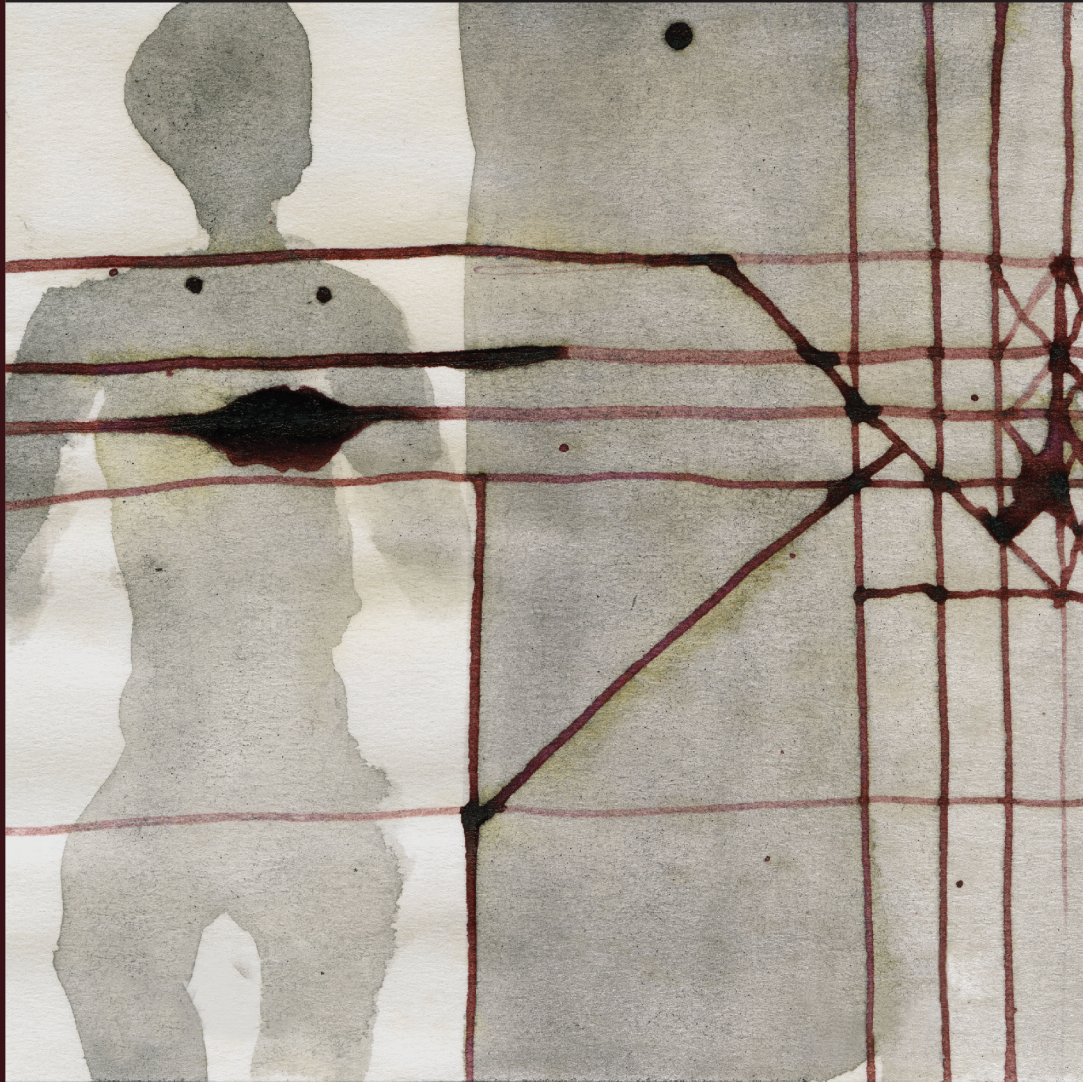


River Publishers Series in Information Science and Technology

Home in a Hybrid World
or to dwell in a networked environment

Martin Pot



Foreword by
Kas Oosterhuis


River Publishers

Home in a Hybrid World
or to dwell in a networked environment

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Antony Gormley
DAKOTA II, 1997
Carbon and casein on paper
8.9 × 8.9cm

“I SEARCHED FOR A REALITY THAT WAS MORE FULLY IN MY POSSESSION
THAN THE EXTERIOR WORLD,
AND I FOUND IT WAITING FOR ME IN THE BODY HOUSE IN WHICH I DWELL,
THE REALEST AND CLEAREST REALITY.”¹

Maria Lassnig

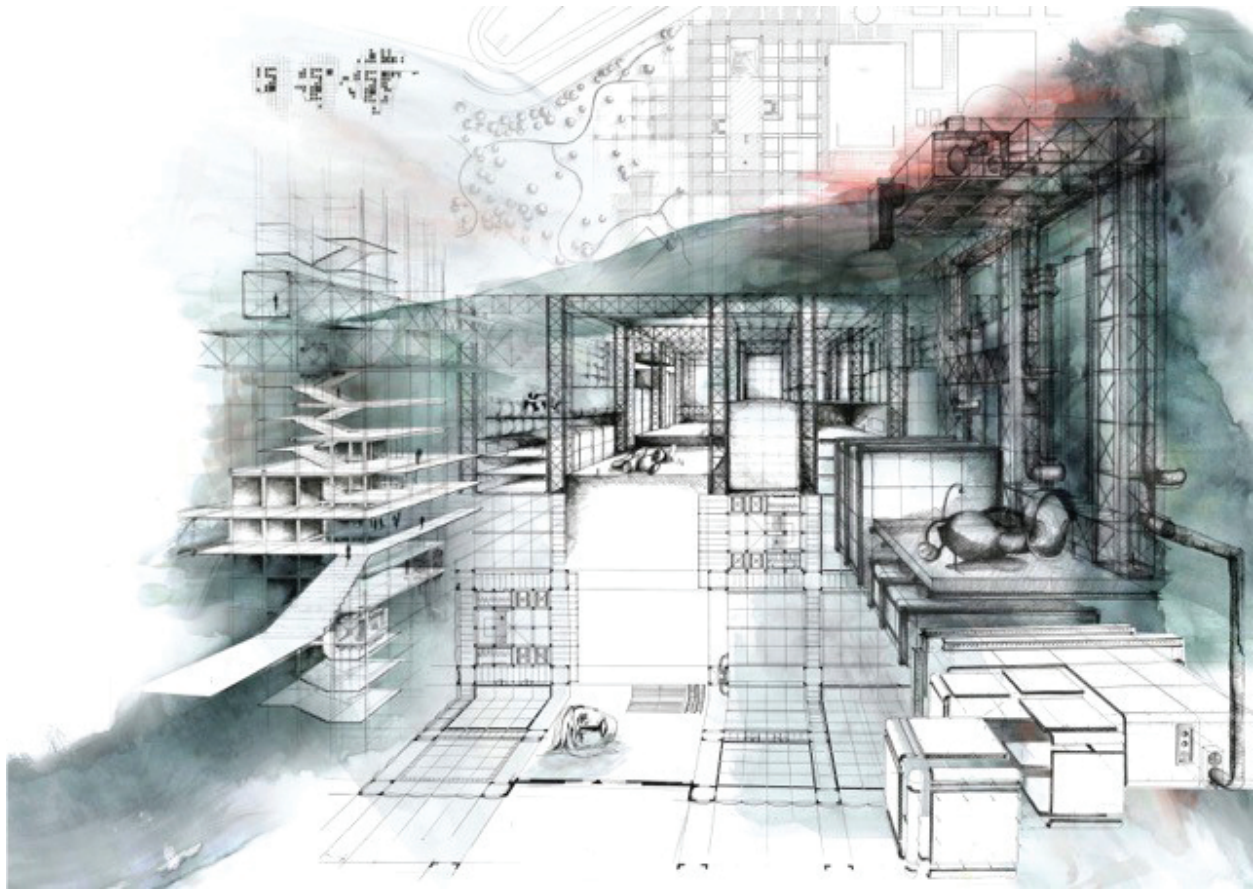
¹Catalogue Stedelijk Museum Amsterdam 2019.

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Carlijn Kingma and Nadia Pepels in 2016, 'A Factory for Art'

Preface

A Participatory World

Kas Oosterhuis, Nagymaros, August 2020

When humans enter a room or any space, the first thing they do is to check whether there is another human being in that room. In general, in their daily life, humans are primarily interested in other humans. Spatial experiences are secondary to their group instinct. Basically, according to a group of quantum physics, we are collapsing the higher dimension of the quantum state of the universe, which allows for billions of possible observed universes, into a three-dimensional space that unfolds in time by the way we perceive the universe, the world, and our immediate environment through our sense organs. We are only human, imprisoned by our senses. In that collapsed world, one's peers are the most important entities of reference.

More on the surface of their existence, in their professional life, humans might shift their focus toward a narrower band of interests. Architects may have developed a professional anomaly to look at the proportions, materials, and atmosphere of the room itself, before noticing anything or anyone else. Interior designers – the writer of this book Martin Pot is trained as an interior architect (his official qualification) – might focus on furniture and interior finishing in the first place. Such a professional deviation has its advantages since one notices things that others do not see. When architects visit a city, they typically want to see that one special building, which is a just finished masterpiece of a much published colleague; they go straight to that special place in the city, before paying attention to anything else and before seeing the people walking the streets, regardless of the fact that people and their doings are actually shaping the character of the city. By their education, architects and designers seem to have unlearned to look at their immediate environment the same way as daily users of that same environment do.

In this book, Martin Pot focuses on the notion of home, which is a renewed attempt to bring back the human factor at the forefront of the profession. Pot is not blind to recent technological development, notably to the digital invasion into the privacy of the home and believes that the notion of home needs to be redefined. This book reads as an extensive introduction to an open question. How should the home and privacy be redefined? Realizing that the new citizens have become international nomads who find their home wherever they are, wherever they work, and wherever they live for shorter or longer periods of time. Basically, the new technology allows the new citizens to take home along with them. That aspect of the new nomadic international citizen certainly is part of the necessity of a thorough redefinition of the notion of home.

But there is more; it goes in two opposite directions, the societal developments that are taking place are bidirectional. Since the world has become a deeply networked place, human beings bring the world into their private space called home. Home is a hideaway that a single person or a group of people living intimately together have exclusive access to. The material householder has the key to the front door, while the virtual home user has the password. Home, thus, becomes a merged real and virtual realm that is somehow imagined to be fully private. Yet, since the human user has allowed a variety of electronic devices in the room and apps running on cellphones and laptop computers to have access to cameras, contacts, telephone numbers, and a range of “private” data, the big tech companies and the government are looking over the shoulder into the privacy of the personal space. Martin Pot argues that one should have more control over one’s immediate environment, both the physically built environment and the sensorial sphere one lives in. After all, home is a lived space connected to the Internet of Things and People.

One way of exercising control is to shut down all digital devices, refrain from using mobile phones, and disconnect from the Internet. The other more constructive way is to find ways of establishing a bidirectional relationship with the tech companies, governmental bodies, and shared communities, which must become a process of give and take, a process of interaction. The digital revolution has this one big promise, which might give the clue to the redefinition of private space. This one big promise is the potential for user interaction, for level-playing field participation, for co-design, and for co-production. No longer should we be considered as consumers, but as prosumers instead. We are actors in an actor network. One could consider the struggle for privacy as a game of life, whereby the actors play by the rules according to their own skill levels and preferences and, occasionally, change the rules when there is a consensus to do so. The more creative people will challenge the game of life and would want to rewrite the rules of play while

playing. Writing a book is already an attempt to rewrite the rules of play or at least a contribution to form a critical mass of structural proposals that eventually converge into a substantial change in the set of rules. Less creative but nonetheless participating persons might be happy to play by the rules. Professionals may develop a high level of skill; they may enforce admiration and, eventually, propose an amendment to the set of rules. Whereas, the recreational player will be satisfied to just enjoy the game. Yet, they are both playing the same game. To interact with the space called home is the initial condition for the game of life.

Everyone has a notion of home, even the homeless, for whom the physical aspect of home is almost non-existing, and everyone participates in this game, while some are much more actively participating in changing the rules of the game than others. I believe that the solution to the privacy crisis lies in the development of participatory design instruments on all levels of the development of the domain that is called home. I prefer the word “instrument” over the word “tool;” while an instrument can be played in many different ways, open for composers and interpreters alike, all can play their own tune, according to their own interest and preferences, whereas tools are, as per definition, monofunctional. The hammer is always looking for a nail to hit. Participatory design instruments include the participation of highly skilled professionals and laymen alike. Participatory design methods are inclusive by nature. Both the professional designer and the user are considered experts, playing in the same level playing field. The user has the expertise of daily life that the professional often lacks, while it is clear that a professional has a special skill that is indispensable. The game of life is a multiplayer game. In a participatory design process envisaging to build homes, there are many different experts involved: the user, the designer, the banker, the environmentalist, NGOs, the material supplier, the circularity expert, the fabricator, the manager, the referee, and basically any stakeholder for that particular project. They all should be included in a level-playing field, supported by a real-time unfolding serious game. The game of life is an open set of rules with many parameters, which can be set by the players in real time according to their personal stakes.

The game of life is transportable, meaning that the participation is not confined to one physical home but to the mobile privacy sphere that people bear with them wherever they go. In the digital participatory future, there will be no more coming home but only taking home along. Home is where you are, where you live, where you work, where you interact with your environment, digitally and physically, and where you socialize with others. Home is as quiet or as busy as the parameters you set for your own interaction with the world

around you. Returning to the place that you once left will most likely not be the same anymore after a while. The world around you is changing fast, not in the least because you are changing yourself, and you can only have influence on its pace of change by interacting with your immediate environment in real time. You can live fast, make many connections, and become an influencer or you can live slow and live a secluded life; it is up to you in a participatory world.

*“My house is diaphanous, but it is not of glass.
It is more of the nature of vapor.
Its walls contract and expand as I desire.
At times, I draw them close about me like protective armour...
But at others, I let the walls of my house blossom out in
their own space, which is infinitely extensible”.*

Gaston Bachelard, citing Georges Spyridaki's lines from 'Mort Lucide'
The Poetics of Space

Acknowledgments

The various first seeds for these texts were, to a certain extent, probably planted in the early 1980s while working at a large architectural office in Rotterdam with a portfolio devoted primarily to housing. While working on a wide variety of floor plans and outer facades, it soon seemed clear to me that this way of designing, building, and providing housing could never be an adequate answer to a question unknown. After initially being educated and trained as furniture maker in earlier years, I studied, at the same time, in the evenings, Interior Architecture and Spatial Design at the Willem de Kooning-Academy of Arts in Rotterdam, where I researched the further discrepancies between housing for the people and the consequences for what we call home. When – later on – technological/digital developments entered architectural and sensorial space, questioning what we call home or private space I decided to start a Ph.D. on the combined subjects of architecture, technology, and dwelling. After successfully finishing the preparatory Hora-Est program at Erasmus University Rotterdam and having written my research proposal, I searched for one – preferably two – professor who would guide me; a process so far in vain. The one that did wanted to act as mentor was Kas Oosterhuis from Hyperbody Lab at TU-Delft Architecture; unfortunately for me, he was about to leave the Institute given his retirement. One clear later advice from him I remember: he argued that, given my background, experience, and current work/research, I should withdraw from my Ph.D. and write a book instead. A few years later, after some initial hesitation, I decided to follow his advice, one for which I am still thankful.

Second, special thanks to Marja Elsinga from TU-Delft Faculty of Architecture and Frans Vogelaar and Elizabeth Sikiaridi from hybridspacelab, Berlin for reading the first complete draft and their critical, yet, always supportive and constructive remarks. Third, my sincere thanks to Gerald Santucci for reading several basic chapters and providing valuable input, and to Ruud Hazes, Hilde Remøy, Frans van der Werf, and Tijmen Wisman for reading and providing valuable input on specific chapters.

Third, over the years, I have experienced a numerous, wide variety of talks and discussions with fellow researchers and/or professionals working in a large variety of disciplines; many of them have, consciously or unconsciously, directly or indirectly, in writing or talks, attributed to these texts. I will mention the most relevant ones, with my sincere apologies should I have forgotten anyone. Therefore, many thanks to, in alphabetical order:

Liam Bannon, Jan Belon, Peter Boelhouwer (for his knowledge of the housing market), Miranda Bruce, Pascal De Decker, Delfina Fantini van Ditmar (for her research experience on home and IoT), Nicole Dewandre (for her critical remarks concerning the philosophical topics), Esther Fritsch (for her comments concerning the ethical topics), Rob van Gijzel (for his contributions concerning urban topics), Usman Haque (for his ever innovative projects), Florian Hellwig (for his peripheral approach), Tomasz Jaskiewicz (for his knowledge on smart architecture), Els de Jong (for her overall experience in housing issues), Jan Jongert (for his thoughts on circularity and sustainability), Marc Koehler (for his thoughts on architecture), Bert-Jaap Koops (for his valuable contributions where it concerns privacy/legal aspects), Rob van Kranenburg (for his extensive knowledge and experience in many matters concerning society and the Internet of Things), Arie Lengkeek (for his views on cooperative housing), Ben van Lier (for our mutual discussions on relevant issues), Michela Magas (for her peripheral initiatives), Justin McKeown, Maria Molenaar (for her experience in housing corporations), Vincent Muller, Henry Nankman (for our frequent discussions), Piet Oskam (for his extensive knowledge of the building column), John Post (for our intense discussions on relevant issues), Ronald Schleurholts, Lara Schrijver, Roger Tan (for his thoughts on architecture and the senses), Catalin Vrabie, Yvonne Droge Wendel, Robert Winkel, Daan Zandbelt, Bo Zhao (for the parallel contributions), and Remko Zuidema (for his extensive experience in all issues concerning building).

Last, but not least, I owe sincere thanks to Antony Gormley for his generosity to provide the cover image of one of his artworks, and to Carlijn Kingma, Marwan Rechmaoui and Rob Voerman for the use of their images. I also thank Rajeev Prasad and Junko Nakajima from River Publishers for their continuous guidance and editorial support, as well as Nathan Verberne (Bonniefanten Museum Maastricht) and Maddalena Pelù (Galleria Continua) for their assistance in providing the images.

Last, but by no means least, thanks to my wife Marijke who understands that getting older does not imply less intellectual curiosity and granting me the time to research and write.

