STORIADELMONDO

Periodico telematico di Storia e Scienze Umane
http://www.storiadelmondo.com
Numero 86 (2018)

per le edizioni

DRENGO

Drengo Srl
Editoria, Formazione, ICT
per la Storia e le Scienze Umane
http://www.drengo.it/

in collaborazione con

Medioevo Italiano Project

Associazione Medioevo Italiano
http://www.medioevoitaliano.it/

Sisaem

Società Internazionale per lo Studio dell'Adriatico nell'Età Medievale
http://www.sisaem.it/

Melissa Sessa
The social dimension of the smart home. How sustainability became part of the domestic environment

Abstract

La diffusione dell'ideale tecnologico all'interno delle società ha fatto sì che si iniziasse a parlare già dagli anni Settanta del Novecento di *smart home.* Con l'avvento della terza rivoluzione industriale la concezione della casa è andata via via sbiadendo il suo ruolo di centro della comunicazione familiare, per acquistarne uno più ampio di comunicazione con il mondo circostante. Quali sono le caratteristiche che definiscono una smart home? Che tipo di soggetto sarà in grado di abitarla? Ci si trova davanti ad un nuovo tipo di società che riconosce all'abitante domestico un ruolo di primaria importanza come consumatore consapevole del proprio consumo. Quale sarà dunque il ruolo del consumatore all'interno del sistema energetico? Si farà soggetto attivo aggiustando i propri consumi, o rimarrà soggetto passivo? E, qualora sposi la causa smart, l'azione individuale avrà un riflesso collettivo? Il presente articolo mira ad individuare le potenzialità della smart home in termini di sostenibilità e di adattamento, concentrandosi sul ruolo che il soggetto agente ha nella comunità, e sulle novità che questo tipo di società, mutata con l'avvento delle nuove tecnologie, avrà da offrire.

Introduction

The house has always been studied[1] as a center of the spatial orientation, to say: scholars tried to understand where the man was, and which was his position in the social of the social hierarchy. The result of this study was a double nature one: on the one hand a physical reality and tangible reality called "house"; a structure of relations, a way of being or feeling, called "home"[2] on the other. "In other words, house is the base leading to the development of a home experience"[3]. Home is a shelter from the feeling of anguish rising from the perception of insecurity given by the outside world. The house forges the personality of the subject cohabitating with himself, but also with the outside world. Therefore, home is not an "external event, it rather shows off to people's original dimension, in their growth as rational beings". [4]

Understanding such a wide phenomenon is hard, as it ranges from economy to that invests engineering, architecture, and last but not least sociology; it corresponds to the refinement of the meaning to be attributed to the English words "smart home", alternatively to the Italian

---

[1] See also G. AMENDOLA, *Uomini e case. I presupposti sociologici della progettazione*, Edizioni Dedalo, Bari 1984; E. CORIGLIANO, *L'avventura urbana*, FrancoAngeli, Milano 1988; R. GUTMAN, *People and Buildings*, Basic Book, New York 1972; R.K. MERTON, *The Social Psychology of Housing*, in W. DENNIS, *Current Trends in Social Psychology*, University of Pittsburgh Press, Pittsburgh 1948, pp. 163-217.

[2] A research titled "Home, House, Housing" took place in 1991 at the Department of Architecture of Berkeley University. One of the stages of research was a series of open interviews about the meaning of the word *home*. In the second part of the research people were asked what the word home meant to them, and to say how they thought it was possible to switch from home to house. Although the research did not lead to a systematisation of meanings, based on the most frequent answers home was a place to live in, the seat of the family, the place where to raise children, or to stay alone, or do what you could do in public.

[3] E. CORIGLIANO, *Tempo spazio identità. No place like home*, FrancoAngeli, Milano 1991, p. 23.

