the workplace, as the monitoring of everyday life and work life has changed in accordance with the mobility, intelligence and pervasiveness of today’s technology and computing. Therefore, the surveillance potentials have both changed and grown. Besides being a tool for monitoring consumer, citizen and work behavior, surveillance has become an opportunity for entertainment and social interaction at home. At work, surveillance now also empowers employees to flexibility and work collaboration.

My third question had to do with the possible ethical consequences of a technologically-enhanced house. As houses are the geographical place for human habitation and ethical action, architecture is in a concrete sense the building of a framework for such actions. Similarly, designing domestic and workplace technologies ought to be a process of anticipating and preparing for ethical situations. Therefore, architecture and designing are ethical practices, which imply a responsibility for architects and designers.

The futuristic, technologically-enhanced house, or “House 2.0”, as I have called it in this context seems to be just around the corner. Not in the sense of *The Jetsons* as home or *Star Trek* as workplace, but as an adaptive environment that have the potentials to empower people at home and at work. For that reason, it seems important to focus on the inhabitants of the home and the employees at work rather than solely on architectural and technological possibilities. A user-centered design approach makes it possible to not just think of future homes and workplaces as they are today (or yesterday) *plus* time saving technologies. House 2.0 should not just be a projection of today’s houses with extra technology, but a place that facilitates new and better ways for life, work and ethical action.

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