Munich, the "Pinakothek der Moderne," June 2007. I am standing in front of an intriguing painting by James Bishop, an American artist who, in honour of his 80th birthday, has been awarded with an extensive exhibition of his "Works on Paper." The work I am looking at is referred to as nr. 10, "Ohne Titel," (Without Title, mp) and is painted around 1970. The vague image suggests the outline of a house, reduced to its voluminous timber frame, suggested only by thin brown/ochre lines closely along the borders of the sheet of paper. In the accompanying catalogue, Heinz Liesbrock writes: *"Their lines and colours constitute one last attachment to the visible world, but one that must be restrained, almost dissolved, in order to make space for that inner note: this thing that may not itself utter, but can only be adumbrated indirectly."*

Other similar paintings suggest a three-dimensional space by its forms, by outlining the framework of a house and adding the sphere that is within. It is *"the presence of different layers in a highly constricted space, delicately evoking something in the nature of memory."* (ibid)

3

Introduction

“We shall be in serious trouble, if we do not take seriously the fact that we are constructing the new physical and intellectual environments that will be inhabited by future generations.”¹

Luciano Floridi

“Place is an organized world of meaning.”²

Yi-Fu Tuan

If I would start this publication by arguing that the world around us is changing in rather fundamental ways and would continue to conclude that one indisputable consequence is that our built environment will or should change accordingly, probably not many of us will be deeply surprised. If I would add thereafter that our homes should be part of that change, probably many though will be surprised. Where it concerns our housing – and our homes – we experience what [Edward Casey](#) referred to while defining the home as a “*paradoxical entity*”³. The fact that we need some form of shelter, protection, and privacy is for centuries now answered by envisioning and creating a built environment that provides houses – houses that in time can or should become a home. At the same time, a home is a condensed world; all that we experience inside and outside our home is re-experienced within this home, making it close to the center of our existence. Our house still is our address; however, we connect to a place that increasingly “synchronizes” with our identity since everything we do within the boundaries of our homes becomes more and more transparent, despite, by now, outdated forms of legal protection. Our homes have become the private space we can no

¹Floridi, L. (2014). *the 4th Revolution*. Oxford University Press.

²Tuan, Y.-F. and S. H. (2001). *Space and Place: The Perspective of Experience* (1997th ed.). Univ Of Minnesota Press. (p.179)

³Casey, E. (n.d.). *The Fate of Place: A Philosophical History*. Centennial Books.

2 Introduction

longer trust to be private; we retreat from public space in what is legally supposed as well as defined to be private, protected, and uncontrolled. Next, with the rapid increase of the Internet of Things/People, we are agent/participant in a networked world; in an environment that is – and above all rapidly becomes – no longer inert but sensorial, i.e., that can “see” and can “listen” – briefly, one that acts as an interface. We can answer this development by ignoring, by redefining its principles, and/or by acting to renegotiate our place and – spatial – privacy that cannot be excluded or separated as yet from its framing built environment. If we take our dwelling, i.e., our being at peace in a certain place and time, serious, we need to reclaim our role in designing and realizing the framework for a most valuable item in our life, i.e., the home. As so adequately put by [Alberto Perez-Gomez](#): *“In order to address life as lived (..) architecture must create appropriate transformative atmospheres accommodating habit as well as bringing about productive (poetic and ethical) change”*⁴.

These texts, therefore, will follow two main guidelines:

- In what ways can the principles/means that realize our housing be adapted to a more democratic and participative system?
- What is the role/position of technologies concerning our dwelling and housing in a hybrid networked world?

When, back in 1980, [Jacques Ellul](#) argued that *“He (i.e. man, mp.) now is situated in a new, artificial environment. He no longer lives in touch with the realities of the earth and the water, but with the realities of the instruments and objects forming the totality of his environment,”*⁵ he could not yet refer to our contemporary “artificial environment,” but arguing that he was ahead of the developments now seems an understatement. It is precisely the totality of the environment – natural as well as artificial – that should be the point-of-leave for envisioning what our housing should be(come), what it should represent, and what it should incorporate. Rethinking this is inclusive of rethinking the world in which we envision our life: what does it mean to have a home in a networked world? Is it still the entity we experience for centuries now, or is life in a networked world – hence including our home – fundamentally different from what we know? Is it humans that remain inert while his/her surroundings become “active”? Our traditional system of providing

⁴Perez-Gomez, A. (2016). *Attunement, Architectural meaning after the crisis of modern science*. MIT Press.

⁵Ellul, J. (1980). *the Technological System*. Continuum.

housing is one disconnected from its inhabitants/users, while, at the same time, this house – as a framework for our home – is one of the most important prerequisites in our life; we need a certain amount of private space to be able to act in public space. From there, we retreat back into our homes to experience lived space, but at the same time, “*A house constitutes a body of images that give mankind proofs or illusions of stability,*”⁶ according to [Gaston Bachelard](#).

Today, it is that “illusion of stability” that should remind us of the – by now false/outdated – guarantee that our home is a safe and uncontrolled private space, meaning that we can either reinstall what has been agreed upon when it was destined to be safe and unwatched or rethink connotation and place. I believe we should concentrate on the latter since I am convinced of the necessity to think our dwelling – and therefore our home – not only within the context of space but also of our time.

A “Foreword” (by Kas Oosterhuis) will, after the inescapable Chapter 2, “**Acknowledgments**” precede the an overall Chapter 3: “**Introduction**” which obviously will try to provide the appropriate background of the issues involved and a direction of further content. Chapter 4, “**Early and recent history**” will gather the wide variety of relevant projects envisioned and, in part, realized over the last 100 years, primarily to illustrate that what I discuss is in no way new and these projects provide serious options while rethinking. Chapter 5, “**Architecture**,” will refer to the built framework that is the basis of our housing and eventually our homes. Chapter 6, “**Housing**,” will deal more in detail with the situation and process in the Netherlands, to be followed by Chapter 7: “**Home**,” what it means to have a home and what its role is in a networked world. This brings us to Chapter 8: “**Privacy or privacies**,” an attempt to rethink and question this timeless valuable principle. Chapter 9, “**Thinking and rethinking**” will try to contemplate the theoretical background and framework, to be followed by Chapter 10, “**Awareness**,” i.e., what is needed to create further participation and discussion. Chapter 11, “**Technology and the home**,” concentrates on the mixture of the rational and the abstract. Chapter 12 “**Sustainable**” will address the actual topics of sustainability and circularity. Chapter 13 on “**Actual developments and possible futures**” gathers current research and ideas. The book ends with Chapter 14, “**Epilogue**,” an extrapolated version of the introduction. Continuously, between two chapters, a brief independent text is added (sometimes by others), illustrating various examples of peripheral topics.



⁶Bachelard, G. (1994). *The Poetics of Space*. Beacon Press. (p.17)

4 Introduction

“Technological progress offers us more efficient ways to turn back the clock.”

Aldous Huxley

“The everyday cannot be captured in a complete conception.”⁷

John Habraken

40 years ago

It is – with the inescapable imagination – almost a classic radio play. The doorbell is a fine classic example of elementary but adequate mechanics; I pull the well-polished brass knob, setting in motion a system of steel rods, rolls, and cables and hear a bell chime somewhere in the tiny house. Silence, and seconds before I decide to try again, I hear the slow shuffle of soft-soled feet on a tiled floor. The green oak paneled door opens just enough to facilitate a limited view outside, and before me stands an older man with close behind him an older woman, both with a slightly disturbed but alert look on their face. Our mutual appointment is confirmed and a few minutes later, we sit together at a small wooden table with coffee and chocolate biscuits; I experience a setback in time. Two people, living together the greater part of their lives in a world changing around them, in a private space that has not changed whatsoever over the decades. I sense the distinct smells of bee’s wax, roses, and *eau de toilette*; I notice the original bakelite electrical switches and antique wallpaper, old rugs, stained-glass lamps, and well-maintained furniture. Junichiro Tanizaki, while referring to the classic Japanese house, described it so thoughtfully: *“(But) the quality of what we call beauty can only originate from the reality of everyday”⁸*. (transl.mp)

The couple has been informed a few months earlier that, unfortunately, they do have to leave the home they live in since its completion in 1921 for about a year, but explaining all of this face-to-face and with great care slightly seems to restore the faith, if even the belief that in the end, it will be for the better. Still, that is the ratio, the pragmatics, but can I honestly justify what I have just explained to them?

⁷Habraken, N. J. (1967). *het Alledaagse, over het ontstaan van de omgeving van alle dag*. Lemniscaat.(p.8, transl.mp)

⁸Tanizaki, J. (1933). *In’ei raisan*. (Ned.vert.: *Lof der Schaduw’*, Meulenhoff 1993) p.32.

They have good reasons to be worried: my visit is a consequence of the decision made by the housing corporation together with the municipality to renovate their house. This project, back in 1980, concerns the historical workman's garden village Vreewijk in the southern part of Rotterdam. These small houses, all together about 4000, built around 1920 and designed by M. J. Grandpré-Moliere and others were raised for the "less fortunate population" but were, by now, in desperate need for a full and thorough renovation. Considered too small for "modern times" and in serious need for new electrical, gas, and water infrastructures and isolation, the village will be renovated in sections, sometimes its houses even enlarged by merging two houses into one. Great care is exercised to ensure the historical character of village, and public space and houses are maintained, but its inhabitants cannot stay in the house during renovation. This also was the period, i.e., early 1980s, in which it became customary to involve the inhabitants in the process of renovation. Afternoons and evenings in the local village house were devoted to explain what was to be done and why, what were the choices they had. It was, however, involving people in unfamiliar processes and – to many – complex procedures they never were involved in before. Their houses were designed and built for them, not with them.



Now

It is staring me in the face for quite a long time now and I have to admit that a real and proper understanding of its current status has not yet surfaced. Before me, on my desk, is a small, somewhat torn gray booklet and on my laptop-screen a reference text; both from quite different moments in time but also both pointing to an issue – or a wake-up call, maybe even a desire – that I believe should have become a reality or even standard practice long ago and most certainly by now.

The first, published in 1962, is written by [John Habraken](#) and is named "de dragers en de mensen"⁹ ("the supports and the people"). It is a condensed but clear and timeless plea for a fundamental reorganization

⁹Habraken, N. J. (1972). *de dragers en de mensen*. Scheltema & Holkema.

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and realization of the principles of process and enhanced participation of the inhabitant by creating a split between common basic structure and further private infill, thus, answering the need for more flexibility as well as individual ways and means of providing private space. That is, “the idea that the built environment is the product of an ongoing, never ending, design process in which environment transforms part by part”¹⁰.

The second is a far more recent statement made in 2017 by the Belgian architect/urban designer [Leo van Broeck](#) who, on several occasions that time such as keynotes and interviews, called for a paradigm-shift: *“Architecture is now more than ever designing housing. We should (re)organize the spatial presence of the human species on earth and stop the wastefulness of space. That is our deontological duty”* (transl.mp).

What binds these two statements is the fact that both question the ontology and framework of our housing, the position/role of architects and inhabitants, as well as the full process of how to realize a private human sphere. I could cover the many pages to come with the various initiatives over the last decades that rethought our “place on earth” and envisioned (built) environments that would provide an adequate answer to changing social circumstances or even fulfill the sometimes latent desire for a new utopia. Even now, while writing this text, the call in the Netherlands for more housing – without questioning the where and the how – avoids or even neglects a much needed fundamental rethinking, regardless of what it even means to have a home in an increasingly networked or hybrid society. There is just the unarticulated call for “more houses.”

To a certain extent, this rethinking tends to become blurred because some of its primary elements fail to become part of the thinking process. Fact is that we all have a home of some kind; it may be an elementary box on the 30th floor or a spacious apartment or it may be a tiny house or spacious villa, a dilapidated cardboard box, or a camper on wheels: we all return daily to a place we call home. Our dwelling, in the words of [Peter Sloterdijk](#) *“is de-thematized because it is meant to produce habituation and triviality”*¹¹ (transl.mp). It provides us with the elementary preconditions of a refuge, of spatial privacy, and of a private space to withdraw in to be able to act in public space.

¹⁰<https://web.archive.org/web/20110726140637/http://www.habraken.org/html/introduction.htm>

¹¹Sloterdijk, P. (2009). *Sferen II / Schuim*. Boom Onderwijs. (p.367)

This “classic” dichotomy is under pressure; despite the fact that the (Dutch) law defines spatial privacy legally by stating that unlawful entry is not allowed¹², an increasing number of digital “innovative” developments cause serious breaches in this protection. Since our home is not some Faraday’s cage, the suppliers of various (digital) technologies now available utilize our private space and gather (personal) data to accommodate commercial third parties; see, e.g., the smart TV, the vacuum cleaner, the smart meter, Google’s Home, and Amazon’s Alexa. The number of these “smart home” technologies – many of which are technological “solutions” desperately in search for a real problem – will only increase and cause a serious breach in what we consider (legally) protected private space. Thus, illustrating that we need to decide whether we wish to consider our physical private space to continue to exist as it is and has been for centuries or that we need to rethink the ontology of our private space and may come to the conclusion that changing the parameters of today is inevitable and that we need to/should focus on other more contemporary as well as future solutions.

While rethinking, some actual developments can no longer escape our attention and, above all, withdraw from a possible solution. The current topics of housing turning into commodities, growing cities, building waste, circularity, sustainability, changing households, housing refugees, and the homeless, as well as the increasing costs of (building) housing all need to be addressed; all require discussion far beyond the single simplified question of how to realize ten thousands of houses. The process of building housing is for decades structured and maintained along traditional lines, fixed procedures, bureaucratic regulations, and processes in which the inhabitant has no significant role. The entire process was – and in fact still is – one of supply instead of one of demand: the house as a commodity. The one issue that has a fundamental role in our “place on earth” is one from which the inhabitant is excluded, while, at the same time, the options for real participation and realization have and will become more realistic than ever; in the words of sociologist Richard Sennett: “*we need an open, interactive way of building the environment*”¹³. Thinking about democratic changes implies thinking about what is vital to our position as citizens, the most important being our private space and the ways and means in which its physical appearance is organized, designed, and, above all, realized.

¹²Art. 12 Dutch Constitution.

¹³Sennett, R. (2018). *Building and Dwelling*. Allen Lane. (p.263)

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Tempting as it is, it seems easy enough to discuss the various elements that play their role in this individually, i.e., contemplate the position of our home, question the process of designing housing, and/or dismissing the building chain that is responsible for the result. The actual situation, however, is that all individual parties in this process all are just one link in the complete chain; removing one could mean neglecting or even removing possible solutions for a substantially improved result. At the same time, the saying, one cannot solve a problem with the same parties that are responsible for creating the current situation is – in part – true. It will require a serious attitude and reflection by all parties involved to rethink the problems at hand and create the preconditions for a real shift in realizing our housing. However, I believe that, paraphrasing [Marshall McLuhan](#): there is absolutely no inevitability as long as there is a willingness to contemplate what is happening.

These texts, therefore, are *not* scientific texts about changing architecture only, *not* primarily about assumed disruptive technologies and *not* just about future housing. These texts are an attempt to align and synchronize all three with today's – and above all tomorrow's – hybrid networked world, raise the awareness, and stimulate the much needed discussion on a topic that concerns us all: we all have a home. I am aware of the fact that this topic involves several disciplines, many interests, and as many roles; especially over the last couple of years, we all should be familiar with the still continuing discussion concerning our housing, a discussion on a topic that is far too important to delegate to professionals only since their interest is not always compliant or in line with those of the inhabitant. Unless we think of or envision a changing ontology, it will, for decades, remain some physical translation to answer our need for spatial privacy; at the same time, this translation should incorporate the innovative technologies and creative options that facilitate a sphere that provides man the awareness that our place on earth is so much more than a physical shelter only.

Imagination and synthesis

Goethe once described architecture poetically as “frozen music” and music as “liquid architecture,” presumably referring to mutual atmospheres instead of any mathematical parallels. Centuries later, after his countryman and German artist [Anselm Kiefer](#) had moved to the village of Barjac in Southern France in 1993 and started modifying the remains of an old silk-factory into a work of art, he thus created an installation or

– in German – “*ein Gesamtkunstwerk.*” On this, in 2010, Sophie Fiennes produced the film/documentary¹⁴: “Over your cities grass will grow,” showing the abandoned factory with its tunnels and hidden spaces as well as the elements added by Kiefer. It resulted in a somewhat dystopian world, revealing what could happen after we have failed to address what is truly important but without addressing its purpose: it is acting and creating with nature, architecture, art, and materials.

I remember the words of [Walter Gropius](#), back in 1919: “*Together, let us desire, conceive and create the new structure of the future, which will embrace architecture and sculpture, painting - in one unity*”¹⁵. Idealistically as this may sound, our life is not primarily about ratio and efficiency, reality is not the totality of information and our life is not to be represented as the sum-total of behavior and data. Art, free and/or constrained, provides us with the alternative, the un-thought, the disruptive, and the possible.

Art, said [Donald Judd](#), is “everything at once.”

Why now?

In March 2019, the [Triennale Milan](#) opened: in her explanation curator Paola Antonelli refers to some issues connected to its theme “Broken Nature.” The Triennale “highlights the concept of *restorative design* and studies the state of the threads that connect humans to their natural environments – some frayed, others altogether severed” ([ital.orig.mp](#)). Architecture is explicitly mentioned as one of the themes involved.

As said, if there is one thing we all have in common, it is the fact that at a certain moment in time, at the end of the day, we return to a place we call home. That may very well be a temporary one or our own familiar place, but it should be a place where we dwell, i.e., where, at least for the moment, we are “at peace.” It is a space, a place we all have, or at least are entitled to have, according also to the declaration of human rights. Why, one might question, this written exercise to rethink or maybe even (re)define a topic that is so familiar to everyone, so common in human life. Let me recall [Walter Benjamin](#)’s thinking, rephrased by Brian Elliot:

¹⁴https://en.wikipedia.org/wiki/Over_Your_Cities_Grass_Will_Grow

¹⁵Bauhaus Manifesto, 1919.

“the meaning of the present is latent within the past; and, second, that this meaning can only be made explicit through recollecting the material environment in which past experience is embedded.” The present, however, is a time permeated with developments and circumstances that have become – to a certain extent – out of control; technological innovations become less embedded in their necessary social/ethical frameworks and the number of people that is excluded by their – supposed – advantages increases. In general, politics and society fail to succeed in justifying, let alone embedding technological developments in society, let alone create acceptance. Within the building column, digital innovations are too often limited to the process of designing, building, and maintaining, not as a way and means to involve the inhabitant in the full and enduring process of controlling the environment and data which increasingly are an embodied part of what constitutes that environment. There is no longer a world consisting of data/connectivity and a world free of data/connectivity; [Luciano Floridi’s “infosphere”](#) is a reality that frames our world.

100 years after Gropius, today’s rationalized world also tends to neglect or sometimes even dismiss the arts as important influential element, as irrelevant within our attitude of emphasizing control and efficiency and thus quantifying everything around us. The Dutch philosopher Thijs Lijster argues, however, that art is not a passive object, we do not reflect on art but art reflects in itself. If we include architecture – classically referred to as the mother of all arts – in this, we enter a relevant topic: after all, architecture is experienced by moving through the spaces it provides or creates. Many performing artists, e.g., in ballet and performance make use of a certain space to “contemplate or discuss” their role, position, and movement; many architectural projects (see Chapter 4) balance on the thin line between art project and building. In 2007, [Peter Zumthor](#) completed the [Bruder Klaus Kapelle](#) in Wachendorf, Germany, based on the initiative from a local farmer and realized in close cooperation with volunteers. Ultimately situated within a rectangular building, a small tipi-shaped chapel was constructed on the basis of thin tree-trunks covered in concrete. The trunks were burned over three weeks after the concrete hardened, leaving – together with small windows – an atmosphere inviting reflection and meditation. It is, paraphrasing Lijster, an environment that reflects *in itself*, providing a sphere that “performs” far beyond the realm of architecture only. Elementary architecture as such is an example of creating a sphere that is in no need of “technology” – let alone digital assistance – to deliver more than the requested functionality only; i.e., a sphere for contemplation and thinking our “place on earth.” In an interview with Susan Perkins in 1999, Zumthor argues: *“I think a good building should be – and all pieces, all pieces of art – they should be like nature more. And this I think you achieve if you stick to use.”*

Linking the above to the need for dwelling, we may well arrive at the conclusion that our dwelling is not only influenced by the need for a roof over our head; after all, the most elementary construction will do. The urge to feel free, safe, and private in a certain place is accompanied by the human need to experience the less explicit or rational contents of life. We carefully choose the elements that shape and color our environment, we listen to certain music fit for a certain moment, we dress different for a party, we make sure that we smell a rose instead of a sewer, and we select specific pictures to be shown on the walls. All these random influences and atmospheres can – in a hybrid environment – be provided/steered by technological innovations and together balance the complete sphere we inhabit or utilize at a certain place, at a certain time. In 1958, when [Edgar Varèse](#) composed the “Poème Electronique” for the Philips Pavilion at the World Fair in Brussels, he did so in close cooperation with architect [le Corbusier](#) and designer/composer [Iannis Xenakis](#).

