

Discourse Analysis on ICT and Home
- From Electronic Cottage to Sharable Home -

정보통신기술과 주거에 대한 중요 담론 분석연구

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Abstract

This paper draws the home into the stream of information and communications technology (ICT) development. Considering that homes and our home life are constantly affected by persistent change influenced by ICT, it is remarkable that ICT has been relatively neglected as an object of research in the field of housing studies. This study provides an overview of conceptual movements in ICT/home relationships and their design and social impact through a critical discourse analysis. The conceptual movements must be considered by professionals in the field of housing and built environment to stay attuned to changes in the 21st Century. Diverse debates took place in the discourse about ICT in relation to home. The stream of thought was started by futurists who saw the electronic cottage as a solution to the social problems caused by the separation of work and home life in industrial cities. ICT has now entered a new phase, with WiFi P2P networks and location-based social media that encourage sharable homes. Based on the analysis of the discourse on ICT and home, we drew from three issues related to the paradigm shifts in homes in the context of ICT development to provide future directions for housing studies: from space programming to time scheduling, from individual ownership to shared access, and from live+work dwelling to live+work+community.

Keywords : ICT, Home, Discourse, Designer, Smart Home, Sharable Home

주요어 : 정보통신기술, 주거, 담론, 디자이너, 스마트 주거, 공유주거

1. Introduction

Work and home life, which had been separated in the industrial age, have become integrated once more in the digital age because technologies provide us with ways of working at home again. The most radical change in the digital age is a focus on the home, which has fostered the emergence of a new home-centered society where dwelling, work, and leisure are entirely facilitated by information and communications technology (ICT) with the concepts of 'live/work dwelling' (Mitchell 1999) and the 'smart home' (Harper 2003). The term ICT first reached the general public in 1997 in a report by Dennis Stevenson to the British Government. Prior to

this, the term 'telematics' was used to refer to the integrated use of telecommunications and informatics, defined as "those applications of computer techniques and information engineering for which the bridging of significant physical - and any related organizational and cultural - distances by network connectivity is an essential feature" (Arnbak 1990). In general, research on smart homes has been thoroughly undertaken in order to introduce smart technologies and devices for residents' home life. It is a promising field that was initially developed for home automation and networking technologies that connected electrical appliances and services for remote control. However, this research pays more attention to conceptual movement affected by ICT in smart homes. Moreover, the latest location-based technology and peer-to-peer digital platforms create the possibility of a new way of living through home sharing, parking lot sharing and so forth, emphasizing the concept 'sharable home'. The home and our home life are constantly affected by persistent change influenced by ICT. However, theoretical studies have not kept up with these changes. Additionally, many professionals seem to be out of touch with the

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realities and assume that the ICT impact is to be considered irrelevant in the field of housing environment, and limit their role to the physical space of the houses, not considering the ICT context sufficiently. The lack of research that links ICT with the development of the home limits the thinking by housing professionals. In order to address this lack, this research aims to analyze the changes in home and home life that have taken place on the back of ICT, drawing in home design and the social impact effected by the ICT. By going into the changes in great depth, this research suggests roles of professionals in the field of housing and built environment to stay attuned to the changes in the 21st Century. This research has significance in providing a critical analysis of the discourse on ICT and home that could be a basis for the theoretical background of the research on homes in the digital age.

2. Research Scope and Methods

In this paper, we employed a critical discourse analysis (CDA) that has been applied in a variety of social science studies including sociology, anthropology, communication studies and cultural studies. It has been proved as a useful method for drawing critical thought to social situations and providing new perspective, insight and knowledge based on continuous debate and argumentation (Keller 2012).

Because the CDA depends on the interpretations and logic of the researcher's arguments, the reliability and the validity of research findings remain a matter of the coherence of discourses and the fruitfulness of the analysis (Jorgensen and J. Phillips 2002).