[4] G. JORDAN, *La casa vissuta. Percorsi e dinamiche dell'abitare*, Giuffrè, Milano 1997, p. 16.

word "domotics". "The term domotics is a Gallicism derived from domotique, which in turn was a neologism born from the word *domus* and incorporates the terms informatique and telematique"[5]. The term domotics embodies many meanings: it is not only the ultimate expression of technology, but is also the synonymous of a structured product and thought to sustain environment. Even a third and last meaning can be given to domotics, assuming it was born from the need to control environment in relation to the presence or absence of people. In early '80s., nowadays "smart home", was considered as the home of the future and depended on man. The same man who, aimed at reaching the ultimate limits last of the technological design, is increasingly depersonalizing his own invention and redesigning it so that it can work without any help from man.

From the third industrial revolution to information society

It is thanks to the third industrial revolution[6] that this new science of living, namely the smart home, found its own place and moved toward the modern conception defining it as a unique integrated system. The enormous progress developed in the form of IT revolution with the creation of hardware and software, as well as with the telematic revolution and the advent of the web, gave a strong impetus to innovation, which is the main engine of the home electronics. Automation processes, become increasingly sophisticated, provide the basis for the applications of building automation and domotics. With the transition to the information society, characterized by the enormous development of information technologies and electronic equipment, the new concept of universal design envisages not only environments but also products and services that are, in general, "exploitable" by the widest possible range of users. Starting from the Second World War, the conception of the house changed. Nowadays house is perfectly integrated with the new electric technologies, which are an integral and essential part of the housing system so that concept of "electric home" will fade to leave place to simple home. The evolution of the information society[7] toward "intelligent environments" where the intelligence associated to the computers is distributed in the objects we daily use, implies that people are no longer surrounded only by computers, but even by "Intelligent objects" with which we interact for many reasons.

The diffusion of the technological ideal and time within technological companies, led to the spread of a reference global mental based on the interpenetration of physical well-being joined to the architectural attraction. During '70s and '80s the foundations for an enormous progress in the field of household appliances that would lead to the current conceptions of "integrated system home" were laid, allowing us to move the line of reasoning from liberation of the time as primary resource, or entertainment as the basic principle of the idea of communication, to services, "in a unitary and integrated vision of the building and its components that deliver services which are no longer only passive, but interactive"[8].

---

[5] M. CAPOLLA, *Progettare la domotica. Criteri e tecniche per la progettazione della casa intelligente*, Maggioli Editore, Santarcangelo di Romagna 2011, p. 42.

[6] For a more adequate description, see: J. RIFKIN, *La terza Rivoluzione industriale. Come il "potere laterale" sta trasformando l'energia, l'economia e il mondo*, Mondadori, Milano 2011.

[7] See: M. CASTELLS, *The Rise of Network SOCIETY*, Vol. I, *the Information Age. Economy, Society and Culture*, Blackwell Publishing, Chinchester, West Sussex 2013.

[8] M. CAPOLLA, *quote*, p. 24.

The challenge smart home: efficiency and effectiveness

As "smart home" is fully functioning only if all the inside innovations can interact and coexist in a systemic and dynamic way, insofar as the term smart is emphasized in its meaning of human intelligence. This intelligence must be stimulated within a process that aims at inclusion, no doubt a key element to this new way of living home. At the center of the smart home challenge there is the construction of a new kind of common good, a great technological and intangible infrastructure, albeit in materiality, making dialogue between and objects possible by integrating information. Within the smart home context, there is above all the generation of the intellect and the production of inclusion in order to improve home routine, to optimize the daily living. *The objective is therefore to make the environment in which we live interactive and cooperative.* Efficient and effective in supporting the independent life, able to provide greater safety, simplicity and satisfaction in performing activities of daily living. "Inclusion means avoiding every form of discrimination and giving value to differences"[9]. The interpretation of living is in this case functionalist and pointed by utilitarian logic of consumption and efficiency.