Especially over the last years, we become more and more aware of some elementary issues in our lives, e.g., the origins of our food; we increasingly understand that if we use local suppliers/farmers, we can waive long transport/logistical processes, raise the quality of our foods, and buy what we really need. We have begun to realize that we need to transform our ways of producing energy and of utilizing smaller (electrical) or even no cars and use one of today’s many variations on a bike and reject plastics and need greener, more livable cities. At the same time, the principles of organizing the building chain in the Netherlands remain almost unchanged for more than 50 years now and are as such responsible for 40% of the waste; an average renovation of a single house produces some 5 tons of waste. Notwithstanding the fact that this situation is comparable in most European countries, I will use the Netherlands as a guiding line. First, to make this not an inventory but an underlayment for discussion that is by no means limited by choice of country. Second, because my densely populated country could very well serve as a useful – and hopefully innovative/creative – example.

I will argue in the coming chapters that the envisioning and process of building and supplying houses needs a thorough rethinking in favor of a far more democratic/primary role for the inhabitant, more industrialization, more standardization, increasing flexibility, and adaptability based on principles of sustainability and circularity and, hence, less waste. I will also argue that our built environment – therefore including our housing – cannot and should not escape the relevant digital technologies, assuming they serve a subordinate and/or facilitating role. Last, but not least, I will emphasize the position and role of the arts in this entire

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process and result since I am convinced that its role within the topic is deeply underestimated as well as undervalued.

Why, one could ask, repeating the initiatives to address yet another vision, why another rethinking? Someone recently remarked that the future is the answer to today's questions. My answer, to be elaborated and articulated in the coming chapters, would be that these times are fundamentally different from the ones "behind" us; i.e., besides the fact that developments influence us even faster, they have also entered the space that we consider and define as private. When the concept on which we base our views of society becomes once more subject to serious change, we can turn our back and withdraw in privacy, or we can rethink the concept and renegotiate our place. I do not intend to raise any moral judgment in this; what I do wish to emphasize is the need to address and answer these questions by all of us, be it from in a philosophical, ethical, technical, or social point of view.

Preferably, "everything at once."

Brussels: only a few years ago. On my way from the Central Station to the buildings of the European Commission, I climb the stairs to the “Mont des Arts,” walk the pedestrian crossing, and hear music, together with a loud singing. Traffic blurs my hearing, but as I come closer to the other side, I encounter the source: in a corner of the “Maison de la Dynastie” under the tall columns someone has created a shelter, a carefully built space using tent cloth and otherwise useful materials. At its entrance, some plants try to provide the missing link with nature, so absent at that location. The entire shelter looks properly maintained, no signs of neglect, no signs of garbage — space made into place. The clearly educated voice comes from within and is “live,” and the accompanying music though is some recording but balanced — no sign of the performer performing. The entire “stage” looks like a setup that is almost intended to be there; it does not seem out of place. While the voice continues to perform some *cantata* or *lamentate*, I see other pedestrians stop and listen as well; no signs of disapproval but only attention, resignation, and respect.



Photo: Martin Pot.

4

Early and more recent history

“Technological progress offers us more efficient ways to turn back the clock.”

Aldous Huxley.

“When the peaks of our sky come together, my house will have a roof.”

Paul Eluard

In particular, since the beginning of the 20th century, a wide variety of architects/artists envisioned a society that was often situated in a synthesis of architecture, media, and art; sometimes – usually years or decades later – considered utopian. These projects were primarily thinking projects; i.e., a creative rethinking of what the (spatial/architectural) consequences could or should be in times of social and technological innovation and development. In [Anthony Vidler](#)’s phrasing, it often was “Vagabond Architecture”; some were close to reality and some were, in fact, utopian but more often also clairvoyant when it was built upon or structured around technological innovations. We can conclude that, besides some stand-alone art projects, these ideas almost never became a reality for various explainable or legitimate reasons. Nevertheless, many projects are still subject of research and education at, e.g., architectural schools since they incorporate the origins of doubt; i.e., the free thinking of the social (built) environment and its translation into architecture. It is – again – this rethinking that, in my view, is inescapable today since many other options to translate actual problems into fundamental solutions and innovation into practice seem inadequate or insufficient. I will concisely mention here, for this publication, the most relevant ones over the last 100 years in chronological order and related to housing since various other writers/researchers have discussed in-depth projects both

individually or as a coherent group. On some, however, I will elaborate further later on since they then touch(ed) upon developments that by now have – or could – become a reality.

The early projects

The emphasis as well as the similarities here originate to a large extent not primarily in the fact that they were new or innovative as such; the value is in the fact that the majority was thought from a much broader perspective, one that did not only derive from architectural principles but also joined with social and/or its philosophical rethinking. It also implied that various projects were ahead of their time and often considered utopian. Having said this, it remains noteworthy, however, that in particular those projects dealing with housing regain(ed) their value after many decades.

It is 1915 when Le Corbusier designs his “[Maison Dom-ino](#),” an early attempt to solve the housing problems in a systemic/industrial way. His solution was a transparent frame – three floors, six columns, and stairs – produced industrially, leaving open as much space as possible for a personalized “infill.” In 1925, Austrian [Frederick Kiesler](#) realized “Space-House,” again primarily more of a structure than a real “house.” Kiesler made a difference between the “Idea of a house” and one from a “unified architectural dogma”; his point-of-leave was the latter, indicating that it should be defined as “Time-Space-Architecture”¹. Around 1920, again Le Corbusier designed the Union Habitation/Ville Radieuse in France, a community building raised from ground level with extensive communal spaces including a spacious roof terrace. It was designed in close cooperation with [Charlotte Perriand](#) who created (parts of) the interiors; it still is an example of functionality in housing.

After the Russian constructionist Georgii Krutikov, in 1927, envisioned his “[Flying City](#)” drifting above earth, a year later, a more practically oriented Richard Buckminster Fuller completed his “[4-D/Dymaxion House](#),” a half-dome (and various rectangular alternatives) constructed on the basis of an independent steel structure that already then included the means to, e.g., reuse water for sanitary purposes. More important – and above all actual – here though, as Robert Marks notes: “*Fuller holds privacy to be a condition that can be*

¹Kiesler, F. (1996). *Selected Writings*. (G. Gohr, S & Luyken, Ed.). Gerd Hatje.

violated only through the sensorial spectrum. (...) the range of the harmonic capabilities of the house should be comprehensive with respect to the spontaneous articulation of all the senses of the dweller”².

It is 1924 when Mrs. Truus Schröder-Schräder asks the Dutch furniture-designer [Gerrit Rietveld](#) to design a house for her and her three children. Being adamant about her preferences and desires, she demanded a house that would be simple and functional; for Rietveld, it was his first house and it fitted entirely the ideas of “de Stijl” Movement. With its adaptable floor plan by means of sliding walls, it became – and still is – an icon of modern architecture.

When the Czech [Karel Teige](#) created his “Minimum Dwelling” in 1932, in an attempt to solve the shortage in housing, he tried to answer the need for every human being to have some room for him/herself while, at the same time, emphasizing the value of the other – social – functions, to be shared and commonly situated. It was a “radical rethinking of domestic space,” together and in close cooperation with other disciplines, e.g., sociologists and economists.

An interesting example of an early approach to industrial fabrication is the work of Konrad Wachsmann; envisioning a far more mass production of building elements and his cooperation with Walter Gropius resulted in 1942 in a “Packaged House System”, a modular system for a house to be fabricated within a day.

An early “classic” example of the often complicated individual relation between patron and architect occurred in 1950 when Ludwig Mies van der Rohe became the architect for the “[Farnsworth House](#)”³, a retreat in modernist style for Mrs. Edith Farnsworth who, at the end of the building process, filed a suit to van der Rohe. Next to a dispute about increased costs, her views were quite contradictory to the architect’s since, however, she had approved design and drawings, she ultimately lost the case.

In 1953, Situationist’s [Gilles Ivain](#) – aka Ivan Chtcheglov – wrote in his “Formula for a New Urbanism” that “Architecture is the simplest means of *articulating* time and space, of *modulating* reality and engendering dreams. It is a matter not only of plastic articulation and modulation expressing an ephemeral beauty, but of a modulation producing influences in accordance with the eternal spectrum of human desires and the

²Buckminster Fuller, R.; R. M. (1960). *the Dymaxion World of Buckminster Fuller*. Anchor Books.(p.19)

³https://en.wikipedia.org/wiki/Farnsworth_House

progress of fulfilling them. The architecture of tomorrow will be a means of modifying present conceptions of time and space. It will be both a means of *knowledge* and a *means of action*. Architectural complexes will be modifiable. Their appearance will change totally or partially in accordance with the will of their inhabitants”⁴ (ital.orig.,mp).

In 1956, the (Hungarian-born) French architect [Yona Friedman](#) created his “Ville Spatiale,” a structure adaptable and modifiable according to the wishes of its inhabitants; it was “mobile architecture decided on by the occupant.” Friedman used a description derived from a phrase by Abraham Lincoln: “architecture with the people, by the people, for the people”⁵. Also in 1956, the English architects/partners Alison and Peter Smithson completed their “[House of the Future](#),” in fact not a purely architectural project but an envisioning of what a future interior would look like. With its clear emphasis on technological innovations, it was critically questioned in the media: “This is a House?” (sic.)

In 1961, [John Habraken](#) publishes “de dragers en de mensen” (“The supports and the people”), not so much a design for individual housing but an encompassing vision on citizen’s participation and its (pre)conditions; with a clear emphasis on the “everyday” architecture.

*“I believe that our society will be and should be diversified. A society in which the individual is happy is one in which each person can display his individuality and yet social order is maintained, where greater freedom and a larger variety of options are possible.(..)
Future society should be constituted of mutually independent individual spaces, determined by the free will of individuals. Systems are necessary but our policy should be to develop the possibility of acquiring greater spaces for individuals on the basis of system, not one to reduce the spaces for individuals to conformity through the instrument of system. Given this proposition, each space should be a highly independent shelter where the inhabitant can fully develop his individuality.”*

Kisho Kurokawa, *Metabolism in Architecture*, 1977. (p.79)

⁴<http://www.bopsecrets.org/SI/Chtcheglov.htm>

⁵Friedman, Y. (n.d.). Architecture with the people, by the people, for the people. MUSAC / Actar.

In Japan, around 1960, the [Metabolists](#) fused ideas about architectural mega-structures with those of organic biological growth; in the words of William Gardner: they “*believed that architecture and the city should be designed to remain open to processes of growth, decline, and transformation*”⁶. By creating large – primarily vertical – support-systems equipped with “capsules,” i.e., standardized housing units (by, e.g., Kisho Kurokawa who referred to them as “*a dwelling of Homo movens*”⁷, or Arata Isozaki) the group searched for a synthesis based on, e.g., Marx’ work. In the early 1960s, as almost the entire visionary opposite, it was again Frederick Kiesler who created his “[Endless House](#),” a “*continuous living area in which one can find seclusion*”⁸. Kiesler, whose writings offer a rethinking of not only architecture but also its clear links to the arts, argued that “*Art creates life. Thus living in the ‘Endless House’ means to live an exuberant life*” in which “*nothing can be taken for granted.*” He emphasized that “*every mechanical device must remain an event and constitute the inspiration for a specific ritual*”; it was to be “*the last refuge for man as man.*”

In the USA, Paolo Soleri founded in 1970 his [Arcosanti](#)-project in Yavapai-county Arizona, structured around the belief that architecture and ecology should merge into what he called “Arcology.” It envisioned a deal in the relation between humans and environment, focusing on sustainability and our attitude toward nature. Its more recent attention is caused – apart from Soleri’s writings being published now 50 years ago – by the fact that his thoughts touch upon the current thoughts of, e.g., ecologists Timothy Morton and Graham Harman.

The Dutch artist Constant Nieuwenhuys, like Ivain member of the Situationist movement between 1958 and 1960, worked between 1956 and 1974 on his “[New Babylon](#),” a visionary project based on a book by the Dutch historian Johan Huizinga: “*Homo Ludens*” (1938). Envisioned as a post-revolutionary and anti-capitalist society in which nomadic man – due to further automation – could devote time to play and creativity, the project was later declared “unlivable” by many. As Jeroen Onstenk – citing Constant – illustrated in 1984: “*New Babylon is a design of something that really can’t be designed, i.e. the self-creative capacity of people to constantly change their environment. This paradox can indicate the limit of the possibility of designing a future model. The artist-revolutionary offers his model and modestly retreats himself with the statement ‘the true designers of New Babylon, however, will be the new Babylonians*”

⁶Gardner, W. (2020). *Liquid Cities. Places.*

⁷Kurokawa, K. (1977). *Metabolism in Architecture.* Studio Vista.

⁸Kiesler, F. (1996). *Selected Writings.* (G. Gohr, S & Luyken, Ed.). Gerd Hatje.

themselves”⁹ (transl.mp). While Soleri’s project was, to a large extent, situated underground, Constant’s plans consisted of large interconnected “sectors,” i.e., structures – comparable with Friedman’s “Ville Spatiale” – above ground level that included variable infills to be used where and when needed. It became a vision close to Friedman’s work, be it that it was more detailed and based on (upcoming) technologies. Constant emphasized that the entire project was achievable from a technological point of view; but, as [Jos de Mul](#) puts it in perspective in an extensive article, he was also “*reluctant to invest too much hope in the creative potentiality of the computer*”¹⁰.

In particular, the creative projects envisioned by the various British members of [Archigram](#) (Warren Chalk, Dennis Compton, Peter Cook, David Green, Ron Herron, and Michael Webb) were primarily structured around the technological developments, with an open mind to other disciplines. Likewise, Cedric Price’s “[Fun Palace](#),” a “laboratory of fun” realized in the early 1960s in close cooperation with theater-director Joan Littlewood who “believed in the community and in the genius in every person,” was intended “*as an opportunity to radically question how postwar society might rethink its engagement with learning and entertainment – to open up culture, science and education.*” In that sense, it was not so much about housing only but referred to/focused on the options technology offered to link and experience spaces. In the end, Archigram’s ideas were, much like Constant’s, not adopted by the larger part of society.

*“Archigram contended that architecture should not create fixed volumes of space to be mutually inhabited, les still shaped masses of masonry, but must provide the equipment for “living”, for “being”. The extent to which the architectural profession was failing to design this equipment revealed to Archigram that technological modernism was an incomplete revolution, reduced to a dowdy, killjoy version of itself, colorless, hard-edged, frugal, planned rather than chosen.”*¹¹

(‘Archigram’, Simon Sadler)

⁹Onstenk, J. (1984). In het labyrint. Utopie en verlangen in het werk van Constant. *Krisis*, 15, 4–21.

¹⁰Mul, J. de. (2009). Database Architecture: Anthropological Reflections on the Art of the Possible. *Journal of Asian Arts & Esthetics*, 3, 1–14.

¹¹Sadler, S. (2005). *Archigram: Architecture without Architecture*. The MIT Press.

On the small-scale Michael Webb's "Cushicle" (1964) was an approach to providing basic shelter, i.e., the minimal requirement for a house, inflatable and to be carried on the back. Likewise, in 1965, [Francois Dallegret](#) created, together with [Reyner Banham](#), his drawings on "Un-House, Transportable standard-of-living package," i.e., an inflatable bubble with a range of technologies devoted to a more environmental-friendly attitude. Banham himself criticized that same year the American habit of incorporating technologies in the home to such an extent that he questioned the need for a house to hold it all up ("A Home is not a House").

That same year – 1965 – the "SAR" was raised; the Dutch Foundation for Architectural Research. Although not primarily focused on individual housing, its goal was "the stimulation of industrialization in housing." Today, known as "Open-Building," it argues that "Buildings – and the neighborhoods they occupy – are not static artifacts even during the most stable times, and during times of social and technical upheaval need adjustment in some measure to remain attractive, safe and useful." Given the topic of this book, I will go into more detail in Chapter 11.

An interesting, though somewhat derived (or anarchitectural), approach was exercised around 1970 by [Gordon Matta-Clark](#), who despite being educated as an architect acted as a socially moved artist first. His "Office Baroque" in Antwerp though was an attempt to explore and surface a building's history by literally cutting out sections of the building. The Austrian group [Haus-Rucker-Co](#) explored "*on the one hand, the potential of architecture as a form of critique, and on the other the possibility of creating designs for technically mediated experimental environments and utopian cities*"¹². For example, their "Oase nr.7," an inflatable "balloon" structure attached to the surface of the Friedericianum at the 1972 Kassel Documenta nr.5 questioned the possibility of play and relaxation. This approach joined other movements at the same time, like Archigram and the Situationists.

In 1975, [Christopher Alexander](#) wrote, with various other authors, "A Pattern Language"; a system of all together 253 methods to design and realize the environment, from city level to house level, which was guided by "*the observation that the most wonderful places of the world were not made by architects but by the people.*" The following "A Timeless Way of Building" was a more philosophical attempt to research the – additional – hidden qualities in architecture as an art, not as a way to provide buildings only.

¹²<http://spatialagency.net/database/haus-rucker-co>

Individual housing also became the subject of conceptual/theoretical exercise; in 1975, Peter Eisenman's "[House VI](#)" – the last of a series – was designed and built in Connecticut, USA for the Frank-family. It was a concept for a house, not – by traditional standards anyway – a house to live in, i.e., certainly not by the standards of Mrs. Suzanne Frank who wrote a devastating critique afterwards ('the Client's Response', 1994). Eisenman questioned the (im)possibility of our dwelling in times of images together with the traditional ways and means in which we relate to and occupy our home. House VI, created as an envelope on the basis of a shifted 3D grid, included "disruptive solutions" (such as a stairway leading to the ceiling or a column between both marital beds); the house turned traditional connotations upside-down. Likewise, architects/artists [Diller Scofidio](#) in their Capp Street- project "withDrawing Room" (1988) sought "*the level at which uncertainty dances*" (Roemer van Toorn). The user of space is disturbed in his/her experience; traditional connotations and expectations are not accounted for.