<Figure 1> illustrates how this research was conducted using the CDA method. We first clarified criteria to extract discourses; next, we grasped the concepts and focal points that explain conceptual and functional changes in homes supported by ICT drawing their design and social impact from the discourse. Finally, we established a conceptual movement from the early discourse to the recent discourse in the home and ICT relationship. Discourses we studied include scholars' literature, articles, dissertations, policy notes and conference papers. These can largely be categorized as early discourse and recent discourse according to the stage of ICT applied at home. This tends to be somewhat coherent to the publication year of discourses before and after 2000, but because some early discourses anticipate future ICT and some recent discourses relate to the early stage of ICT, we primarily stay focused on the stage of ICT development discourses dealt with, rather than publication year <Figure 1>. Additionally, we concentrate more on conceptual changes by discourse analysis rather than daily changes, which require further research based on a long-term observational follow-up study using a micro-scale approach.

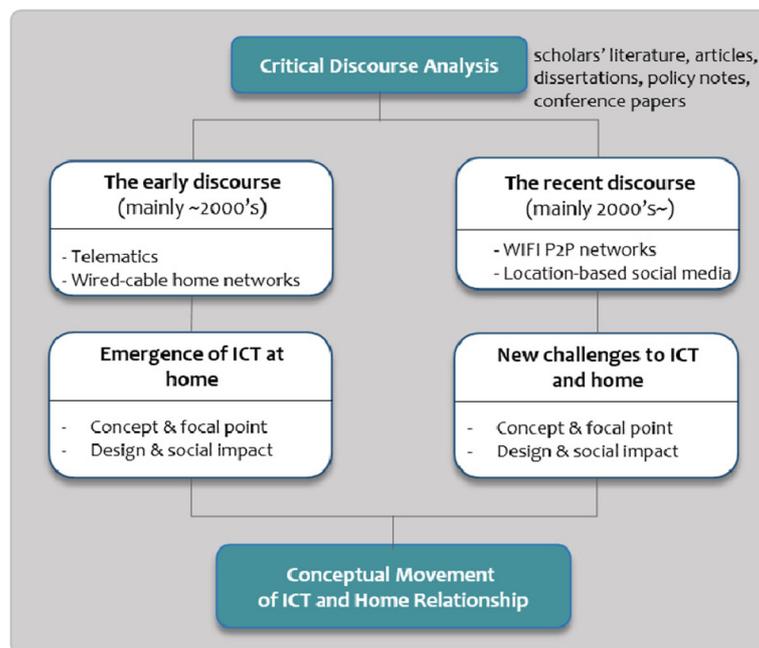


Figure 1. Research procedure adopting the CDA method

3. Emergence of ICT at Home - Electronic Cottage to Smart Home

The thinking of the relationship between ICT and the home originated in the West, in circles of futurists who indulged in somewhat utopian speculations. The most innovative futuristic analysis of relationships between telematics and the home was referred to by Alvin Toffler, in his book *The Third Wave* (1980), as a powerful concept of the ‘electronic cottage’ - a household that is the center of employment, production, leisure, and consumption, based on telematics. He believed that home-centered life in the electronic cottage would address many of the social problems caused by the separation of work and home life in industrial cities, including commuter traffic jams, air pollution, and extreme density within the cities.

Following Toffler’s groundbreaking concept of the ‘electronic cottage’, are Mitchell’s ideas of a ‘recombinant home’ (1995) and ‘live/work dwelling’ (1999), and Harper’s concept of the ‘smart home’ (2003) where a wired-cable home network infrastructure supports all houses with high-speed Internet and home automation digital appliances. These new concepts share a great significance in the field of housing environment from two perspectives: an expansion of home activities, and a locational freedom of houses. First, the home becomes a center of urban activities that cannot be performed in traditional homes as it integrates new functions and services based on wired-cable home network infrastructure. The dominant activity supported by electronically equipped homes is ‘telework’. According to Castells (1996), the most general hypothesis regarding the impact of ICT on the home, developed in the early stages of ICT development, was the radical increase in numbers of teleworkers. To support a convenient live/work life, house design started to focus on the intelligence of home appliances, and display appliances in particular. Many studies examine the possibility of ordinary home appliances, such as tables and TVs, and even architectural elements such as walls and windows, incorporating a smart display. For example, Microsoft explored environmental setting called EasyLiving that responds to residents’ voices and gestures (Steve Shafer 1998), The Georgia Institute of Technology developed Aware Home that provides automated services for the elderly (Cory D. Kidd 1999), and MIT built a real living environment for the House-n project to observe and study residents’ patterns with new technologies and home environments