The concept of efficiency is a crucial one when talking about smart home, as the home automation project must be able to increasingly ensure any service for which it is fitted. Efficiency is different from efficacy: the the first is based on a cost-benefit ratio, while the second focuses on objectives. Something efficient is not always effective as well. Thus, the smart home supports both principles when the objectives, either building standards or rather capacity inhabitant is supposed to reach, go hand in hand with the levelling of the product's costs on the benefits to the person, and in a broader vision of society. This is a new form of consumption which borders are increasingly blurred and is turning into communication and language. A smart person is one who, based on such parameters, realize the way you dress is not the only way of interacting into a modern consumption based company, you also use furniture and house itself. "The building of one's own house is an immersive experience, as it makes your existential "project" visible and understandable to others"[10]. In this way one cannot help noticing, just the way Gorz does, how much the concept of capitalism and the invested capital changed. Intangible capital, currently considered as human capital, knowledge capital or capital intelligence. "Knowledge consists of experiences and practices turned into intuitive evidences and habits, and intelligence covers the whole range of capacities ranging from judgment and discernment to openness, to the ability to assimilate new knowledge and to merge with knowledge"[11].

Thus, society can experience a different economic rationality, no longer relying on the criteria of efficiency subject to human development. The overcoming of this type of capitalism, marked by a purely material connotation, must be routed behind the overcoming of productivity. Man should be able to profit from production and not the other way round, stressing even more significantly on the clear difference that between producing and occurring, where the subject agent emancipates and becomes capital.

Is interconnection a new category of social inclusion?

Aimed at promoting the interconnection between different kinds of capital, we need to consider the problem of the elimination of architectural barriers, the quality and accessibility to people's

---

[9] I. BERETTA (curated by), *L'umanesimo della smart city. Inclusione, innovazione, formazione.* Pensa MultiMedia Editore, Lecce 2015, p. 62.
[10] E. CORIGLIANO, *quote*, p. 113.
[11] A. GORZ, *quote*, p. 11.

life spaces. We consider the way in which environment adjusts to the person and to all the aids to encourage the full social inclusion. A domotic design willing to turn user into a protagonist, to move the focal point of the attention from the structure to the person, is subject to the actual will by the user to be a full part of the design process. This however implies choices and economic and cultural availability not everyone can afford.

The key idea is that consumers play an active role in the energy system by adjusting their consumption. A litmus test to understand at what degree people are involved are the feedback technologies[12], whose more frequent explanation for use is connected to the information vacuum. This is an information asymmetry opposing the use of new technologies and the subjects that must use them. A report that reveals two different conclusions: the first is certainly the lack of information about own consumption by consumer. The average consumers do not generally consider the levels of their consumption; they just avoid "wasting". The second assumed is the phase following the information vacuum, i.e. when consumers are given explanations. The informed subjects would be supposed to respond to stimuli in an appropriate manner. That is why the first consideration about feedback technologies is how they turn energy from invisible into visible, both materially and consciously in such a way that the consumer, aware of the problem, realize what their own habits of consumption of energy are. Thanks to this relational factor, individual will be able to perceive their own importance even when they are within the Community. One must not think about a subject atomized by the rest of the group whose actions do not have an impact on the rest of the subjects, but rather about a single inside a group with needs and priorities. The importance of the individual in the community and for the community: if the entire community is not smart, the collective result will not be as smart, even if the subject is really smart.

Sustainability as a new way to consume low cost

In recent years the national policies have been concentrating on sustainable development, especially after highlighting the planetary degradation emerged from the Brundtland Report[13]: it is a survey that between 1983 and 1987 brought to light the conditions of water, air, soil, plants and animals in relation to human activities after industrial revolution. After the Revolution the principles of sustainability and development, stuffed into an economic logic oriented toward the decline of the entropy began to vanish. And here the thought of Serge Latouche[14] takes its route, Latouche theory of happy degrowth states that a new economy could be built by decreasing the standards of current wellness, indeed elevating them, through new behavioral and qualitative development models. Therefore an ideal behavior linked to

---

[12] Feedback technologies are those systems able to enable users notice changes perceive changes, either small or sudden, that their behavior cause, in this case, the smart home. The possibility of continuously monitoring, of recording and keeping record of all the events that occur within a home environment, has the advantage of facilitating an objectivity of evaluation may decline as evaluationless, namely the complete exclusion of a value judgment. In many cases the changes in behavior are so slow and gradual human eye cannot perceive them, therefore technologies that help seizing these differences are needed. For further information see: K. BUCHANAN, R. RUSSIAN, B. ANDERSON, *Feeding back about eco-feedback: How do consumers use and respond to energy monitors?*, in «Energy Policy», vol. 73, 2014, pp. 138-146.