In 1985, Toyo Ito created "[Pao](#)," a small dome-tent-like structure made of steel tubes and textiles that also served as a filter or membrane for the "media," providing a sheltered sphere for the urban (in particular female) nomad. In 1989, Ito designed a more altered and sophisticated version: "Pao II."

Following up on Habraken's Open Building principles, Yositika Utida realized the [NEXT21](#)-project in Osaka/Japan. It consisted of 18 houses designed to accommodate a variety of households, on the principles of flexibility and sustainability, together with a "wildlife-habitat."

From a spatial point of view, the "[Curtain Wall House](#)" in Tokio (completed in 1995) by Shigeru Ban is worthwhile referring to: a structure/level above ground that is separated from public space by a removable heavy curtain only, questioning whether, here, we ultimately deal with the house or the street, or private space vs. public space. John Hejduk's "[Wall House](#)"¹³ aims, besides – like Eisenman – trying to disrupt conventional expectations and attitudes in the house, to deal with the privacy issue; qualified once as "Unmasked living"¹⁴, the design of the house forces the inhabitant to make a conscious choice when entering a room. Staying in a room often implies being exposed to the outside world; it requires a rethinking of what is considered private and what is believed to be public¹⁵. His "Good Neighbor House" (1975) consisted of two houses situated back-to-back, but its inhabitants can see each other by means of technology, i.e.,

¹³Only one example is realized in Groningen/Netherlands.

¹⁴'Ontmaskerd wonen', Arthur Wortmann, in Archis 6-88.

¹⁵See the article by artist Auke Hulst, NRC, 19.01.2007, p.25.

through spyholes and periscope. Life is not hidden behind a façade but needs to be consciously organized. A Japanese example of trying to deal with issues of privacy is, e.g., Tadao Ando's "[Kidosaki House](#)," built in Tokyo in 1985–1986. Its private spaces are completely hidden by a quarter-circle wall, revealing nothing at the public space outside. Behind the two-storey concrete wall is — like in many of Ando's designs — a courtyard that is central in the design of the house. In 1991, [Rem Koolhaas](#) delivered a project of 24 houses in Fukuoka, Japan; all three-storey houses, accessible from a central courtyard play with public vs. private, with light vs. dark, and with closed vs. open. The ultimate result is, in Christophe van Gerrewey's words "*collective and concentrated loneliness*"¹⁶. In 1998, Rem Koolhaas designed the "[Bordeaux House](#)" for a principal who, after a car accident, became paralyzed and sentenced to a wheelchair. Nevertheless, he insisted that he wanted "a complex house because the house will define my world." The result was a three-storey building that incorporated a large elevating platform connecting all levels, thus making the entire home accessible to its inhabitant.

An interesting (Dutch) project was [Carel Weeber's](#) "Wilde Wonen"; its introduction dated back in 1997. It "*is the farewell to state thinking in architecture. It is an impetus to shape homes and living environments for an emancipated population in a free market*" (transl.mp). Its goal was a more open/free design and realization of individual housing, without the interference of project developers and/or corporations. On the larger scale, it never became a reality but did cause much discussion in the media, back then and many times after when the discussion on other ways/means of building housing and the position/role of the inhabitant surfaced.

The "[Bioscleave House](#)" in New York by Shusaku Arakawa and Madeline Gins¹⁷, completed in 2008, tries to offer an environment — "*an inter-active laboratory of everyday life (..) to extend the human lifespan*" — that stimulates the awareness and, together with their other work (i.p. "Reversible Destiny"), offers possible options for enhanced and extended experience.

¹⁶Gerrewey, C. van. (2019). Transparante Architectuur in de twintigste eeuw, van Le Corbusier tot Rem Koolhaas. *De Witte Raaf*, 199, 7–9.

¹⁷<http://www.reversibledestiny.org/architecture/bioscleave-house-lifespan-extending-villa>

The digital move

During the last decades of the 20th century, digital technology, in general, and its computer-steered options started to act in a more significant, envisioning role. In 1996, Marcos Novak wrote, in an article for CTheory called “Transmitting Architecture; the Transphysical City”: *“In this effort to extend our range and presence to non-local realities, architecture has been a bystander, at most housing the equipment that enables us to extend our presence. The technologies that would allow the distribution or transmission of space have been unimaginable, until now”*¹⁸.

An interesting, though primarily theoretical, project took place in 1997, initiated by the Anyone Corporation. It challenged seven architects to design a “virtual house” and questioned whether it was possible in the first place to translate the abstract into actual developments¹⁹. More concrete, in 1997, Dutch architects Kas Oosterhuis and Lars Spuybroek both realized a section of the “[Water Pavilion](#),” not a house but a visitor’ center that is part of the innovative protective waterworks in the western sea-shored Netherlands. It illustrates the forces/moods of water by creating an interactive interior space that “changes” while moving through its space. In 2004, Lars Spuybroek and sound-engineer Edwin van der Heide created the “[Son-O-House](#)”; a synthesis of space, architecture, and sound in which the computer plays a significant role in design and sound. Spuybroek strived *“to create a proto-house, not a house with all the rooms and furniture, but ‘a house as a place in the world’, a house that everybody could enter and live in, act, move, have feelings, leave traces, connect to previous ‘inhabitants’”*²⁰(sic.).

More spatial as well as ephemeral in its architecture, was Diller Scofidio’s (2002) “[Blur Building](#)” for the Swiss Expo in Yverdon-les-Bains. Their *“objective is to weave together architecture and electronic technologies, yet exchange the properties of each for the other.”* Later projects were sometimes stand-alone art projects first, researching spatial experience and the optional (accompanying) technologies: e.g., Daan Roosegaarde’s early “[Lotus Dome](#)” project consisted of a “living dome made out of hundreds of heat sensitive smart flowers which open in response to human warmth and light, creating an interactive play of light and shadow.” [Tomas Saraceno](#)’s work was presented at the Venice Biennale in 2009 where he created an “astronomical” web above ground, questioning what constitutes architectural structure. “[Hylozoic Ground](#),” created in 2010 for

¹⁸Novak, M. (1996). Transmitting Architecture; the Transphysical City.

¹⁹See, e.g., Beckerath, V. (1997). Any Thing Goes, the virtual house. *Archis*, 6, 59–61.

²⁰Spuybroek, L. (2009). *The Architecture of Continuity*. NAI Publishers.(p.169)

the Canadian Pavilion at the Venice Biennale by Philip Beesley consisted of a technological/artificial forest, a poetically shaped web hanging from the ceiling made of acrylic wires and connected whiskers, providing an interplay with visitors: glowing, reacting, withdrawing and approaching.

In 2008, Usman Haque, Adam Somlay-Fischer, Ai Hasegawa, and others created their “[Reconfigurable House 2.0](#).” As described on the website²¹:

“The Reconfigurable House is an environment constructed from thousands of low tech components that can be “reconfigured” by its occupants. Any sensor/actuator can be connected to any other sensor/actuator – it is the occupants of the house who determine the systems that run inside it. Constructed at ICC in Tokyo, Japan, and open to the public until March 2008, the project is a challenge to ubiquitous computing “smart homes”, which are based on the idea that technology should be invisible to prevent DIY. Smart homes actually aren’t very smart simply because they are pre-wired according to algorithms and decisions made by designers of the systems, rather than the people who occupy the houses. In contrast to such homes, which are not able to adapt structurally over time, the many sensors and actuators of Reconfigurable House can be reconnected endlessly as people change their minds so that the House can take on completely new behaviors.”

With the latter statement in mind, facilitating “completely new behaviors,” it is essential that the environment provides the proper framework. It is therefore remarkable that many of the (even early) projects – see, e.g., le Corbusier, Teige, Friedman, Constant, Habraken – referred to focus on the principle of main (common) structure and personal infill. This is/remains in fact a returning theoretical principle over the last decades, however, rarely practiced and above all realized.

Why?

Although brief and incomplete, this summary already shows the wide variety of projects by a likewise variety of artists/architects, sometimes socially motivated, sometimes artistically, technologically, or otherwise. Also, the differences occur primarily within scale and sphere, i.e., some concerned the individual (housing)

²¹<http://www.haque.co.uk/reconfigurablehouse.php>

space, some emphasized basic structures; some were devoted to frameworks creating freedom while others caused (at time unintended) restrictions or limitations. What, if any, is their binding factor; what is their common goal; what is aimed or searched for; and why are these early projects almost never realized and the more recent ones often neglected or even ignored? Just stating that they were the product of creative and visionary minds and served no other purpose than to act as thinking project does not do justice to the serious intentions (e.g., Constant worked on his New Babylon for almost 20 years and maintained that his project was technologically achievable, and the members of Archigram demonstrated their thoughts and works broadly in educational and exhibition projects) in trying to find answers to situations or developments that were in serious need of open reflection and fundamental rethinking.

While many projects were structured around what could rather philosophically be described as Leo van Broeck's question of "the spatial presence of human species on earth," for most of the examples mentioned above, the primary thought behind them was – most probably – not a rational one; in particular, the more recent projects are, above all, creative, imaginative projects; i.e., the search is for other, more abstract values besides solving a technical and/or social issue only with the knowledge that technological innovation made these projects realizable. It was a creative rethinking of a concept for living in a changing world. The periods in which these projects were envisioned often required the innovative powers of others than architects only; like in today's times man needs all the creativity and imagination, we can mobilize to search for an appropriate synthesis of art, technology, and society. For example, Daan Roosegaarde refers to many of his projects as "techno-poetry"; thus "connecting people and technology in artworks." When stripped of its technological framework, the "profit" is not a project/product only but a system, a frame, a (pre)condition, and a possibility for additional experience, for witnessing the unexpected and for envisioning environments with the help/use of innovative technological developments. Technology, in [Bernhard Stiegler's](#) phrasing, is a "*pharmakon*"; i.e., it can serve as a means to improve or it can serve as a means to destroy. Looking at today's world and, above all, trying to anticipate and think tomorrow's, with its rapidly developing technological innovations as well as its environmental and political problems, it is unavoidable as well as understandable that there is a call for a new utopia, for a real paradigm-shift in how we envision our "place on earth." Where Constant was well aware that technology in his time was not adequate enough to facilitate/realize his project, today, we can no longer argue that a lack of technological options and innovations stands in the way of any real change. Increasingly, technologies like, e.g., Internet of Things/People and Artificial Intelligence compel us to consider their and our role as well as their impact on our life, while, at the same

time, remember [Jaron Lanier](#)'s statement: *"It's only human choice that makes the human world function. Technology can motivate human choice, but not replace it"*²².

Early projects (e.g., Ivain, Friedman, and Constant) already emphasized the options and possibilities for inhabitants to adapt or modify their environment and to incorporate citizens in the systems of building and modification. Throughout the recent centuries, innovative technologies have facilitated building developments that were not possible before; e.g., the invention of the first "safe" elevator in the mid-19th century made high-rise buildings realizable, Oosterhuis'/Spuybroek's Water Pavilion is designed around new digital developments. Technology, however, can also provide the ways and means to increase or improve our democratic processes; when focused on our housing – and therefore private space/spatial privacy – it can result in a more participative role over what constitutes private space. It implies, however, that the inhabitant has control over what constitutes this space, over the part that controls relevant systems and infrastructure as well as over generated (personal) data. In Constant's phrasing: *"One could call New Babylon the absolute 'Gesamtkunstwerk', the synthesis of all human activities, society as a work of art, the city of the technical mass man, the human being in the unemployed era"*²³.

Traditional housing was – and in part still is – a way/method to answer our basic need for shelter first; (recent) history in this tells us that, while this need is persistent, it is also accompanied by the increasing possibilities for enhancement and for extended experience. Technology also provides for the expressed desire of participatory activity in creating, designing, and maintaining our (built) environment, one that also serves as the primary element within the actual move to a really smart, participative city. As, however, various earlier projects have showed, so-called "smartness" comes close to control, surveillance, and, in fact, restricted freedom. Constant, while always stressing that he only made suggestions for a future world – *"the environment is created by the activities of life not the other way around"*²⁴ – ultimately finished his work on New Babylon because in the end, he could no longer envision man in his envisioned environments.

²² Lanier, J. (2010). *You Are Not a Gadget: A Manifesto* (Vintage). Vintage. (p.240)

²³ Constant in het Nieuwsblad van het Noorden, 23-7-1966

²⁴ <https://stichtingconstant.nl/new-babylon-1956-1974>

In a recent essay as well as in an extensive interview²⁵ in the weekly “de Groene Amsterdammer,” Dutch Chief Government Architect (Rijksbouwmeester) Floris Alkemade criticizes policy makers and politicians: *“As if the country is handed over to myopic accountants, who built up a completely distorted picture of efficiency and cost control from a straightforward point of usefulness. Everything is subjected to painstakingly substantiated arguments that, even if built on quicksand quickly provide a chine of exactness in all their abstraction”* (transl.mp). He calls for change, for a more extensive discussion on housing as well its framework, for more imagination, and for more dreams. Apart from the much-needed awareness that technology has its influence on an individual scale – see Chapter 10 – there is the collective contemporary urge for freedom, the freedom to be able to envision and realize the (built) environment man needs. As Paul Mason argues, *“The networked individual may be oppressed, harassed, crushed down by circumstance. But the life they are living – simultaneously empowered and manipulated by technology – contains the seeds of a project of human freedom based on overcoming this alienation and self-estrangement”*²⁶. The contemporary question therefore is how nature, architecture, and (digital) technologies can merge in such a way that the result facilitates as well as enhances the spatial options for required freedom, i.e., dwelling understood as “being at peace in a certain place, at a certain time.”

First, I will discuss the “architecture,” the primary adaptation of space to facilitate housing.

²⁵<https://www.groene.nl/artikel/alsof-het-land-is-overgedragen-aan-bijziende-accountants>

²⁶Mason, P. (2019). *Clear Bright Future, a radical defence of the human being*. Allen Lane.(p.205)

At the CIAM-congress in 1928, architecture was considered a profession that searched for a primarily rational approach of the urban and housing problem; i.e., an emphasis on economy and efficiency. In the words of Matthew David Allen: *"It was only after technological progress had been identified as an inevitable process that the solution to the problems created by rationalization (of industry) could be sought through more rationalization (of architecture and finally of society)."*¹ The vision of architects at that time and for a long time to follow was to think of a new utopia, a world that may be alien to many at first but, in the end, was to be considered the best for society. Man would find his new home that will result in a new man, hereby assuming that the world and society can be made in line with its architecture. In their "La Sarraz Declaration"¹ (supposed to be written by le Corbusier), two lines remain interesting given today's situation: "The destiny of architecture is to express the orientation of the age. Works of architecture can only spring from the present time."

5

Architecture; home, from the surface

‘Architecture is a set of highly provisional “solutions” to the question of how to live and inhabit space with others’¹.

Elizabeth Grosz

“Architecture, along the principles of functionalism, programmatic determinism and technological expressionism, produced buildings without connection to site, place, the human being and history”².

Karsten Harries

Definitions sometimes tend to cause confusion since they can be explained entirely differently when utilized within other disciplines. Architecture, searched for on, e.g., the EC-Horizon 2020 website primarily brings to the surface a series of documents linked to digital infrastructure. In these texts, however, the topic is a more spatially oriented one that nevertheless does not disregard its – by now close – link to increasing accompanying digital (infra)structures. For these texts, I will use a widely recognized and accepted definition: architecture is the adaptation of space to human needs. To add, not to be regarded as solely physical building but paraphrasing [Rainer Banham](#)’s words: it is about how it is done, not what is done. This, therefore, does not exclude any means non-physical; in the earlier words of [Henri Lefebvre](#), it is “*the production of space at a specific level*” that includes other means or “levels.”

¹Grosz, E. (2001). Architecture from the Outside: Essays on Virtual and Real Space. The MIT Press.(p.148)

²Harries, K. (1997). The Ethical Function of Architecture. MIT Press. (p.7)

While (re)thinking architecture, we consider the conditioning of the environment for human habitation. When envisioning architecture, from its initial thought on, we decide on a (natural) site, a place, a location, a situation composed of more or less adequate circumstances. This is already a choice steered by series of real and/or envisioned frameworks, i.e., urban development: required or necessary infrastructure, surrounding urban facilities and plans, local transport, and municipalities involved. Also, the choice involves historic factors: do we (ever) start from a *tabula rasa*, do we build on previous architecture, is the location really natural, or is it culturally determined? From the moment we have decided for a location and its initial transformation and/or adaptation started, the final architecture is decided, usually for the rest of its existence. This is, in particular, true for our housing; apart from a minor group of people who can afford to build their own house on a location of their choice, the majority of – ultimately – inhabitants has a choice envisioned, predetermined, and planned by the process described above. We choose out of what is or will be built; only to a minor degree can we really influence and participate in what is to be realized. However, in particular, in a world rapidly transforming into a hybrid world, we can only participate if we take back “control” on each and every level of civil participation.

After we have “*extracted architectonical space as an emptiness out of natural space*,”³ we create a physical framework that provides the precondition for a house, to become a home, i.e., lived space. At its initiation, the framework is provided by a set of rules, a series of (social, legal, and technical) guidelines that describe and frame the spaces to be built. We have also decided on the parameters that determine what this house will look like, how it is to be used, and how it is to be experienced; in brief, how third parties – besides the inhabitant – envision an important element to frame our “life on earth.” These parameters, by now, include a series of measures to provide each house separately with an inner atmosphere that isolates and creates a sphere that has no immediate relation with the natural world outside; we install systems to heat and/or cool, we install double glazing, we insulate our walls and roof, and – more actual – we provide this space with an increasing amount of random technology that is supposed to make our (domestic) life more convenient and comfortable. Our individual house has become the protective cell that isolates us from the world outside: in atmosphere, sound and smell, wind, water, and rain.

We do not build *with* the world; we have – literally – locked out all options to adapt to changing circumstances, to shifting needs, to other spatial experiences where it once was the answer to a series of rational questions only. Architecture is experienced by moving through the created space it frames. At the same

³Laan, D. H. van der. (1983). *Architectonic Space*. Brill Leiden.

time, this experience is static, i.e., the built environment is what it is when it was completed; it does not facilitate additional (imaginative, sensorial) experiences. Architecture, in the words of [Peter Eisenman](#), is no longer “the record of a process but the end result of a process.”

The definition as described above – i.e., architecture is the adaptation of space to human needs – implies at least two issues.

The first – the adaptation of space – does not exclude ways and means other than physical, i.e., the adaptation is not necessarily a “permanent” one. In that sense, Lefebvre’s definition – “*at a specific level*” – is more open and more abstract; open attitude and technological developments raise the amount of “levels” available for experience.

The second – human needs – implies that we are aware of these needs, we acknowledge them, we understand them, and we are capable of translating these into adequate spatial/architectural solutions. Human needs though are not uniform, standardized, or individually determined; our lives are not the sum-total of a series of behavioral characteristics, individual habits, and personal data. Since, however, our traditional current system of building houses implies that we cannot translate everyone’s needs into individualized spatial solutions, we have framed this within uniformed regulations that provide some sort of average “solution” suitable for uniformed inhabitation. The result is a system that functions as a straightjacket, producing an architecture that can only be “personalized” by cosmetic choices and leaves the “*homo faber*” – the craftsman – useless during the building process since his/her profession is restricted and reduced to producing standardized works in large series and/or volumes. The entire system is of a linear principle and process: we envision and create individual housing projects, all with their own completed architecture, characteristics, and details; we prescribe materials, utilize them once, and ultimately dispose of them. Where “*Architecture ought to be designed for actions it invites*”⁴ as argued by [Shusaku Arakawa](#) and [Madeleine Gins](#), now there is no flexibility, no movement, no principle of circularity, no standardization, and no industrialization: hence, no freedom.