(Larson 2000). Mitchell (1995) compared the role of display appliances in the recombinant home to the role of the fireplace in a traditional living room, stating that “just as the fireplace was the focus of a traditional living room, [...] so the display - the source of data, news, and entertainment - now bids to become the most powerful organizer of domestic spaces and activities”. Moreover, in order to avoid a conflict between the home as a place of activity and the home as a place of rest, a clear separation between working space and living space in the smart home was required through space programming (Caso 1999, Mitchell 1999).

Another significant factor of the live/work dwelling and the smart home is their locational freedom. Since electronically equipped homes can be located anywhere, some studies expand those concepts to “neighborhood co-workplaces” in Canada (Johnson 2003), “suburban satellite offices” and “resort offices” in Japan (Gann 1991), and “smart work centers” in Korea (Ministry of Security and Public Administration 2012), where the local neighborhood, suburban, and overseas-based centers support collective telework. They claim that we no longer have to sacrifice the desired quality of our home to get closer to our workplaces located in a crowded downtown area. Rather, these flexible live/work spatial patterns open up new possibilities for spreading home and work spaces over a wider area, expanding out into suburbs and multi-centers <Figure 2>.

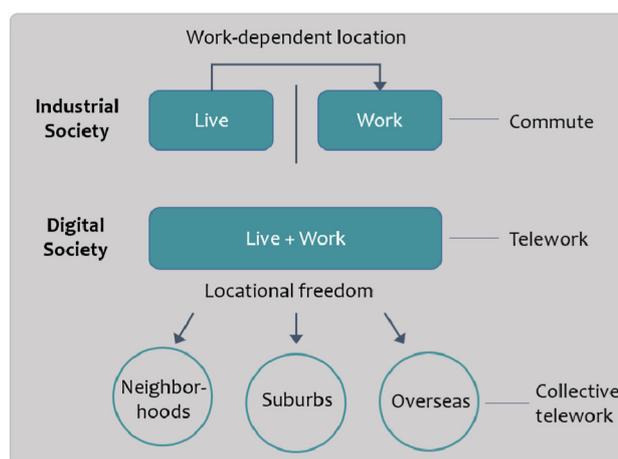


Figure 2. Live/work Spatial Pattern

While two important changes brought about a positive design impact in the way they lead to productive research performance in intelligent home appliances and flexible live/work spatial patterns, their social impact, drawn from several discourses on wired-cable home networks

Table 1. *Emergence of ICT at Home*

ICT	Telematics	Wired-cable home networks
Concepts of Home	Electronic cottage (Toffler, 1980)	Recombinant home (Mitchell, 1995) Live/work dwelling (Mitchell, 1999) Smart home (Harper, 2003)
Focal Point	Utopian speculations as a center of urban activities by futurists	Expansion of home activities Locational freedom of houses
Design Impact	None	Intelligent home appliances Space programming Flexible live/work spatial patterns
Social Impact	Solutions to many of the social problems in the industrial cities	Crisis of local communities

and the home, is regarding to a crisis of local communities. Traditional wired-cable home networks that connect home to home in certain residential communities were mainly confined to private home spaces. Thus, earlier discourses expressed concern about the smart home as that “luxurious gated condo (Mitchell 1999)” with residents barricaded in their isolated electronic forts, with privileged premium access communities for dominant users, which would generate a socially and spatially polarized urban system and become disconnected from their local communities (Castells 1996, Graham and Marvin 1996, Crang, Crang et al. 1999, Graham and Marvin 2001).