[13] The report goes "The concept of sustainable leads to crucial objectives which are crucial to environmental and developmental policies, and in particular to the restart of economic growth; to a change in the quality of economic growth; to the meet of essential needs in terms of employment, food, energy, water and sanitation; to the redirection of economic and management risks; to considering, while making decisions, the environmental and economic aspects". COMMISSIONE MONDIALE PER L'AMBIENTE E LO SVILUPPO, *Il futuro di tutti noi*, Bompiani, Milano 1988, pp. 32-72. Brundtland Report is available on the link http://www.un-documents.net/our-common-future.pdf.

[14] See: S. LATOUCHE, *La scommessa della decrescita*, Feltrinelli, Torino 2011.

quality and detached from quality that becomes ephemeral and vacuous from the moment in which it replaces the logic of the market is needed.

In this case, the smart home would have to be considered in its meaning of "active house", to say "the home able to produce energy and what it needs, adjusting itself in function of the preservation of its own capabilities and consciousness of new living behaviors"[15]. The system must be constructed to provide a service which is continuous and almost immune to failures, but in light of the inability of a lifetime warranty, repairing it must either be easy or take a short time for operation to be restored. Its functioning must be continuous without requiring particular attention and, in case of failures, it must be able to circumvent the problem and provide the same service for which it is designed or a similar one, in the case of reduced operation and waiting to be fixed.

The traditional model of consumption based on the purchase process, use and disposal of goods, is thought to have reached its structural limit[16]. Thomas Friedman argues that the 2008 represented the breaking point when the company collided with the limit of sustainability. The solution seems to be inherent in the behavior of the human in the resilience of the consumer, who being aware of such criticality, due to the reaching of the structural limit has approached differently the economy. It progressively moved toward methods of alternative consumption more marked by logic of participation and sharing, rediscovering the social sense. The awareness of ecological problems requires a renewed consideration of human life in all its many aspects, beyond technical and impersonal drifts. The intelligent supportable house correlates the good practices in favor of the environment with the exercise of social responsibility. This is a new form of capitalism, as Gorz states in "Intangible"[17]; he moves his focus from capital material to human capital. The man, as a resource, is at the center of trade in the market.

"There is an ecological instance visible to the urban society, a desire to perceptible as part of an ecosystem"[18]. In the topicality of the environmental emergency, the spread of a culture of sustainability is embodied in the promotion, at both the personal and social level, of styles of thought and behavior tended to a savings as optimal management of natural resources, but also as a qualitative enhancement of human life for a present, toward a future. "Educational processes aimed at sustainability, promoted to orient the rising participatory need, have as their main aim the increase of the capacity of the Community to be survivable"[19].

Sustainability not only as green, but also as the scope of choices of low-cost, gaze also and especially to the availability of users. An essential characteristic of the domotic system must be low cost, thought as the installation of technologies that have affordable prices. This is to include the generality of users by giving them a wide choice of smart solutions. Please note that the word "Intelligent House" indicates a house provided with a system able to manage the present plants in a simple and automated way. Today, the cost of a building should also be measured by taking into consideration its entire life cycle. In addition to the effect of the house purchase value, the costs of management of the same, which sometimes exceed those of cost, must be taken into account.

---

[15] M. CAPOLLA, *quote*, p. 222.

[16] P. DEGLI ESPOSTI, *quote*, p. 68.

[17] See: A. GORZ, *L'immateriale, Conoscenza valore e capitale,* Bollati Boringhieri, Torino 2003.

[18] I. BERETTA (curated by), *quote*, p. 90.

[19] *Ivi*, p. 91.

Ideas for reflection: which house for what future?

Our idea of future is one where users of electricity are not only consumers but also producers of their consumption, also known as "prosumers"[20]. According to the same idea, automation is greatly increasing and where the use of renewable energies runs smoothly. These perspectives are linked to an idea of man that is actively engaged and economically motivated.