As involved and participating citizens we become more and more aware of the increasing variety of options we have to design and create our immediate environment. Some 3D software programs are available for free and easy to use, and more and more manufacturers and retailers offer options to envision and create

⁴Gins, M., & Arakawa, S. (2002). *Architectural Body (Modern & Contemporary Poetics)*. University Alabama Press.

one's environment, be it interior or exterior. Nevertheless, as long as our housing is envisioned and realized by commercial parties who still fail or are unable to connect their digital spaces to those of the participating citizen, the cooperation will be limited to cosmetic elements.

So far, we leave it up to third parties to decide *for* us instead of *with* us what the built environment should provide, facilitate, or look like. This goes hand-in-hand with the demands and needs as well as (technological) possibilities for more democratic processes when it is about shaping our neighborhood, our lived space, and the means/ways we possess to realize this. Industry provides standardized and/or modular solutions since decades; when it comes to housing, the lack of possible options within used frameworks prevents utilization. Where our housing could very well provide and accommodate systems of infill, their basic structure as well as entire scale prevents the use of modular systems, be it for interior frameworks or infrastructural purposes. Since regulations, followed up by municipalities, architects and project developers dictate the typology we feel committed to the use of fixed materials to realize this; changing this implies the demolishing and destruction of materials where flexible, standardized, and prefabricated systems will last for decades, serving the same purpose.

As [Lara Schrijver](#) so adequately concludes while discussing Constant's project: *"The project New Babylon could not have been created without a deep sense of the power of architecture to transform the lives of its occupants. (...) Perhaps this is why we continue to revisit the '1960's: it offers us a sense of true agency in architecture - the possibility that we may, with a simple plan for a new form of housing, alter the world a fundamental way, contributing to a quicker realization of the better future that lie just ahead"*⁵.

As argued before, it is hardly realistic to provide everyone with the full range of options and possibilities to create one's own (urban) habitat or lived space. Our housing is an integrated part of a society, municipality, or community: "systems" with their own — often specific — political and social structures. The scale of housing needed to accommodate everyone, in particular, in cities does not justify separated individual solutions only, which of course does not imply that individual creative solutions should be discarded completely. A recent example in the Netherlands where a group of people could create their own house but were also made responsible for the necessary infrastructure such as electricity, water, and sewage systems illustrates the dilemma: unavoidable, important structural systems like these belong to the responsibility of the municipality and not of the individual inhabitant. What is in everyone's interest, i.e., "common"

⁵Schrijver, L. (2009). *Radical Games, Popping the Bubble of 1960' Architecture*. NAI Publishers.

should remain common, owned, and maintained by all of us; hence, the municipality. Within the “definition” given above – architecture is about the conditioning of the environment for human inhabitation – it is the “conditioning” that prevails; further articulation is upon the inhabitant.

Ruud Welten once argued that “*building a house is always an act of violence. One appropriates a place that one denies another*”⁶ (transl.mp). This raises the following inescapable question: to what extent is our built environment “owned” by the commons, what is “owned” individually, why and by whom? If we conclude that infrastructure is owned and maintained by the commons, why is the built infrastructure and the framework for housing not owned by the commons, and why not the land? The grounds belong to all of us, as urban designer/architect Lotte Stam-Beese argued back in the 1960s. Fact is that since land and grounds are for centuries now the subject of trade, its price is subject to speculation, thus increasing or decreasing the ultimate price of everything that is built upon it. Together with the current system of providing housing, i.e., as a commodity, a market-product to trade, we end up with a system of housing supply that is expensive, rigid, and inflexible, causing much waste and is hardly an example of innovative processes and technologies⁷. Today, it is the ever undemocratic and inadequate answer to a question unknown. Since our housing is a vital element on the crossroads of the roof over our head and the increasing technological options, the latter cannot be excluded from the options available.

In Brian Massumi’s critical and decisive phrasing: “*To build in Euclidean space is to build in predictability. (..) a building is a membrane*”⁸. Thus, the built environment, in particular concerning housing, should be thought of as a participatory, flexible, and adaptable system, not some static entity fixed for decades and centuries to come – a system designed and raised for a variety of functions, options, and actions, a system that incorporates infrastructures, be it digital or analog, providing agency and participatory action. In the descriptive words of Bernard Cache: “*Architecture would be the art of introducing intervals in a territory in order to construct frames of probability*”⁹.

⁶Welten, R., Borges, J. L., & Theseus, A. (1995). HET OPEN HUIS, Emmanuel Levinas en het wonen. Genesis, 1–6.

⁷The construction sector is among the least digitized: see <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/imagining-constructions-digital-future>

⁸Massumi, B. (2002). *Parables for the Virtual: Movement, Affect, Sensation. Postcontemporary interventions.* <http://doi.org/10.1215/9780822383574>

⁹Cache, B. (1995). *Earth Moves: The Furnishing of Territories.* The MIT Press.

What is needed to provide “frames of probability,” and what is needed to facilitate the preconditions for spatial privacy, for lived space? If the answer to this question is a complete separation of individual private space within common public space to ensure that every citizen can live a life in an expected seclusion, in the knowledge that he/she is protected by law without the latent awareness that this is an illusion, then we can proceed as ever before, i.e., building houses. But the “adaptation of space to address needs” does not imply that we should dismiss of what Genevieve Bell and Paul Dourish refer to as “messiness”; it does not imply that we should not facilitate disorder, uncertainty, unpredictability, and choices. It does, however, imply “probability,” i.e., recognizing, acknowledging, and, above all, facilitating independence, civil participation, and individuality.

While building our current housing, the majority of work, logistical, and technological effort is committed to the process of creating something “final”; a fixed shell that – due to reasons of costs and economics – is reduced to an artificial, inert built environment. When we take a close look at the result, we witness a product that usually lacks creativity, imagination, and joy, and, more importantly, lacks the options for inhabitants to add theirs. Individual choices and/or preferences are often rejected: they “disturb the process”; they “do not fit the overall design picture” and disregard the envisioned (esthetic) image/unity of the entire project. When we realize that it is this built environment that is the primary place on earth where we spend a great deal of our lives, we should also realize that it therefore needs all ways, means, and options to add value to those lives. This implies all beyond the “conditioning” – i.e., the overall facade or framework that separates inner from outer space – which is primarily a technological issue, to be addressed by technologists in close corporation with an urban designer and/or architect.

The primary question that evolves out of this separation of responsibilities and tasks is who is responsible or addressable, and for what? If we leave the design of housing to individual inhabitants, we will not end up in total chaos; we will – within common frameworks – transfer the design and use of private sphere to the ones using this sphere. As [Henk Oosterling](#) phrases it in his Premsele-lecture¹⁰ back in 2009: *“Our daily life is fully designed. (..) Problematic because the innovative role of designers seems to have been played out. They disappear as a mediator in a networked society. If everyone is a designer and our Dasein has become all design, the designer is everywhere and nowhere. (..) In Japan, design does not relate to the avant-garde, but to life as art, to the arts of life. (..) Life and design – i.e., in Japan, mp – relate as nature to art”* (transl.mp).

¹⁰Oosterling, H. (2009). Dasein als design. Premsele.

Idealistically, one could envision a “networked” world in which the inhabitant is the “designer” of his/her sphere, exclusive being that part of the environment that is the “commons.”

On this larger scale, our house/home still is the private part of the public sphere; both are increasingly developing into a “smart” environment that makes no distinction between both spheres. In his recent book, [Richard Sennett](#) distinguishes two types of “smart cities”; the prescriptive smart city that “*does mental harm; it dumbs down its citizens*” and the coordinating smart city that “*stimulates people mentally by engaging them in complex problems and human differences*”¹¹. The first is referred to as “*closed*,” the second as “*open*.” If we seek for a city that is inhabited by participating citizens that exercise their agency, we need to incorporate a built environment that “stimulates,” as a valuable prerequisite for acting as such. In a world that increasingly transforms into a networked world – including the built environment – there is no single entity that “controls.”

First though, the next chapter will present and discuss our housing within its framework of process and product.

¹¹Sennett, R. (2018). *Building and Dwelling*. Allen Lane. (p.144)



'Spectre', (front view) by Marwan Rechmaoui, 2006–2008, (photo Agop Kanledjian)

6

Housing, system and principles

“How can the new tools available to the architect bring people together - not only inhabit, but to change, augment and ultimately create the environment around them?”¹

Carlo Ratti

“There is no completely rational space, no completely adequate place, and the alternative between topia and utopia no longer defines our possibilities.”²

John Rajchman

“Housing scarcity in the Netherlands is no longer a matter of long waiting times for a suitable house, but a rat that gnaws at the autonomy of the citizen. The failing housing policy of the last decades forces an increasing number of Dutchmen to choose between several evils: homelessness, a goodbye from the city and the social environment, moving in with family, divorces, postponing, etc. Practices that throw the free individuals of the 21st. century back to the circumstances and culture of a hundred years ago.” (transl.mp)

Erdal Balci, de Volkskrant Jan. 28th. 2019

¹Ratti, C. (2015). *Open Source Architecture*. Thames & Hudson.

²Rajchman, J. (1988). *Constructions*. MIT Press.

As emphasized in the introduction: these texts “build” on the situation of housing in the Netherlands and, in particular, where it concerns the numbers, this will of course not always be fully comparable or in line with other European countries. Nevertheless, I believe the main principles do not vary that much insofar it involves the theory and practice of building housing behind.

First, allow me to present a few illustrative numbers and elementary statistics.

Recent research concludes that in the Netherlands, today, all together some 7.740.000 houses are realized: this number is divided into single-family houses (about 65%), apartments, and a minor number of other typologies. The majority is built after World War 2 – some 6.2 million. Around 450.000 houses are built before 1905, hence, over one hundred years old. The average “age” of our houses built after 1900 is 38 years³. With an overall population of almost 17 million people, less than half of our housing is rented; about 70% from housing corporations and about 20% from other owners/investors. Slightly more than half of our housing is owned; its total number is increasing.⁴ The total number of rented housing is decreasing for years now, including the share of corporations.

A greater number of tenants want to (re)move compared to owners; also there is a major discrepancy between those who wish to move and those who, in the end, actually do. In particular, those who wish to buy experience increasing difficulties in finding what they wish or need, with a clear emphasis on the larger cities in the west⁵.

The number of people moving to another house is increasing since the last 10 years; motives being primarily – 34% – the house itself. Other reasons such as environment, work, family, or study are far less important. 3.2 million households indicate that they wish to move within 2 years’ time; in 2009, this number was 2.1 million. The complete building sector contributes to about 4.5% of the GDP, and roughly 40% of this number concerns housing. Works in the sector cover around 60% newly built and around 40% renovations. About 6% of all buildings – 71 million m² – is empty, 27% of which – 11.5 million m² being about 19% of all – concerns office buildings.

³<https://www.cbs.nl/nl-nl/nieuws/2000/04/woningen-gemiddeld-38-jaar-oud>

⁴https://vois.datawonen.nl/jive/jivereportcontents.ashx?report=home_new

⁵<https://www.pbl.nl/sites/default/files/cms/publicaties/verhuiswensen-verhuisgedrag.pdf>

Recent research⁶ states that between 2018 and 2030, the number of houses will increase by 770.000 (i.e., 930.000 newly built minus 159.000 demolished), and, by 2030, shortage will be decreased to 200.000.

At the same time, the houses we build will be a reality for at least 120 years, sometimes even more⁷. The average occupation period is 7–10 years, implicating that whatever we build is an inadequate answer to a question unknown. Since nobody will seriously pretend to know what the world will look like in, say 25 years, it seems quite pretentious to continue building houses the way we do in preparation for a lifetime of more than a century. The system of providing and building certain prescribed types of houses is also one cause of the lack of adaptability; i.e., there is no flexibility and no option for real change. The entire system is envisioned to function within a process of changing locations/places, i.e., we start in small apartments and move on to single-family houses to “end” again in a small apartment, with minor variations in between; all together a flow system that too often functions poorly. In the Netherlands, we, therefore, often speak of a “housing career,” referring to the various houses we occupy and their periods of inhabitation: we move, on average, about seven times in our life and this number is increasing over the decades. Although I have indicated that I will proceed from the situation in the Netherlands, it is interesting and illustrative to refer briefly to the one in Belgium where, historically, the ownership is envisioned at 70%, leaving only 5%–10% social housing and a minor percentage of private rented housing. A recent initiative to seriously address this situation could well result in a lawsuit before the European Committee of Social Rights⁸.

Back in 2012, a group of organizations consisting of consumer organizations as well as real-estate developers concluded in their “Housingmarketplan” ([Woningmarktplan](#), Wonen 4.0) that “the current housing market no longer meets today’s requirements”; briefly:

- The market is not flexible enough; preferences of consumers/inhabitants are not sufficiently taken into account.
- Too much costs and too much risk.
- Loss of prosperity; not enough choice and not enough chances for “starters.”
- Not enough market forces on the supply sides; not enough demand driven.

⁶Gopal, K. et al. (2019). Socrates 2019 , scenariooverkenningen van de woningmarkt in 2030.

⁷<https://www.vastgoedactueel.nl/nieuws/'levensduur-woning-minimaal-120-jaar'>

⁸<https://www.mo.be/interview/vlaams-woonbeleid-naam-beleid-niet-waardig>

Needs and numbers

In a Dutch daily newspaper, the current housing situation was recently qualified as a “drama”; without neglecting or downsizing the existing real problems for many people in obtaining a house, I still consider this a somewhat unduly phrasing. It is primarily a real drama for those – by now about 40.000 and counting – who are forced to live “on the streets” for whatever reason since we fail to accommodate others besides the ones fitting the traditional citizens/inhabitants profiles. Building housing is, due to its implications for society and the environment as well as (local) government, therefore also a most relevant political issue. Illustrative is also Article 22.2 of the Dutch Constitution: “Promotion of sufficient housing is the object of government concern.”⁹

The current shortage is estimated between 331.000 (Rijksoverheid, 2020) and 315.000 houses (Rabobank, 2020), depending on the definition of this shortage. The usual way of defining is to compare the number of households with a registered address to the existing number of housing. The overall number is also influenced by the fact that many young people tend to stay with their parents, given the lack of adequate housing as well as people living on recreational sites – around 70.000 – which is, in fact, lawfully not allowed but sometimes tolerated.

The Dutch government states these days that about 20.000 houses need to be replaced each year due to their neglected/outdated condition and about 75.000 houses need to be built each year to answer the demand. Organizations that are devoted and/or committed to building communicate a higher number. At the same time, this number will decrease up to 2030 to an average 20.000; the average household size will have been decreased from 2,3 persons in 2005 to 2,1 persons in 2030. With the life-time of a house in mind – at least 120 years – it implies that what we estimate, plan, and built now most probably will no longer be an adequate answer in 50 years from now. This is also influenced by the fact that between 2040 and 2050, the Dutch population no longer will increase significantly.

According to research, the emphasis in building should be on owner-occupied homes and medium-priced rental homes. The costs, however, of building houses have since 2015 increased by 27% and, in 2018 alone, by 9%; to a large extent, the result of additional regulations concerning topics like technology and

⁹https://www.denederlandsegrondwet.nl/id/vgrnbtnluowp/artikel_22_volksgezondheid

sustainability. Recent (Dutch) statistics¹⁰ show that our newly built housing was, in the third quarter of 2019, about 38% more expensive compared to the same quarter five years ago. The average price of a newly built house is now approximately €325.000 (May 2020); together with the possible mortgage percentage therefore only in reach for the ones who either have (sold) a house or otherwise have external finances. This more or less excludes “starters,” also the category that is usually in no need or position (yet) for a one-family house but primarily for some form of rented space to live independent, to be extended/adapted when the personal situation requires change. This again is caused by the fact that what is delivered is a complete and finished house, not a framework for further (personal) infill. To a large extent, this is caused by (building, technology, and sustainability) regulations together with the “principle” of selling/providing an individual house with all functionality “needed” instead of sufficing with its preconditions, thus leaving the ultimate choices to the inhabitant.

Again, the entire situation of our housing requires a flexible approach as well as a flexible system to be able to adapt to unknown future demand and social developments.

System

The current system, in practice after World War 2, consists of mainly two processes: the “rented” social housing supplied by housing corporations and the “owned” housing supplied by project developers. A minor amount of housing is built as a private project, i.e., without both parties mentioned above, as well as a minor number of CPO-projects. After World War 2, about 60% of housing was “free rent”; last year, in 2019, this was reduced to 10%. The entire situation caused one journalist in a Dutch newspaper to conclude that “*the Dutch housing market is as bad as a medlar*”¹¹ (transl.mp). In this, he joined a number of expert writers who criticized the current situation for a variety of reasons. Bottom line, however, is the fact that, for decades now, the way we organize and build our housing is subject for fundamental critique, for a variety of reasons. Additionally, we fail to provide proper housing for groups of people who do not seem to fit into the traditional system: e.g., last year in the Netherlands alone about 40.000 (registered) people were

¹⁰<https://www.cbs.nl/nl-nl/nieuws/2019/51/koopwoningen-bijna-6-procent-duurder-in-november>

¹¹<https://www.volkskrant.nl/economie/de-nederlandse-woningmarkt-is-zo-rot-als-een-mispel~beb21df4/>

homeless¹², with an increase of 74% between 2009 and 2015. (Note: the estimated number in all of Europe is about 410.000 people sleeping on the streets of European cities and 3 million homeless all together.¹³) This, of course, is not primarily caused by a lack of traditional housing first, but it is the consequence of the lack of elementary shelter/housing options provided within the current system of our built environment. Given the UN Declaration of Human Rights – i.e., everybody has the right to a roof over his/her head – this situation is most tragic and most of all in fact unnecessary (see also later in this chapter).

The building chain consists of a series of partners: the owner of the lands, the municipalities, the project developer, the architect, the builder/(sub)contractor(s), and – ultimately at the far end of the entire process – the inhabitant. Where it concerns the rented (social) housing, it is the corporation that is “responsible” for developing, building, and maintaining these houses. It seems relevant to mention the current attitude by some municipalities as well as project developers to wait – given the shortage on the housing market – and allow the price of land (the total amount of which will, without envisioned future extensions offshore, remain the same) to increase. Together with the increasing costs¹⁴ of building housing the way we continue to do, this implies that for many people who wish to buy their first house (“starters”), it has become practically almost impossible to obtain one. It comes as no coincidence that, e.g., in Germany, we notice a recent statement by (SPD-politician) Kevin Kühnert that houses should only be owned by the one who lives in it¹⁵; a statement recently adopted by the cities of Amsterdam and Utrecht, mainly though for houses yet to be built. Parallel with this, there is the increasing topic of what is often called “Generation Rent,” a plea for a thorough rethinking of the principle of ownership of housing in favor of its rent/use.