4. New Challenges to ICT and Home - Sharable Home

More recent discourses on ICT and home took a new turn with the wireless network, otherwise known as WiFi (Wireless Fidelity), location-based services and the diffusion of social media. Unlike traditional wired-cable home networks that are mainly confined to private homes, WiFi networks allow people to enjoy a variety of options, connecting online from anywhere; moreover, the values shared through online social networks are deeply connected to place-based activities. Reacting to this, discourses have moved their attention to co-living and sharable homes. The idea of a sharable home originated in Denmark around the 1960s, known as “cohousing”, and “collaborative housing” in the US (Vestbro and Horelli 2012). It typically consists of a private home with shared facilities such as a large kitchen, living room, dining room or office; its recent re-illumination is, however, caused by technological accessibility. Rachel and Roo Rogers in their book *What’s Mine Is Yours: The Rise of Collaborative Consumption* (2010), shed new light on the sharing system as a powerful trend driven by technology and peer community. Compared to the conventional sharing system, which focuses on the

sharing of facilities in a local context, collaborative consumption is a new lifestyle in the 21st Century where people share all kinds of tangible and intangible assets such as space, cars, skills and utilities, which is proving to be a compelling alternative to traditional forms of buying and ownership in the 20th Century hyper-consumption age. In collaborative lifestyles, people with similar needs or interests band together to share and exchange assets based on peer-to-peer (P2P) digital platforms, as people share rooms (for example, Airbnb and Roomorama), working spaces (on Citizen Space or Hub Culture), gardens (on SharedEarth or Landshare), or parking spots (on ParkatmyHouse). Based on this potentiality, several global cities, including Seoul, Amsterdam and San Francisco, adopted a sharable concept as their political strategies moving towards being a ‘sharing city’, with their common goal of creating cities as platforms for sharing by designing infrastructure, services, incentives, and regulations (Seoul 2012, Glind 2013, SHAREABLE and Center 2013). Compared to other sharing systems, including cars or utilities, home sharing is particularly significant in that a shared space naturally leads to shared activities such as using facilities or other supplies equipped in the space, thereby saving resources and energy. Moreover, location-based social media in mobile applications allows users to post questions and answers about specific locations, and to connect to providers or other users in safe transactions creating trust online; thus, people are participating easily in the process of collaborative consumption. The new types of sharable homes emphasize shared processes and collective activities among people through the network. In the sharing paradigm on the shoulders of advances in ICT, several policy notes focused on a discussion about design issues that foster home sharing and resident interaction: time scheduling, sharable design and small dwellings (SHAREABLE and Center 2013). First, rather than focusing on specific function or use of space,

allowing people to divide their time spent at home spaces; sharing the spaces during unused time is more desirable. Further, sharable design for shared activities such as laundry, meals, workspaces, and other communal events areas has become an important issue. Small dwellings are especially in the limelight because it becomes practical when clustered to enable shared space and amenities.

The sharable design approach mentioned above is being developed to solve barriers such as density restrictions, minimum lot and home size requirements, outmoded permits and fee structures, parking space requirements, other zoning barriers and so on. The outlook is highly optimistic that we will terminate isolation from the community and reinvigorate local communities that had been threatened in the early stages of ICT in the home. Botsman and Rogers (2010) claim that community is one of the four drivers of collaborative consumption together with P2P technologies, environmental concerns and cost consciousness. Similarly, in his survey conducted in Amsterdam, Glind (2013) found that the main intrinsic motives of the sharing economy are social, for example 'meeting people' or 'helping out'.