In light of the above, we can see that the connection between manufacturers of smart solutions and consumers is ambiguous. On the one hand the grid technologies are too complex for people who are not constantly in contact with these specificities, but on the other hand the user is considered as "man-resource", easy to involve in the new logics. A man easily influenced, albeit within the fashion of the moment, in these solutions. A man who, by rationalizing their own choices decide for the "good living" regardless of sex, age or social class. No doubt we must consider the attractiveness of the "new" as the main thrust toward the perception of the subject not only as a spectator, but also as an actor. A subject that has evolved from a simple consumer to producer, and even questioned this dichotomy to become "prosumer".

There is basically a slight antagonism between man and smart solutions, since man expects to take part more actively in the technological solutions, although sometimes not having the expertise to do so. The so called "flexible user"[21] is thus born; the latter is able to adapt to the situations offered by the social context. A type-user which has characteristics specular to the smart home. Such user will adopt the principle of resilience, understood as the capacity for adaptation, despite the adversities[22]. In the house internal, almost intimate environment, inhabitant is the one who gives life and soul. A smart individual is not the result of an insertion inside a house, smart itself, but the result of historical evolution. Stands in front of us now A broad range of compared generations more or less going towards a common border, also depending on their age, stands before us: such border is the integration of technology into routine, where everyone has the responsibility of everyone. An integration of intent leading to the perception the perception of a community of involved individuals rather than a single atomized individual, because the "smartness" of a city is given by people and not by the technologies that compose it. We would have to wonder if we should not argue about the role of the individual within the company in terms of production and therefore wonder if the recognition of this walk through the construction of a society based on knowledge and on the direct involvement of its members. "We are beings equipped with energy" Livio De Santoli writed "and this should lead us to reflect on the importance of the individual microcosm within the macrocosm of the energy, on the responsibility of each of us, on our role of producers which goes hand in hand with the historic one of consumers. We are realprosumer"[23].

The development of the Taylor system[24] of production has implemented, in its maximum evolution, the use of the technologies of automation. However, it should be noted that the

---

[20] The concept of the prosumer draws its historical origins from the work of McLuhan (M. McLUHAN, *Take today; the executive as a dropout*, Harcourt, San Diego 1972) that prophesied as thanks to the electric technology and at the arrival of the era of the dotcom, with an emphasis on the immediacy and the simultaneity, the superstructure tecno-productive western mold would become progressively obsolete and the consumer would be gradually turn into a producer

[21] See: T.M. SKJØLSVOLD, M. RYGHAUG, T. BERKER, *A traveler's guide to smart grids and the social sciences*, in «Energy Research & Social Science», vol. 9, 2015.

[22] Here it is necessary to distinguish between individual resilience and social resilience, which is not equivalent to the sum of the resiliencies of individual, but it is understood as the ability of a community to establish a network of capacity of adaptation following a collective event that upset the normal.

[23] L. DE SANTOLI, *La comunità dell'energia*, Quodlibet, Macerata 2011, p. 17.

[24] For more information see, among others: G. BONAZZI, *Storia del pensiero organizzativo*, FrancoAngeli, Milano 2008; D. NELSON, *Taylor e la rivoluzione manageriale. La nascita dello scientific management*, Einaudi, Torino 1988.

differences in economic terms which had instead faded on the social side emerged again as a consequence of global economic crisis. The quality of life represents topics deemed important both from a political point of view and from the point of social: the need to tackle common problems involving different contexts and sectors has acted as an incentive to promote the construction of a system with the aim of achieving a common program involving a collaboration both horizontal and vertical. To say a collaboration both between the different hierarchical levels at the same level, between institutions and public and private bodies, to tackle in synergy and minimize the impact that the current dynamics might have on the system of each country, even those more evolved and advanced. The introduction, obliged by international guidelines, technologies of solar thermal and photovoltaic solar for new buildings, "imposes additional fixed installations that will need to be monitored and adjusted to meet the requirements and performance imposed by law"[25]. The domotic system is good to improve life inside the home, but it should not be limited to the house itself. You must look at a general dimension that also includes the other houses in the neighborhood, possibly smart also in an optical interconnection that allows the communication of all systems.