Illustrative for the existing policy and current problematic situation is a recent statement made by the CEO of one of the largest Dutch building companies: “*we simply have to develop and build houses first, before we can sell them*” (transl.mp), implicating that developing and building houses is still considered a (commercial) market system and thus reserved for third parties, not for a participating

¹²<https://www.cbs.nl/nl-nl/nieuws/2016/09/aantal-daklozen-in-zes-jaar-met-driekwart-toegenomen>

¹³<http://www.home-eu.org/homelessness/>

¹⁴Recent research concluded that the increase of costs is due, e.g., to innovative technological demands.

¹⁵https://www.focus.de/politik/deutschland/kommentar-kuehnert-macht-sich-mit-sozialismus-ideen-laecherlich-und-erweist-spd-baerendienst_id_10657766.html

inhabitant. Houses are considered a commodity; it is a process as well as a product completely disconnected from its user. It is, therefore, illustrative and encouraging that an increasing number of people is searching for other solutions besides the traditional ones, i.e., they take the initiative to organize themselves in cooperation or associations of inhabitants that plan/design/build their own housing project. Today's reality, however, is that current regulations, bureaucracy, and, in particular, the necessary plot of land create a barrier between good intentions and ultimate result: there is simply no level playing field.

As early as 2004, John Habraken concluded in an extensive STT-report: *“Not one of the parties that take care of the process of building housing sees any advantage of delegating design competence to the inhabitant. As long as there is a shortage of housing there is no pressure to admit the user. With this the shortage is in fact institutionalized.”*¹⁶ (transl.mp) What is created and still in use is a system in which the inhabitant – be it the first or any next – has no real and lasting influence on what is one of the most vital and important (pre)conditions or entities in his/her life, i.e., the house. What is subject to market values, rented, or sold is some physical entity: a house, not its framework for a home. What is rented or sold has become part of a market with its own dynamics, with its own “(neo)liberal values,” as well as its own lack of human values.

Habraken argued much earlier in 1972: *“if we wish to restore just the human relations in the housing-column, but do not wish to exploit the technological options of today, we only leave the way to the past, a way we cannot go.”*¹⁷ (transl.mp) Extrapolated by me nearly 50 years later: the technological options of building our housing today seem to be restricted to the builder; the inhabitant is left with ways and means that serve cosmetic and/or comfort issues. The “way we need to go” is one that brings real innovation into the design and production process as well as in the building process, resulting in an innovative product that answers the needs of inhabitants; not only the first but also up to the last during the lifecycle of the building. This is outlined in, e.g., Habraken's “Open Building” theory¹⁸ and presented in more detail in various texts and projects over a longer period of time. For those who still believe that this entire issue and discussion is a recent/new one, remember and (re)read what the Dutch Ministry of Housing, Spatial Planning and Environment (liquidated in 2010) wrote already more than 25 years ago in 1994:

¹⁶van Well, M. (Ed.). (2004). *Beter bouwen en bewonen*. STT. (p.264)

¹⁷Habraken, N. J. (1972). *de dragers en de mensen*. Scheltema & Holkema. (p.129)

¹⁸<https://www.habraken.com/html/introduction.htm>

“Can the new, varied demand for houses be met? Yes, among other things by flexibly renovating houses, every living requirement can be answered. The essence of flexible construction is the simple changeability of the layout and equipment of the home. Flexible building is also designing the layout of houses and the dimensions of the individual rooms so that flexible use of spaces is possible. (...) Architects and builders already have (re) construction methods available that make it possible to market a changeable home product. This includes forms of Open Building: separation of carrier and built-in systems and disconnection of the installations from other components. (...) From a technical point of view, nothing stands in the way of a flexible (re)construction approach.”
Flexibel Bouwen, VROM, 93160/a/1-94, p.3–4. (transl.mp)

Something, however, obviously still is “in the way,” given the actual status of what is acknowledged and encouraged in the above report; apart from only a few innovative solutions such as [Wikihouse](#) (an open-source prefab system) and Solid (prefab system for individual housing), it is the structure and content of the building chain as a whole, together with extensive rules and regulations that serve as a permanent barrier in itself as well as for its ultimate “clients”; i.e., inhabitants.

In a recent extensive article¹⁹ in the Dutch daily NRC, [Peter Boelhouwer](#) argues that it is time for a 6th “Spatial Planning Note” (6e Nota Ruimtelijke Ordening); what we need is a new, broad spatial vision from the National Government, not only for housing but also including energy issues, nature/water management, etc.; a plea parallel to what the Dutch Chief Government Architect Floris Alkemade argues in his latest publication²⁰.

As said in the introduction, this text is by no means to be considered or qualified as a scientific study; it is an attempt to register and align the various technological/digital and social developments, stir up the already ongoing discussion, and cause an exchange of innovative thoughts, ideas, and initiatives that will bring fundamental change, optimistic as this may sound. A large supply of reports from various (inter)national research institutions frame and illustrate the situation, focusing on digital innovation, social/human behavior, or clean numbers. All assume that the ways and means used to facilitate our housing will/should be equal

¹⁹<https://www.nrc.nl/nieuws/2020/04/16/hoe-de-overheid-zelf-de-woningnood-creerde-a3996946>

²⁰Alkemade, F. (2020). *de Toekomst van Nederland*. Thoth.

to what they are now and have been so far since World War 2. The entire process is one of supply: depending on the expected and/or calculated numbers of (future) citizens, we envision, realize, and maintain a market-oriented – read commercialized – system that leaves the inhabitant aside and in the shades. Some building companies do realize that this inadequate situation can and will not last; they shift to other additional ways of ensuring their future “business” as usual but remain part and parcel of the same rigid, traditional system. It is therefore all the more illustrative that in the Netherlands NEPROM – The Association of Dutch Property Developers – in their recent report states that “*worries that, in light of the future, we do the right things. Are we together alert enough on where we should/have to go to proceed with the built environment. We lack a shared image of the future, not in the sense of a blueprint, but of a beckoning perspective*”²¹. (transl.mp)

One could question if, lacking a “shared image of the future,” the goal and work of project developers could be in serious need of a fundamental discussion first on what it means to have a home, inclusive of what this represents or resembles in the networked future. After all, we build for a century at least; as argued before, it seems quite pretentious to add housing to the environment without even an educated guess on what the future will look like in 25 years. It is this “beckoning perspective” that needs to be thought, defined, and properly discussed, in particular, in the widest possible sense: which is the artificial (built) environment that we desire to inhabit, what is the position of the inhabitant, and which is the role technology has in this entire process? What is the role/position of each participant in the chain to ensure that – within a flexible system that serves the inhabitant – all participants needed will be able to function adequately as well as economically and sustainably responsible.

A most relevant issue in this entire discussion is the question “where to build what,” i.e., depending again on the – moreover debatable – number of housing to be realized, there is a difference between building outside or inside existing urban areas. A recent Dutch report²² by the independent think-tank DenkWerk emphasizes that their report “*focuses primarily on (spatial) possibilities to increase the supply of houses (..) towards 2050*” (transl.mp), arguing that only 35% of newly built housing can be realized within urban areas. The latter contradicts research²³ by Netherlands Environmental Assessment Agency (PBL) in 2016; they concluded that about 80% of the need for new housing could be realized within today’s cities/urban structures (within a high-growth scenario until 2050). One could, therefore, question the expressed urgency

²¹https://www.neprom.nl/downloads/neprom/Thuis_in_de_toekomst_Eindrapport.pdf (p.25)

²²DenkWerk. (2020). Klein land, grote keuzes - ruimtelijke ordening richting 2050.

²³Duinen, L.van, B. R. & E. B. (2016). Transformatiepotentie: woningbouw in de bestaande stad.

for building “anywhere,” in particular, outside cities in rural areas, let alone the traditional attitude of the “supply of houses” instead of rethinking this principle. The DenkWerk report also states that more control of the central government – instead of the local one – is needed to continue the spatial development; a statement heavily debated within the (local) institutions. The actual situation in the Netherlands in which envisioned/planned housing (and many other projects) is rejected because of problems concerning CO₂ may result in favor of both Rabobank and PBL-studies; what is essential, however, is that project developers as well as (local) governments stop deciding for others – read involved and participating citizens – on where and how they wish to live and start including (future) inhabitants in this process.

Over the years, an accompanying item/discussion was the envisioned reuse of abandoned buildings; often, empty office or utilitarian buildings. In the Netherlands, roughly 16% of office buildings is unoccupied²⁴; a difference is made in periods of their vacancy. The part that concerns structural vacancy, i.e., unoccupied for longer than three years, is about 65%. The bulk is situated in – the periphery of – the three major cities and is often the property of (real-estate) investors. Recent study by Rabobank²⁵ first concluded that the focus of realizing the housing demand should be with the transformation of areas and buildings; second, 2.1–2.5 million m² office space can be transformed into housing, and with an average surface of 70 m², about 35.000 houses can be realized.

Other system, same product

A recent report²⁶ by ABN-AMRO Bank illustrates other options for building: it – at last – emphasizes the possibilities for modular building (in general) and adds that if the percentage of using this method increases, the amount of housing could rise to 146.000 extra houses by 2030. These developments involve, e.g., a more industrialized process to prefabricate our complete housing, i.e., create/build a house in the factory in large elements, transport these to the building site, assemble and finish with its façade and roof. This, however, is *process* innovation, not *product* innovation. The final product is by no means – other than its production method – a different or even improved result compared to the traditional product. If the (in itself justified)

²⁴<https://www.clo.nl/indicatoren/nl2152-leegstand-kantoren>

²⁵<https://economie.rabobank.com/publicaties/2017/juli/kantoren-omvormen-tot-woningen-transformatieatlas-nederland/>

²⁶<https://insights.abnamro.nl/2019/12/modulair-bouwen-levert-40-procent-extra-woningen-op/>

result of this “innovative” process is lesser costs of producing, it is the manufacturer/building company that profits, not the inhabitant. Responsible, innovative, and adequate systems of modular building in which the inhabitant profits will need to include options to easily adapt and modify common areas, housing plans, and details.

Sometimes now, building/project developers take the initiative to include the *first* buyer/inhabitant to the process of their *first* newly built house. Buyers is provided the option of choosing between predefined variations of interiors, including kitchen, tiles, carpets, etc., defined according to a presumed character, preferences, and/or lifestyle of the inhabitant in his/her home. The arguments communicated are that people have become more prosperous and demanding, and people do not wish to think about the basics of their house and also are supposed to be unable to distinguish a screw from a nail, afraid to pick up a hammer, and incapable of using a drill or a brush. Question here is whether this is true – I do not know of any research made in this – and, more important, whether the project developer is the appropriate self-appointed entity to answer and fulfill these questions and expectations. After all, when the first owner/inhabitant has moved within the 7–10 years’ time, the next inhabitant will have other choices, other tastes, other preferences, etc., i.e., another life. It means that the principles of flexibility and circularity are dismissed from the beginning, discarded after the first inhabitant and therefore never become fully integrated from the start. Providing housing as a framework for homes means providing the (common) structures and resilient facilities for housing, not the building of individual entities that represent only an economic value subject to all anomalies of the market.

Urban economics

This entire range of causes and consequences illustrates the (sometimes conflicting) range of starting points, e.g.:

- Housing, as argued in the previous chapter, is an element within architecture; by realizing this, we add physical objects to common space. At the same time, we create an artificial distinction between what is privately owned and what is commonly used.
- Housing has a lifetime of about 120 years. It is utilized by a series of various inhabitants over this period, which implies that it serves as an integrated part of the built environment.

- Housing will (almost) always rely on infrastructure (water, electricity, sewer systems, etc.) facilitated by the community; again, therefore, part of the (built) environment.

Both raise the question of whether housing, in general, should be subject to discussions of ownership vs. rent; i.e., an element that is such an integrated (artificial) part of the environment may well be no one's or anyone's property. Depending on the country, the situation of ownership vs. rent varies of course, but if we focus on the Netherlands, there is – since decades – the continuing emphasis on ownership, argued by the supposed advantages of personal security, less financial risk, and the feeling that one's house is one's property. Also, there is the issue of quality as is argued by Marja Elsinga and Joris Hoekstra: *“Housing quality is an important determinant of housing satisfaction. The better the quality of the dwelling, the more satisfied the occupant of this dwelling is expected to be”*²⁷. Given the fact that housing is a basic human right, a justified consequence would be that the difference between ownership and rent should not be expressed in quality of the built environment; providing the framework for housing should be envisioned and realized independent of its use.

As former UNHCR Special Rapporteur on adequate housing [Raquel Rolnik](#) analyzes²⁸, since in 2008 the EC issued their *“SGEI”* (i.e., *“Service of General Economic Interest”*) social housing – therefore be based on a maximum income-limit – in, e.g., the Netherlands is considered a means of government-subsidized housing and was supposed/ordered to be brought in line with other European countries²⁹. After objections from Dutch organizations devoted to building social housing and a (legal) discussion of many years, the end result was/is that for several hundreds of thousands families, their housing was not *“market-valued”* and as such became far too expensive for many. In general, on the larger scale: *“the mercantilisation of housing (..) deeply undermined the right to adequate housing around the world. The belief that markets could regulate the allocation of housing, combined with the development of experimental and ‘creative’ financial products, led to the abandonment of public policies that regarded housing as part of social commons.”* (ibid., p.21)

²⁷ Elsinga, M., & Hoekstra, J. (2005). Homeownership and housing satisfaction. *Journal of Housing and the Built Environment*, 20(4), 401–424. <http://doi.org/10.1007/s10901-005-9023-4>

²⁸ Rolnik, R. (2019). *Urban Warfare*. Verso. (p.51)

²⁹ <https://www.housingeurope.eu/resource-487/european-court-objection-housing-associations-to-sgei-decision-manifestly-unfounded>

From the UN website³⁰:

- Half of humanity – 3.5 billion people – lives in cities today and 5 billion people are projected to live in cities by 2030.
- 95% of urban expansion in the next decades will take place in developing world
- 883 million people live in slums today and most of them are found in Eastern and South-Eastern Asia.
- The world's cities occupy just 3% of the Earth's land, but account for 60%–80% of energy consumption and 75% of carbon emissions.
- Rapid urbanization is exerting pressure on fresh water supplies, sewage, the living environment, and public health
- As of 2016, 90% of urban dwellers have been breathing unsafe air, resulting in 4.2 million deaths due to ambient air pollution. More than half of the global urban population was exposed to air pollution levels at least 2.5 times higher than the safety standard.

The Dutch Sustainable Finance Lab (DSF) calculated³¹ that over a five-year period, between 1996 and 2001, the total value of Dutch houses doubled, therefore demanding much higher mortgages for those who could buy and – accordingly – good business for project developers as well as bankers or other suppliers of loans involved. Also, increasingly – good business for project developers as well as bankers or other suppliers of loans involved. Also, increasingly, houses are bought for renting out, causing more shortage and higher prices. In his article³², DSF chairman and economist Rens van Tilburg adequately illustrates the problem and refers to two-track answers (proposed by economist Josh Ryan-Collins), i.e., solutions focused on the banks/financial sector and solutions focused on the housing market and taxes. Since I am no economist and these texts focus primarily on (the architecture of) our housing as such, I will limit myself to the latter, with the addition that one element in this seems worth further rethinking. Van Tilburg concludes that the most fundamental – but hard to achieve – solution is to return the land to the community which will – in part – reduce the costs of building in the first place. This brings another – in many ways – connective element to the foreground, also

³⁰<https://www.un.org/sustainabledevelopment/cities/>

³¹<https://sustainablefinancelab.nl/wp-content/uploads/sites/232/2014/07/SFL-rapport-Een-schuldbewust-land.pdf>

³²<https://decorrespondent.nl/9691/waarom-zijn-huizen-zo-verrekte-duur-en-nog-9-vragen-en-antwoorden-over-wonen-in-nederland/1894992889702-c3dd73d4>

because both are closely intertwined and could be the basics of a fundamental shift in providing housing. Like “the Economist” argued on January 16th 2020 in their article: “Home ownership is the West’s biggest economic-policy mistake”: “(..) *housing policies have made the system unsafe, inefficient and unfair. Time to tear down this rotten edifice and build a new housing market that works.*”³³ The obvious parallel with the Balçi-article at the beginning of this chapter seems worth noting here.

Changing systems, shifting roles

One of the main important principles of rethinking and realizing other ways of building and supplying housing was/is the concept of a split between infrastructure or main structure and infill (see Habraken or Leupen, Constant, and the Metabolists). The “*essence of the concept,*” in Carlo Ratti’s words “*is the separation of the individual from the collective, of the part that changes frequently from what is more stable*”³⁴. Earlier, [John Habraken](#) and, later, [Bernhard Leupen](#) in the Netherlands argued for this same principle, and for good reasons: “*To make a home that can withstand the influences of time, this home must be able to accommodate all kinds of possible future forms of habitation and use*”³⁵. This principle can be exercised in two ways. One is maintaining the separation between individual houses but abandon its specification within, i.e., no predefined plans; therefore primary functions only. Two, the more fundamental way is to abandon the separation completely and provide a main generic structure on a (much) larger urban scale to facilitate any plan or function (see, e.g., Constant’s New Babylon).

It also seems a logical consequence to add the “stable” main structure to the community, for reasons of ownership, sustainability, maintenance, flexibility, and last, but not least, providing lasting freedom for its inhabitants. The question arising of course is if, and if so to what extent the community – be it state, city, or other – is the adequate logical entity to address these questions. As said, building housing is to a large extent also a political issue: in September 2019, it is the Dutch government that takes initiatives to speed up the process of building housing by granting a series of measures that should facilitate and “guarantee”

³³<https://www.economist.com/leaders/2020/01/16/home-ownership-is-the-west-s-biggest-economic-policy-mistake>

³⁴Ratti, C. (2015). *Open Source Architecture*. Thames & Hudson.

³⁵Leupen, B. (2006). *Frame and Generic Space*. 010 Uitgeverij.

this. Whether this causes any real change in the way we envision, design and build remains a question: the parties addressed are primarily the same ones that are, in part, responsible for the current situation.

Again, the obvious option is a system of Open Building, e.g., as defined decades ago by John Habraken *cum suis* and, later, adequately described³⁶ by Stephen Kendall. Returning to the small gray book from the introduction, i.e., Habraken's "the support and the people" (1962), it is this most actual argument that again retains its value: "*A meaningful industrialization of housing only has a chance of success if the individual resident is given a full place in realizing his or her own home. No half participation and no reduction in industrial production, but a new relationship between producer and individual user in a new society: the end of mass housing*"³⁷ (transl.mp). It is this "meaningful industrialization" – provided, in part, with increasing technological possibilities – that offers all participants in the housing chain options for a role of design, maintenance, and reuse³⁸. Since I will describe this further in Chapter 11, I will suffice here with its framework as described by Frans van der Werf: "*When it concerns the levels of change within the built environment the core question can be 'limited' to who decides, in what frame and about what?*"³⁹ (transl.mp).

Even the Dutch National Housing Agenda (Nationale Woonagenda, 2018-2021) states that "People want to give more and more substance to the way they live"; since our house serves as a framework for our home, the next chapter will discuss this ever-complicated issue.