Table 2. *New Challenges to ICT and Home*

ICT	WIFI P2P networks Location-based social media
Concepts of Home	Sharable home
Focal Point	Shared activities Resources and energy savings Location-specific services
Design Impact	Time scheduling Sharable design Small dwelling
Social Impact	Resurgence of local community

Diverse debates took place in the discourse about ICT in relation to home. The stream of thought was started by futurists who saw the electronic cottage as a solution to the social problems caused by the separation of work and home life in industrial cities. Yet these utopian predictions were not based on a rational analysis of the home. Then from the mid-1990s, urban researchers renewed the discussion, taking a neutral attitude as they viewed smart homes, supported by wired-cable home networks, bringing about an expansion of home activities and a locational freedom for houses. However, they warned of the crisis for the local community caused by social isolation. Currently, ICT has entered a new phase, with WiFi P2P networks and location-based social media that encourage sharable homes. However, technical trends

tend to progress faster into our surroundings than theoretical studies, so although several cities have already adopted a sharing concept and have been seeking to implement strategies, scholar's theories have remained stagnant at the early stage of ICT. In this transition period, we attempted to draw conceptual movements in the ICT/home relationship, which must be considered by professionals in the field of housing and built environment in order to stay attuned to the changes in the 21st Century, as shown in the following table.

The results of the research raise three issues related to the paradigm shifts in homes in the context of ICT development: 'time scheduling', 'shared access' and 'live+work+community dwelling'.

5. Conclusion and Implications

The three conceptual issues are major factors to be considered by the professionals in the field of housing and built environment for the development of housing; thus, future research on homes in the 21st Century should proceed by considering these directions.

1. From space programming to time scheduling

With the advancement in ICT, rather than traditional space programming, which divides home spaces according to the specific purpose of use, time scheduling promotes increasing efficiency in our use of space, because people can divide their time in home spaces with flexibility and share the spaces effectively during unused time. This trend would be more desirable for our home life now and in the future.

2. From individual ownership to shared access

Traditionally, a home is considered as an asset for individual ownership. Especially in the smart home age, ownership of intelligent home appliances was an important measure of housing quality, but now people can benefit from shared access with reduced personal burden and cost. Consideration about how to share spaces efficiently is becoming more desirable because it could provide alternative ways of using our home to support our everyday life.

3. From live+work dwelling to live+work+community dwelling

Whereas the industrial revolution forced the separation of home and workplace, the ICT revolution is bringing them back together. Because electronically equipped live

Table 3. Conceptual Movements in the ICT and Home Relationship

	The early discourses: Emergence of ICT at home		The recent discourses: New challenge to ICT/home
ICT	Telematics	Wired-cable home networks	WIFI P2P networks Location-based social media
Concept of Home	Electronic cottage (Toffler, 1980)	Recombinant home (Mitchell, 1995) Live/work dwelling (Mitchell, 1999) Smart home (Harper, 2003)	Sharable home
Focal Points	Utopian speculations as a center of urban activities by futurists	Expansion of home activities Locational freedom of houses	Shared activities Resources and energy savings Location-specific services
Design Impact	none-	Space programming Intelligent home appliances Flexible live/work spatial patterns	Time scheduling Sharable design Small dwelling
Social Impact	Solutions to many of the social problems in the industrial cities	Crisis of local community	Resurgence of local community

+work dwellings tend to induce home-centered activities, several scholars have expressed concerns about home isolation and an antisocial life disconnected from the local community. However, the trend now is toward a live+work+community dwelling. People can form a community to share and exchange on a local and neighborhood level.

We cannot make a decision as to whether these shifts indicate success or failure in homes supported by ICT; however, we can now predict that it will depend on how designers deal with ICT as an important element of home and our built environment, and how they adopt additional functions in future homes. For a long time, designers have been attempting to achieve inclusive designs for the home that are accessible to everyone. If designers keep focusing on building ‘luxurious gated condos’ that are only attainable by people with high net worth, a fear of isolation and the dual society will endure. On the other hand, if designers reflect the new challenges presented by the shifts in ICT and the home, our home and social life will progress toward designers’ long-held aspirations.