Therefore, the collaboration between the three types of capital, economic, cultural and social capital, is oriented towards the resolution of the economic crisis rather than towards an intent of formal equality and substantial relations between individuals and society. And it is precisely the excessive use of this technology which has meant that the man was alienated with respect to its own "wesen", with respect to its essence.

Conclusions

At the end of this historic- descriptive study you might think that in the era of 3.0, the implement of the capacity of the smart house is the best thing one might expect. Instead there are critical challenges that this approach to the smart principles sharply reveals. Despite the positivity observed[26], the development of smart solutions has showed many criticities of the surface, which can be found in the difficulties to understand, and therefore in the implementation of the principles of smartness.

The first pathological flap resulting from smart knowledge is prosuming machine[27]. A characteristic deviating from the basic model, that of "smartness", which if led to its extreme consequences depersonalizes man. Merton would define it as a "perverse effect", according to which some rational premises in collective action (in this case the distribution of smart solutions) will ultimately generate opposites, unpredictable and apparently irrational. "The prosuming machine are the result of the interaction between technology and devices that are very familiar to the reader, who considered through the optics of the prosumerism, accentuate as in the past we have made a mistake in considering production and consumption in a unique perspective by treating them as separate phenomena rather than interconnected"[28].

A second flap pathological instead puts the emphasis on the new conception of the house. In a near future it would be appropriate to move away from the idea of an intelligent house as an exception to the normal. It would be appropriate to restore the essence of the term normally used. Just as during the Second World War home was not electric but simply a house, due this

---

[25] M. CAPOLLA, *quote*, p. 219.

[26] Referring to what we said above. The birth and the consequent development of smart home, have meant that the inside of the company began to come to light, with ever greater enthusiasm, the principles of efficiency and effectiveness, united to the discovery of sustainability as a value hinge of the new way of thinking about smart.

[27] See https://georgeritzer.wordpress.com/2014/03/23/the-rise-of-the-prosuming-machines/.

[28] P. DEGLI ESPOSTI, *quote*, p. 142.

to a normal electrical systems inside home, "the house that today we call intelligent will be the standard average installation in a few decades" [29]. What I mean is that the production of the domotic systems starts to assume a configuration suited to a home automation possible and not futuristic. Something that really is, and not just might be. In the routine of the creation of the smart home you begin to configure innovative standard, and no more news that make the perception of the house no longer possible but actually made.

The third and last pathological flap is found in the choices that present generations will have to face in order to guarantee future generations, a sustainable future. The new generations will be protagonists of the future, for which reason, with such a development of the house which becomes smart, sustainable, interconnected, effective and efficient we do not think about the present generation, the safeguarding of today, but also and above all about the protection of a future, not so much the next. If you return the reasoning in the economic sphere there is talk of choices aimed at long period, but that find their base and their solidity in occasions exploited and created in the short term.

The theme of the ecological approach[30] thus shows off as the safeguarding of the future, that deals with analysis of the relationship between individuals and the nature, observing how the chase of a specific individual interest, erode resources thus depriving future generations. Hardin *spoke of "tragedy of commons"*[31]. *The tragedy is that if a resource is collective, i.e. access to which is free, everyone can use it, each may abuse it, as there are no property rights. Therefore, not being regulated we shall speak of abuse of use, which would reset the collective interest, for the benefit of individual interests.*

We should focus more on utilitarian theories, on the result of the same that turns in the thought that it is desirable to the welfare of the individual, just as and to the extent that this interest is an integral part of a collective interest. And it is here that you should establish the tendency to seek a ratio between the shareholders and the city that hosts, since the "smartness" of a city is given by people rather than the technologies that compose it.

---

[29] M. CAPOLLA, *quote*, p. 57.

[30] The ecological approach has proposed a new way of conceptualising the relationship existing between the individual and the surrounding nature, claiming the behavior of an organism is mediated by the interaction behavior-environment. Also placing attention on what is degenerative the tendency to seek to change the ecosystem without first assessing the consequences. From this arises the objective of promoting behaviors aimed at the promotion of health, both in the environmental field that behavioral. For further information: U. BRONFEBRENNER, *Ecology of human development*, il Mulino, Bologna 2002.