³⁶Kendall, S. (2015). NOTES on the History and FUTURE OF OPEN BUILDING and the OB Network. <http://Open-Building.Org/>, 104, 1–7. Retrieved from http://open-building.org/archives/Notes_on_the_History_and_Future_of_Open_Building_and_the_OB_Network.pdf

³⁷Habraken, N. J. (1972). *de dragers en de mensen*. Scheltema & Holkema. (zie ook: <https://openinbouw.nl/open-ontwerpen-en-gebouwen/>)

³⁸Some years ago, Jan Rotmans stated in an interview in Bouwformatie (January 2015) that "as a builder you have to employ people that know people" (..) "what building company employs social-psychologists?" (transl.mp).

³⁹Werf, F. v. d. (1993). *Open ontwerpen*. 010 Publishers.

*“we see the buildings like stars, they are superimposed with stars,
we only see the light. It is not like cement or, I don't know, bricks.
The buildings are in light form, there are no settled door in it.
so we enter where we want. We go out when we want and how we
want.
But that does not show.”*

Neil Beloufa,
From the film/doc. 'Kempinski', 2007

7

Home

“when the peaks of our sky come together, my house will have a roof.”

Paul Eluard

“We must learn again how to inhabit.”

Jaques Derrida

The Hague, [Gemeentemuseum](#); the large painting shows a wide, bare space with open structures, outlined by thin frames and partially filled with transparent, white, and soft-colored panels. In other similar works, ladders – long, narrow, and seeming rather unstable – suggest to provide an escape to, where exactly? There is no visible horizon; the perspective seems endless, without any visual boundaries to the sides and above. In it, human-like red blotches seem to float through space, desperately seeking shelter close to the panels but lost in an artificial environment that looks alien, inhospitable, and barely livable. This seemingly dystopian world is part of the work of Constant Nieuwenhuys, the artist and visionary who worked on his “New Babylon” project between about 1960 and 1969. The painting (“Entrée du Labyrinth”) however is dated 1972, some years after Constant had decided to terminate working on his all-encompassing vision. The project, largely based on historian/cultural theorist Johan Huizinga’s “[Homo Ludens](#)” (1938), tried to envision a world in which people would not have to work anymore due to increased automation and robotization. In a world largely articulated by common spaces in favor of private spaces, one could spend the time on play and creativity; nevertheless, an environment as envisioned is not a playground only. Nomadic

man was not to be attached to one place only but able to occupy a space/make a place as long as needed; as illustrated by [Hilde Heynen](#): “*The individual can thus form his own home, within a global structure that exploits all poetic possibilities of technology*”¹. But years later, it appeared to become the exact opposite of what it is believed or supposed to be: a place for total “freedom.” New Babylon was structured on the assumed promise of social and technological future developments, both, however, not yet in sight. The unforeseen result was a world of control, an alien world of estrangement in which the familiar traditional connotations of what was considered a home were turned upside-down.

Constant could no longer envision or incorporate humans in his project; man was reduced to random, lost figures in red; no longer the free, self-conscious inhabitant but the individual searching for a place to dwell. Fifty years later, in 2018, [Bruno Latour](#) would conclude that today “*we live in the ruins of modernization, we look in the blind for a place to dwell*”².

A place to dwell

To have a home in the world means to have a home in real time; to have a home in a networked world is basically not that much different when focused on the principle of “dwelling,” i.e., to be “at ease, at peace” in a certain place, at a certain time. The latter, however, requires the awareness that technologies that influence and modify our environment – our dwelling space – should also be regarded as possible options to ensure a form/method of spatial privacy as well as facilitating enhanced experience, not as threatening and/or comforting only. “Home-automation” in that sense is something of a paradox: many technologies automate human action and/or activity, but at the end, nothing has fundamentally changed. It is technology as a convenience, as comforting service without any additional human value. Automating former manual actions within, e.g., our cars reduces the car to a vehicle/mode of transport; automating functionalities within the home reduces the home to a roof over our head, to a place of comfort only. All that is essential for dwelling can never be automated; it is and will forever remain a work in progress. As [Mark Wigley](#) so adequately argues: “*(..) because the house conceals the unhomeliness that constitutes it that the “mere”*

¹Heynen, H. (2001). *Architectuur en kritiek van de moderniteit*. SUN. (p.231, transl.mp)

²Latour, B. (2018). *Down to Earth*. Polity.

*occupation of a house, which is to say the acceptance of its representation of interior, can never be authentic dwelling. (..) Home is precisely the place where the essence of home is most concealed*³.

With New Babylon in mind: what exactly caused Constant to end the works on his all-encompassing and extensive project, were/are his proposals indeed the wrong answers to the situation but, in its ultimate goal, the adequate approach and justified methodology? When Michel Serres stated *“We seek to find, in our dwelling, in our room, in our bed, the sensations that we experienced for nine months”*⁴, somehow, he acknowledged that from the moment we are born, we can never be at home. These texts therefore try to cover the question of ontology: do we need the physical, separated, enclosed entity we call home to ensure we can dwell? If so, what does that look like? If not, what is the alternative, what does it (not) represent?

Like architecture in general, also before and while designing and building housing, a determining question is how the ultimately envisioned/created space will be used and experienced since after all, we do not provide elementary shelter only. So far, we do not limit ourselves to a basic construction, we provide an artificial physical framework (including designed decisions and statements) providing the prerequisites for lived space; as such, it will function also as a barrier between man and nature as well as between man and technology. Nevertheless, recalling the words of Bloomer and Moore: *“the general assumption, seldom debated, is that architecture is a highly specialized system with a set of prescribed technical goals rather than a sensual social art responsive to real human desires and feelings”*⁵. However, we seem to encounter a contradiction here; i.e., “a set of technical goals cannot be paired to sensual social art.” I believe that architecture, when executed properly, can and should facilitate the arts and, as such, also answer the human desires and feelings that are essential for experiencing our lived space.

At the same time, architecture and “technology” can facilitate human desires and feelings by acknowledging that it is the conscious inhabitant that comes first: technology should serve instead of control. If we become the unconscious victims of increasing technology, we become victims within our environment, without really understanding what went wrong. In their extensive report, Michael Friedewald *et al.* state *“in order to gain wide acceptance a delicate balance is needed: the technology should enhance the quality of life but not be seeking domination. It should be reliable and controllable but nevertheless adaptive to human habits and*

³Wigley, M. (1995). *The Architecture of Deconstruction, Derrida's Haunt*. MIT Press. (p.113-114)

⁴<https://mydesiringmachines.wordpress.com/2014/10/19/michel-serres-on-architecture-urbanism-space/>

⁵Bloomer, K; Moore, C. (1977). *Body, Memory, and Architecture*. New Haven and Yale. (pref.)

changing contexts”⁶. (A variety of online videos illustrate this issue in a hilarious way: e.g., a man returns to his “smart” home with a voice-controlled front door, an hour before, however, he visited his dentist where he received an anesthetic. Once he orders the front door to open, he is not understood since his blurred voice is no longer recognized: the door remains shut⁷.) Like a wide variety of “solutions,” we could question which problem was originally in need of addressing; while in certain circumstances, the need for a door-opener (voice-controlled or otherwise) will not be subject for discussion where it serves inhabitants with a severe handicap or confined to a wheelchair, it is by no means a necessary item in each and every house. It serves no other purpose besides comfort, and the goal and the intended/assumed result of the technology remains the same, i.e., the door opens or maybe not. Assuming we do not wish to strive for Ray Bradbury’s fully automated home⁸ (which, abandoned in the end, burns down to the ground), it is us who need to remain in control, not our home. A recent report/study⁹ by ING on smart homes, suggesting that “the breakthrough of smart homes is near” illustrates the paradox: e.g., “*Voice is only an intermediate step to Artificial Intelligence where the smart home itself knows what needs to be done*” (transl.mp). It is not “the smart home itself that knows what needs to be done”; it is an algorithm, programmed by humans to identify, address, and react to a particular situation. It is about the way we relate to our home environment that is changed here; we no longer have a mutual relation to our home but experience an environment that reacts/adapts according to external influences. At the same time, the report addresses the issue of reduced labor; since more people can install their devices themselves, the role of the professional is reduced, causing less work and unemployment. This is a confusing purpose and means while addressing commercial purpose first instead of keeping the inhabitant in control.

A parallel current complaint is that housing has become too expensive: the costs of building regulations and all “modern” (technological) items involved has made contemporary building not only complicated to design and build but also expensive. The framework we call a house has “developed” into a commercialized product derived far of what is, in fact, desired or necessary. If we accept that the fact – if you prefer, the choice – to consider our housing a neoliberal market-product to be bought and sold like any other product – as we do now for decades – we should stop being annoyed about the consequences. We have so far

⁶Friedewald, M., Costa, O., Punie, Y., Alahuhta, P., & Heinonen, S. (2005). Perspectives of ambient intelligence in the home environment. *Telematics and Informatics*, 22(3), 221–238. <http://doi.org/10.1016/j.tele.2004.11.001>

⁷<https://youtu.be/-gZs73DeUQg>

⁸https://en.wikipedia.org/wiki/There_Will_Come_Soft_Rains_%28short_story%29

⁹https://www.ing.nl/media/ING_EBZ_doorbraak-smart-homes-dichterbij_tcm162-181983.pdf

dismissed our options for empowerment, our possibilities for participation, and our fundamental right to create a private place we call – and define as – home. If we buy, let alone rent a house, we have already drifted away from the options to create our own (built) environment; we are confronted with the often poor residues of the design and building processes, i.e., the minor cosmetic adaptations that cost the inhabitant usually much more than really necessary. Curiously, for the place we call home, in which we spend most of our time, we have to trust/rely on third parties to achieve what is so vital to our life, i.e., our home. As a result, we end up with what Kisho Kurosawa and later [Lieven de Cauter](#) referred to as a capsular society, i.e., creating an enclosed private sphere.

One could question whether this is a matter of supposed convenience or simply disinterest; did we ever agree/consent with the current marketing of our housing or do we believe this is the default? It seems what is sometimes referred to as shifted baseline syndrome (SBS), i.e., the fact that we tend to see the current situation as the “normal” one, instead of recognizing that the situation really can/should be a different one. If we, e.g., accept the fact that our home is no longer the private space it is supposed to be, we have shifted our standards and believe the current situation is the new default. When it comes to issues of privacy within our homes, the same estranged situation occurs. Our home is no longer the secluded, (legally) protected private space it once was. The valid argument here is often that we have “nothing to hide” where the argument is/should be that we do have much to protect as well as to participate in. If “to dwell” means to be at peace in a certain place – and at a certain time – it implies within a hybrid world the opposite of a fixed place since we no longer experience or consider this the safe haven we knew. Rephrased: it means that where it concerns our private space, we should acknowledge that some physical entity should provide the basics for our shelter and that some digital entity should protect our privacy, which today within the context of an Internet of Things and People implies the synthesis of both. In the illustrative words of [Shusaku Arakawa](#) and [Madeleine Gins](#): *“One’s own living room is and isn’t one’s own sensorium. All that is tentative is in the realm of sensoria; all that appears to be definite has been physically constructed”*¹⁰. Imagine the possibilities of using developing innovative (digital/sensorial) technologies available for incorporating the arts: the five senses and the imagination, within what is “physically constructed.” The “living room,” i.e., lived space, is the sphere we create by applying and incorporating (sensorial) technologies that facilitate and enhance our experience.

¹⁰Gins, M., & Arakawa, S. (2002). *Architectural Body (Modern & Contemporary Poetics)*. University Alabama Press.

While on one side, we are more connected and mobile than ever, we also seem to seek the safe house we know; to dwell is a work in progress. Witnessing the current trend for tiny housing – one of its often intended advantages being closer to nature – is that we apparently recognize that the ways we inhabit can/should be concentrated on what is sufficient, responsible, and manageable but also, at the same time, seems a return to the romantic, capsular entity that withdraws from urban “modern” life. An increasing number of people seem to seek other contemporary values and priorities while translating those to their immediate environment; at the same time, technological developments amount to its – assumed – opposite. It was [Sigfried Giedion](#) who remarked decades ago that architecture is the interpretation of a way of life valid for our period. Although this statement does raise some questions concerning what validity is referred to, its overall value as our “place on earth” seems hardly negotiable. Today, however, there seems to occur a rather fundamental difference between what is envisioned on one side by those who seek the basic values of a traditional built home environment covering all aspects of a comfortable home life; while at the other side, the increasing synthesis of the digital and the analog and of the real and the virtual questions this.

When William Mitchell, 20 years ago challenging our imagination, predicted that “(..) *“inhabitation” will take on a new meaning - one that has less to do with parking your bones in architecturally defined spaces and more with connecting your nervous system to nearby electronic organs. Your room and your home will become part of you, and you will become part of them. (..) For cyborgs, then, the border between interiority and exteriority is destabilized*”¹¹, he, thus, challenged the pure ontology of home as we know it. But “parking ones bones” suggests somewhat practically that what is at stake here is a more or less temporary need to seek shelter, not some permanent home. It emphasizes the ever-existing need to dwell, not the necessity to find a physical place and stay. This nomadic point-of-leave confronts us with another way of building, one that facilitates primary shelter but also provides the “nearby electronic organs,” whether we will be(come) cyborgs or not.

Home in a hybrid world seems to develop into an increasingly problematic item; the paradox of having a shelter without having protection other than physical, a place that is not “chosen” by us but, to a large extent, for us by a system that renounces us from being a participative inhabitant does not do justice to our (occasional/temporal) need for a private sphere. First, there is the condition to dwell, second, the translation

¹¹Mitchell, W. J. (1996). *City of Bits: Space, Place, and the Infobahn (On Architecture)*. The MIT Press.(p.30-31)

into a sphere that facilitates, and, third, the physical framework in which this occurs. In an environment that increasingly develops into or becomes an interface, it is primarily, as put by [John Rajchman](#), “a question of constructing free spaces of unregulation, undetermined by any prior plan, which so loosen an arrangement as to follow for sensations of something new, other affects, other precepts”¹².

“Free spaces,” however, require a rethinking of its consequences for (spatial) privacy; the next chapter will try to provide a start for this.

¹²Rajchman, J. (1998). *Constructions*. MIT.

The Sustainable Development Goals (SDGs) are sinking in as actionable focal points of interest. It leads to rethinking the #IoT space of wearable, home, car, and city in a different way. In the home space, we can think of dwelling, work, what is decision making structure? SDGs that fit are 7: Affordable and Clean Energy; 8: Decent Work and Economic Growth; 11: Sustainable Cities and Communities; 12: Responsible Consumption and Production; and 17: Partnerships to achieve the Goal. In "IoT Is Reducing Bank Branch Foot Traffic," David Nelyubin describes that 2.5 to 3 billion people will use financial services space between 2010 and 2030 and 95% of those will never visit a bank branch. Money will not seem to belong to a bank but seems only to exist in your phone. This untying on services with location will be a strong characteristic of future everyday living. This was foreshadowed by a technical reasoning such as the Internet-Draft: Motivation for the Session Initiation Protocol (SIP) as an application protocol for 6LoWPAN devices: *"if a guest is charging their electric car at a friend's house, we should consider applications that will understand that the charge should appear on the guest's electric bill and not that of the friend"* (<https://link.springer.com/book/10.1007/978-3-642-40403-0>). This simple and human mix of at home everywhere (with the settings of your devices) without any single static location as "home" will feel very normal.

Rob van Kranenburg
Founder of IoT-Council

8

Privacy or privacies

“Soon, your house could betray you.”

Rem Koolhaas, Art Forum

“Architecture is more than an array of techniques designed to shelter us from the storm. It is an instrument of measure, a sum total of knowledge that, contending with the natural environment, become capable of organizing society's time and space.”

Paul Virilio, Lost Dimension

Within the context of this publication, the complicated and multi-faceted issue of privacy is – also given the fact that my experience is in (interior) architecture and its wide periphery, but most certainly not law – an area of somewhat treacherous content. It implies that I do not consider myself qualified to discuss in depth all relevant issues of privacy, in particular, where it concerns its legal aspects. Therefore, allow me to be supported here primarily by professionals in this discipline; for now and in this case, by proceeding on a definition or, in fact, rather a description provided by [Daniel Solove](#):

“Privacy is a complicated set of norms, expectations, and desires that goes far beyond the simplistic notion that if you're in public, you have no privacy. (...) We often don't want absolute secrecy. Instead, we want to control how our information is used, to whom it is revealed, and how it is spread”¹.

¹Solove, D. (2008). *Understanding Privacy*. Harvard University Press.

The one thing that becomes clear here once more is that privacy is a “container-term” to be articulated when it concerns, e.g., spatial or other notions of privacy. For these texts, my emphasis is the former, given the situation that as long as we consider or think of our traditional built home as the primary frame for spatial privacy — and do not (re)think other ontologies — it is this classic traditional connotation that prevails. At the same time, we need to be aware of the possibility that other typologies of spatial privacy can be organized within another typology of housing; i.e., one that supplies common spaces in combination with (chosen) private spaces, as can and will be a logical consequence of a support/infill structure. It implies that certain digital infrastructures can be shared and commonly protected while others function “behind” those barriers and can be protected individually. This consideration is, to a large extent, based on the most likely situation that for decades to come, we will — given the traditional building chain — have to deal with its products or results; i.e., on a larger scale, together, we will need to find ways to address the changing framework/basics of our housing space and, as a result, its basics of spatial privacy. If we can rethink our private space in favor of a separate concept within a large-scale framework, it is no longer the traditional, physical separation between public space and private space that defines our spatial privacy. We need to be aware of the obvious factor though that this shift requires the rethinking of both private space as well as privacy within such a space, i.e., our spatial privacy within our “home” is no longer linked to the current physical translation of that home.

At the same time, it is obvious that this seems to act as a barrier when we rethink more in depth and try to envision other, less physical frameworks. [Luciano Floridi](#) argues that we should distinguish four kinds of privacy, i.e., *physical* privacy, *mental* privacy, *decisional* privacy, and *informational* privacy (ital.orig.)². I will, given the context of these texts, synchronize his physical privacy with spatial privacy, also since Floridi refers in this to the “*freedom of sensory interference or intrusion*” that “*invades personal space.*”

In the Netherlands, it is Article 12.1 of the Dutch Constitution (“de Grondwet”) stating that “Entry into a home against the will of the occupant shall be permitted only in the cases laid down by or pursuant to Act of Parliament, by those designated for the purpose by or pursuant to Act of Parliament.” “Entry” here — originating in Dutch 19th-century law — is considered physical entry by person(s), but already back in

²Floridi, L. (2014). *the 4th Revolution*. Oxford University Press. (p.102)

2005, Koops and Prinsen³ have argued that digital “entry” should be incorporated as equal/additional to physical entry, arguing that future developments in digitalization should not be excluded from protective law concerning, e.g., our increasingly connected increasingly connected homes. Now, some 15 years later, we can safely conclude that their concern and plea remains justified; at the same time, we come to the conclusion that up till now, the legal protection still seems inadequate. In the words of [Bart Verschaffel](#): “*In the seclusion of the house one can think and say whatever man wants without someone can hear or has the right to listen, and one can stay there when one does not want to go anywhere. This means in a democratic society, where everyone has the right to therefore ‘privacy’ that these private spaces are saved from the world in which everyone can be free to go wherever he wants*”⁴ (transl.mp).