REFERENCES

1. Ministry of Security and Public Administration (2012). *Future of work-Smart work*. Seoul: Ministry of Security and Public Administration.
2. Arnbak, J. C. (1990). Telematics-Aims and Characteristics of a New Technology. *Telematics Transportation and Spatial Development*. 1-20.
3. Botsman, R. and R. Rogers (2010). *What's mine is yours: the rise of collaborative consumption*. New York: Harper Business.
4. Caso, O. (1999). *The City, the Elderly and Telematics*. Ph.D. Delft University, Netherlands.

5. Castells, M. (1996). *The rise of the network society*. Malden, Mass: Blackwell Publishers.
6. Cory D. Kidd, R. O., Gregory D. Abowd, Christopher G. Atkeson, Irfan A. Essa, Blair MacIntyre, Elizabeth Mynatt, Thad E. Starner, Wendy Newstetter (1999). The Aware Home: A Living Laboratory for Ubiquitous Computing Research. *Cooperative Buildings. Integrating Information, Organizations, and Architecture Lecture Notes in Computer Science*. 191-198.
7. Crang, M. et al. (1999). *Virtual geographies: bodies, space, and relations*. London, New York: Routledge.
8. Gann, D. (1991). Buildings for the Japanese information economy: Neighborhood and resort offices. *FUTURES*. 23(5), 469-481.
9. Glind, P. v. d. (2013). The consumer potential of Collaborative Consumption. *Sustainable Development-Environmental Governance*. MSc, Utrecht University, Netherlands.
10. Graham, S. and S. Marvin (1996). *Telecommunications and the city: electronic spaces, urban places*. London, New York: Routledge.
11. Graham, S. and S. Marvin (2001). *Splintering urbanism: networked infrastructures, technological mobilities and the urban condition*. London, New York: Routledge.
12. Harper, R. (2003). *Inside the Smart Home*. London: Springer.
13. Johnson, L. C. (2003). *The co-workplace: teleworking in the neighbourhood*. Vancouver: UBC Press.
14. Jorgensen, M. and L. J. Phillips (2002). *Discourse Analysis as Theory and Method*. London: SAGE.
15. Keller, R. (2012). *Doing discourse research: an introduction for social scientists*. London: SAGE.
16. Larson, K. (2000). The Home of the Future. *Architecture and Urbanism-Tokyo- 10*. ISSU 361
17. Mitchell, W. J. (1995). *City of bits: space, place, and the infobahn*. Cambridge, Mass.: MIT Press.
18. Mitchell, W. J. (1999). *E-topia: Urban life, Jim--but not as we know it*. Cambridge, MA.: MIT Press.
19. Seoul Innovation (2012). *Sharing City Seoul Plan*. Seoul: Seoul Metropolitan Government
20. SHAREABLE and S. E. L. Center (2013). *Policies for shareable cities*. USA: Sustainable Economies Law Center

21. Steve Shafer, J. K., Barry Brumitt, Brian Meyers, Mary Czerwinski, Daniel Robbins (1998). The New EasyLiving Project at Microsoft Research. *Joint DARPA/NIST Smart Spaces Workshop*. Gaithersburg, Maryland.
22. Toffler, A. (1980). *The third wave*. New York: Morrow.
23. Vestbro, D. U. and L. Horelli (2012). Design for Gender Equality: The History of Co-Housing Ideas and Realities. *Built Environment* , 38(3), 315-335.
24. Airbnb: www.airbnb.com
25. Roomorama: www.roomorama.com
26. CitizenSpace: citizenspace.us
27. HubCulture: www.hubculture.com
28. SharedEarth: sharedearth.com
29. Landshare: www.landshare.net
30. ParkatmyHouse: www.parkatmyhouse.com

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