[31] For a more adequate description refers to: G. HARDIN, *The Tragedy of Commons*, in «Science», vol. 162, pp. 1243-1248.

Bibliography

AMENDOLA G., *Uomini e case. I presupposti sociologici della progettazione architettonica*, Edizioni Dedalo, Bari 1984.

BAUMAN Z., *Modernità liquida*, Editori Laterza, Roma 2011.

BERETTA I. (a cura di), *L'umanesimo della smart city. Inclusione, innovazione, formazione*, Pensa MultiMedia Editore, Lecce 2015.

BONAZZI G., *Storia del pensiero organizzativo*, FrancoAngeli, Milano 2008.

BRONFEBRENNER U., *Ecologia dello sviluppo umano*, il Mulino, Bologna 2002.

BUCHANAN M., *L'atomo sociale. Il comportamento umano e le leggi della fisica*, Mondadori, Milano 2008.

BUCHANAN K., RUSSO R., ANDERSON B., *Feeding back about eco-feedback: How do consumers use and respond to energy monitors*, in «Energy Policy», vol. 73, 2014.

CAPOLLA M., *Progettare la domotica. Criteri e tecniche per la progettazione della casa intelligente*, Maggioli Editore, Santarcangelo di Romagna 2011.

CASTELLS M., *The Rise of Network Society*, vol. I, *The Information Age. Economy, Society and Culture*, Blackwell Publishing, Chinchester, West Sussex 2013.

COMMISSIONE MONDIALE PER L'AMBIENTE E LO SVILUPPO, *Il futuro di tutti noi*, Bompiani, Milano 1988.

CORIGLIANO E., *L'avventura urbana*, Franco Angeli, Milano, 1988;

CORIGLIANO E., *Tempo spazio identità. No place like home*, FrancoAngeli, Milano 1991.

DEGLI ESPOSTI P., *Essere prosumer nella società digitale. Produzione e consumo tra atomi e bit*, FrancoAngeli, Milano 2015.

DE SANTOLI L., *Le comunità dell'energia*, Quodlibet, Macerata 2011.

FABRIS G., *Il nuovo consumatore: verso il postmoderno*, FrancoAngeli, Milano 2013.

GIDDENS A., *La politica del cambiamento climatico*, il Saggiatore, Milano 2013.

GIORDANO G., *La casa vissuta. Percorsi e dinamiche dell'abitare*, Giuffrè, Milano 1997.

GORZ A., *L'immateriale, conoscenza valore e capitale*, Bollati Boringhieri, Torino 2003.

GUTMAN R., *People and Buildings*, Basic Book, New York 1972.

HARDIN G., *The Tragedy of Commons*, in «Science», vol. 162, 1968.

LATOUCHE S., *La scommessa della decrescita*, Feltrinelli, Torino 2011.

MARCUSE H., *L'uomo a una dimensione*, Piccola Biblioteca Einaudi, Milano 1999.

MCLUHAN M., *Take today; the executive as a dropout*, Harcourt, San Diego 1972.

MERTON R. K., The Social Psychology of Housing, in W. DENNIS, Current Trends in Social Psychology, University of Pittsburgh Press, Pittsburgh 1948.

NELSON D., *Taylor e la rivoluzione manageriale. La nascita dello scientific management*, Einaudi, Torino 1988.

RIFKIN J., *La terza Rivoluzione industriale. Come il "potere laterale" sta trasformando l'energia, l'economia e il mondo*, Mondadori, Milano 2011.

RIFKIN J., *La società a costo marginale zero. L'internet delle cose, l'ascesa del commons collaborativo e l'eclissi del capitalismo*, Mondadori, Milano 2014.

RITZER G., *Il mondo alla McDonald's*, il Mulino, Bologna 1997.

SKJØLSVOLD T.M., RYGHAUG M., BERKER T., *A traveler's guide to smart grids and the social sciences*, in «Energy Research & Social Science», vol. 9, 2015.

WCED, *Report of the World Commission on Environment and Development: Our Common Future*, 1987, http://www.un-documents.net/our-common-future.pdf.