This emphasizes not only the value of (spatial) privacy but also character, definition, and appearance of “private spaces.” By building an environment that serves as a framework for housing, we save the precondition, i.e., “spaces” from the world that are not necessarily “private spaces.” It is only when these spaces are determined to function as “private spaces” – i.e., houses – that certain legal protection, together with what is controlled by the inhabitant, is required for primarily “spatial privacy.” In this sense, what should not be forgotten is that when these “private spaces are saved from the world,” their function is housing tenure that – as stated before – in our country is to a large extent envisioned or destined to be owned, not primarily rented out. In particular, when larger structures facilitate flexible housing for the longer term, this comes with the responsibility to incorporate elementary aspects of privacy, to be further articulated and controlled by the inhabitant.

We all experience – or at least should be aware of – the current digital intrusions of our private space, be it caused by single machinery or gadgetry, by infrastructures, media and materials, or last, but not least, the Internet connection *as such*. To address only a few items here: we know the smart meter, the thinking fridge, the listening television, the spatially descriptive vacuum cleaner, the communicating console and talking smartphone or the cuddling teddy bear, the registering running shoes or the cursing robot, etc. To a certain extent, we find this useful, amusing, or even innocent; we do not, however, always recognize the structural pattern of complete monitoring and control when it comes to whatever we say or do in our private spaces. In the words of [Shosanna Zuboff](#): “*That our walls are dense and deep is of no importance*

³Koops, B. J., & Prinsen, M. M. (2005). Glazen woning, transparant lichaam . een toekomstblik op. *Artificial Intelligence*, (2), 624–630.

⁴Verschaffel, B. (2010). *Van Hermes en Hestia*. A&S /books - Ghent University.(p.124)

*now because the boundaries that define the very experience of home are to be erased. There can be no corners in which to curl up and taste the pleasures of solitary inwardness. There can be no secret hiding places because there can be no secrets.”*⁵

There is however a difference; most domestic items referred to above can be considered as situated in or additional to our primary notion of (spatial) privacy; after all, they all are situated in the spatial framework in which they function, and they are connected to our traditional connotation of home. If, in Zuboff’s words, there “can be no corners to curl up” or “secret hiding places,” this is primarily because of their spatial reference and not because of its technological “connection.” If “the boundaries” of home are to be erased, it is within our current experience of home, and if it is the experience of home, we may be in need of a different understanding of home, i.e., another definition. I consider the active, participating inhabitant as instrumental within his/her sphere, i.e., we will always need “corners and places to hide,” no matter their (physical) translation or appearance. We should, however, be in a position to make a well-considered and conscious choice, to be facilitated by technology as a whole, not as a refuge or hideout. I hope to have clarified in the previous chapters that I believe that the inhabitant should have control over his/her immediate environment, be it the built entity or the (sensorial) sphere it provides.

The often noticed remark about connected objects that it is up to the citizen/user to protect his (built) environment and the objects within can be qualified as too simple and single-sided. In a recent tweet on primarily smart cities, tech-critic [Evgeni Morozov](#) defined/articulated “smart” verbally creative as “*surveillance marketed as revolutionary technology.*” Back to Weiser’s initial prophecy: ambient technology is pervasive, and, selectively, we should address and influence its role and function.

Architecture has the task to frame and design the prerequisites for saving (private) places “from the world,” in such a manner that its result does not facilitate secluded spaces only. To determine privacy in this context is to determine privacy in its context of space and time, i.e., to proceed from “privacy to privacies.” What should be protected is the sphere we – so far – define as “home,” no matter its appearance and/or physical translation, no matter its temporary or final status. The suggestion, also made by Koops and Prinsen, to (re)phrase that “*the house is inviolable*” surpasses the fact that not all physical places in which we claim spatial privacy are – or forever will/should be – houses. At the same time, if we search for (legal) solutions that safeguard our privacy within the current system of building housing, we do not act within future

⁵Zuboff, S. (2019). *The Age of Surveillance Capitalism*. Profile Books. (p.478)

parameters, i.e., we acknowledge process and product as well as their position within the (traditional) built environment. A house is not a home; rethinking spatial privacy should be accompanied with a rethinking of what constitutes home, i.e., private space. Should we research more progressive means of protecting (spatial) privacy, we may come to the conclusion that this excludes solutions within the current practice of architecture, i.e., building and supplying housing, in favor of more innovative, digital – personalized – ways to define, control, and protect our “privacies” (see, e.g., Spuybroek’s Son-O-House).

As far as I know, we still lack adequate research that illustrates how humans behave and (re)act in a hybrid built environment; the fact that we (can) withdraw in our private space blinds us for the fact that this space is no longer private in the traditional sense that we are familiar with. Already more than 20 years ago, back in 1997, Dorien Pessers wrote in *Archis*: “*The image of man in the communication society contrasts sharply with the humanistic image based as it is on the metaphor of the stratified inner self. (...) Legal protection of the dwelling is meant to include protection of this humanistic image. But it is precisely this personality – one the outside world cannot control – which stands in the way of efficient functioning in a communication society.*”⁶

Consequence is that our personality is not the only entity that has to be protected; it is the personality and/or identity within its context, in this our dwelling. In a hybrid world, identity is influenced by the shifting relation between man and environment, including present objects (see also the “Onlife Initiative,” Chapter 10). Does that imply that we need to maintain the current ontology of our homes; or can we rethink our home in such a way that its function becomes – and develops - dependent of the inhabitant? Rephrased and simplified: we now supply a built environment – i.e., housing – that provides maximum presence and experience *in itself*; to what extent can we realize a minimal (built/artificial) environment that functions as a neutral framework, with the maximized options for personal experience? After all, first, we envision or think (an eco-system and) a built environment, only after that we build. Again, Pessers: “*What will happen with man and his inner state when the symbolism of the dwelling change with the dwelling’s changed function?*”⁷ If we desire or make a choice for a distance between our traditional concept of place and the close link to identity, we gain the fruits and freedom of (re)thinking that place, possibly in favor of a less nostalgic one.

⁶Pessers, D. (1997). House of the future, symbolism of the past. *Archis*, 8, 68–73.

⁷Ibid.

Searching for freedom today implies that we do so starting from the still traditional dichotomy of private space vs. public space. Since we have framed our private space – i.e., our house – as a physical entity, this has the consequence that *“Housing (“Wohnen,” says Sloterdijk) is, from an immunological point of view, a defensive measure that protects an area of well-being from intruders and other discomforters”*⁸. This could be understood as reference to intruders as a person and to other “discomforters” as a variety of other (digital) trespassers. When the house fails to offer that protection (and additionally the law fails to adequately and/or sufficiently address and answer this problem), the ultimate solution is to discard the current ways of building/providing housing as inadequate. This leaves us two options: either we rethink the principles of building housing or we rethink the principles of principles of providing privacy. Since I believe that some primarily physical entity will be needed for some decades to come, the ultimate solution will be a synthesis of both, still emphasizing the primary function of providing the basics for (spatial) privacy. When, years ago, the “Ambient Intelligence” vision was proposed by Aarts and Marzano, a suggested solution to data protection was an “access-key,” to be utilized from, e.g., a smartphone or any other item close to our body⁹.

The, by now, somewhat obsolete terms “ambient intelligence,” “pervasive computing,” or “ubiquitous computing” illustrated that technology is/will be all around us (see, e.g., Weiser’s text), causing the parallel mistrust many have when it comes to technology in general and within our private space in particular since “ambient intelligence” will act in the shades; invisible but present. As Bibi van den Berg concluded earlier: *“The central argument for embedding technologies that is presented is the idea that people do not want their homes or offices to be cluttered with technological devices, but at the same time they do want an increasing amount of such systems to relieve them from their (repetitive, cumbersome or boring) tasks and duties”* (ibid., p.65). She refers to the often-noted “improvement of the quality of our lives.” It raises two questions, more or less parallel to my previous remarks where it concerned our housing: first, I am in doubt whether people really believe or maintain that ambient technology is needed to relieve them from arduous or boring tasks. Second, and far more important, who will objectively describe or even define our “quality of life”? Like any project developer who argues when it concerns housing that “this is what people want,” we have no real obvious reason other than commercial ones to argue that we know what people want or that we know anything significant about any personal/individual quality of life. Technology companies can and will continue to dream about or envision future innovative technologies that are supposed to make our

⁸Sloterdijk, P. (2009). *Sferen II / Schuim*. Boom Onderwijs.

⁹See e.g. Berg, B. va. den. (2009). *the Situated Self; identity in a world of Ambient Intelligence*. (p.63 >)

lives easier and more comfortable, but I paraphrase again the remark posed in the introduction: to what question is this an answer? The simple fact that, e.g., [Council](#) understood and argued that the Internet of Things should be redefined as Internet of People, together with the actual discussions about the future of the Internet, illustrates the increasing concerns these days. It is human who is in need for a certain amount/form of (spatial) privacy; appropriate technologies should serve as a personalized instrument to achieve, frame, and protect this.

Where Council argues for talking “privacies” instead of “privacy,” it was Bibi van den Berg who argued for “situations” instead of “places” to emphasize “*the where of our human condition, on the places of our experiences*”¹⁰. Rephrased: identity and (spatial) privacy determined and safeguarded according to a variable occasion and situation.

DECODE is an experimental project to develop practical alternatives to how we use the internet today - four European pilots will show the wider social value that comes with individuals being given the power to take control of their personal data and given the means to share their data differently.

DECODE will explore how to build a data-centric digital economy where data that is generated and gathered by citizens, the Internet of Things (IoT), and sensor networks is available for broader communal use, with appropriate privacy protections.

<https://www.decodeproject.eu/what-decode>

Transparency

If we look more closely at some early projects as mentioned in Chapter 4, we witness parallels with today’s topics: e.g., in [Karel Teige](#)’s “Minimum Dwelling” (1914), an important issue was its aimed transparency, and, with that, the continuing discourse concerning private space vs. public space. [Christophe van Gerrewey](#)

¹⁰ibid., referring to E.Casey. (p.141)

recently described it somewhat provocatively in an extensive article: *“Living; no longer a private and individual occupation in an unhealthy, dusty and even morbid civilian interior, but a modern, liberated, shared activity for people and who not only have possessions anymore, but also quite a lot properties and qualities part. Transparency in architecture thus also means the removing of the distinction between public and private, or even between individuals”*¹¹ (transl.mp). If we remember the Onlife Initiative (OI) and its the works of Hannah Arendt, we notice the emphasis of that same difference between both public and private space. Situated in its time, Teige’s ideas – and later, e.g., – were based on the removal of this dichotomy that is by now again by many considered undesirable, in particular, given the increasing use of monitoring technologies together with the wishful statement that transparency improves the life of us all. Full transparency implies full control and the loss of privacy; “transparency in architecture” implies architecture” implies “the removing of the distinction between public and private” only as long as we assume that it concerns architecture in the traditional sense, i.e., as a built environment only. Because as long as it is architecture – as the adaptation of space to human needs – that frames and articulates this dichotomy instead of adaptive innovative frameworks that facilitate housing, it is in need of protection of primarily physical space. This was already illustrated years ago by Rob van *“The question is: what will we choose to build? A City of Control or a City of Trust?”* (referring here to David Brin’s “the Transparent Society¹²,” the former being a “city of our the latter a “transparent” city) *The trouble is that so few of us are talking about these very new kinds of cities. There is no grand master-plan to look up. No city planners to consult nor architects to harangue”*¹³.

What transparency implies we may experience almost every day: it should mean that when “to dwell” is considered to be at peace at a certain time/place, it is also a plea to “know thyself” and be transparent – by choice – at a certain time/place. What Teige’s and/or similar projects distinguish from today’s is the fact that now digital technologies offer us the possibility to actively decide and participate; i.e., “decide” about our own identity and its – spatial – “transparency.” Large infrastructures offer us the possibility as well as the much needed (technological) flexibility to facilitate dwelling instead of building houses; i.e., until now, our “settings” of privacy are (supposed to be) determined by law. However, as argued by Daniel Solove *“Privacy is not simply a way of safeguarding individuals from social control, but is itself a form of social control that*

¹¹Gerrewey, C. van. (2019). *Transparante Architectuur in de twintigste eeuw, van Le Corbusier tot Rem Koolhaas. De Witte Raaf, 199, 7–9.*

¹²Brin, D. (1999). *The Transparent Society: Will Technology Force Us To Choose Between Privacy And Freedom?* Basic Books.

¹³Kranenburg, R. van; S. D. (2009). *The Internet of Things.* Institute of Network Institute of Network Cultures.

*stems from the values and norms within a society*¹⁴ (transl.mp). A choice for a more individually designed housing within common frameworks instead of the system of supply could bring another set of “values and norms,” a set based on more common principles instead of individual values.

An attempt to discuss the necessary atmosphere for this is the content of the next chapter: “Thinking and rethinking.”

¹⁴Solove, D. (2010). De betekenis en waarde van privacy. In *Open, Voorbij privacy*. (pp. 34–44). NAi Publishers.

“Do houses move around you; or do we move around houses?
What does making a house mean?”¹

Both questions were raised during an exhibition in Tate Gallery of a work by Mario Merz; a small half-dome, consisting of a steel frame loosely covered with stone slabs, with no physical entry. It is the archetypical shape of what we would call a shelter, were it not for the absence of any human possibility to enter.

¹<https://www.tate.org.uk/art/artworks/merz-igloo-do-we-go-around-houses-or-do-houses-go-around-us-t05755>

9

Thinking and rethinking

“Problems of dwelling are above all not architectural but ethical problems”¹.

Karsten Harries

“Architecture is more than an array of techniques designed to shelter us from the storm. It is an instrument of measure, a sum total of knowledge that, contending with the natural environment, become capable of organizing society’s time and space.”

Paul Virilio, Lost Dimension

In the introduction, I have emphasized that these texts are not intended as or written in a scientific mode, nor that I claim to be comprehensive when it comes to the periphery of this topic. These texts are focused on three, in my view, complementary issues: architecture, technology, and dwelling, which could well imply that it seems wishful to add an order in this and also to remind us that the circumstances today have some resemblance to earlier times. As illustrated in, e.g., Chapter 5, all three seem only to be publicly/commonly discussed separated from each other; where it concerns a topic important for each and every citizen – the home – the emphasis is not on what binds all three issues, while, at the same time, we all are “confronted” with the ultimate result, i.e., the house as a framework for our homes.

¹Harries, K. (1997). The Ethical Function of Architecture. MIT Press.

As illustrated in Chapter 4 (“Early and recent history”), about 30 years ago, several architects made serious attempts – sometimes with foresight and interesting results – to restore and/or intensify the link between architecture and philosophy; in particular, founded on the existing discrepancy between both. Since dwelling is a timeless issue and history seems to repeat itself here, allow me to elaborate a bit further.

Think again of the statement by Leo van Broeck in the “Introduction”: *“We should (re)organize the spatial presence of the human species on earth.”* However, momentous as this may sound: this is a recurring issue within architecture and given the fact that this discipline is considered the appropriate one to realize this, it is the question whether “architecture” is capable of shaping and articulating such a presence or such an environment. After all, every built result is a “final” result, i.e., a physical translation of a series of complex questions that often *can* have no adequate answer. If we take seriously the fact that our life needs – and is now again confronted with – a series of uncertainties, ambivalence, or even sometimes chaos, how do we expect architecture to answer this other than to provide a framework for actions only? As once so adequately illustrated by Eric Bolle, referring to Peter Eisenman, who *“designs an architecture that does not close, does not totalize or unify, but on the contrary opens, scatters, fragmentates, and thus meets our state of fundamental uncertainty. (..) what is unlocked is an architecture of absence: a space to roam freely, to roam around uninhibited”*² (transl.mp). It implies that the notion of a particular place for a particular person is abandoned; each individual is in fact a nomad, to be treated equally when it comes to a place to dwell. Instead of claiming/using a fixed space/place, we utilize the options provided within the framework provided by common structures, articulated by means of open and participatory technology.

One could argue – these days in particular with good reason – that dwelling is the most elementary fundamental topic. First, we encounter its various origins and definitions, often according to the discipline involved; e.g., the UK law defines “dwelling” rather rational as “a self-contained substantial unit of accommodation”³. If we search deeper, we find other descriptions or definitions that have in common that many define/refer to the issue as some physical entity, an artificial form facilitating shelter or a house. It should be obvious by now that, given the scope of this publication, I consider the rather practical or pragmatic definition provided above not the primary one that is the subject for discussion.

²Bolle, E. (1992). *Tussen Architectuur en filosofie*. VUB Press.

³<https://en.wikipedia.org/wiki/Dwelling>

One most relevant to these texts is [Christian Norberg-Schulz](#)'s condensed phrasing: dwelling is an "existential foothold"⁴. Other, more abstract, definitions utilize a more theoretical or philosophical approach, e.g.:

"Dwelling is the cultivation of feelings in an enclosed space, that is, a way of interacting with these environments that overflow into physical space and affect us in a bodily way, in order to avoid being affected in a mere passive sense, by making these environments intimate, familiar, to a certain extent adaptable" (Hermann Schmitz, orig. "Der Mensch und die Grenze im Raum," cited⁵ by Holger Zaborowski). The interesting part of this definition to me concerns the "enclosed space" and its "overflow into physical space," i.e., the suggestion made here is that the former exists next to the latter, emphasizing a necessary active involvement or participation in this.

Since I am interested in the ontology and functionality of these "environments" within an increasingly networked hybrid world in combination with the framework of these texts, I will begin by leaning on [Martin Heidegger](#)'s well-known lecture⁶ dating back in 1951. Briefly, Heidegger considered "dwelling" a phenomenon that goes beyond the realm of buildings, an activity first although it is – in part – depending on that same building. Illustrative, in particular, compared to present times is his statement concerning the role/position of dwelling, made after World War 2 and, therefore, more than understandable: *"However hard and bitter, however hampering and threatening the lack of houses remains, the real plight of dwelling does not lie merely in a lack of houses"*⁷. Heidegger here emphasizes the need to think beyond the realm of not only providing a physical structure but also to consciously consider the impact a house will have when reduced to just a protective framework. Dwelling is always a dwelling in time; when, e.g., [le Corbusier](#), in 1942, stated that *"man dwells badly, and that is the deep and real reason for the upheavals in our time,"* he did not refer to future situations; he could not foresee our contemporary "upheavals." Nevertheless, in both statements, it seems clear that indeed "we can only build if we can dwell," i.e., if we feel safe and secure but also in close encounter to the natural and artificial worlds that surround us, serving as a concept for our sensorial, lived space. This is a concept "renewed," i.e., our "hybrid/networked" environment today is and

⁴Norberg-Schulz, C. (n.d.). *Genius Loci: Towards a Phenomenology of Architecture*. (1980th ed.). London: Academy Editions.

⁵Zaborowski, H. (n.d.). Towards a Phenomenology of Dwelling. *Catholic Review*, 32(Fall 2005).

⁶Heidegger, M. (2007). *Bauen Wohnen Denken. Vorträge Und Aufsätze*, 139–156. (I have used the English translation by Adam Bobeck)

⁷Heidegger, M. (1951). *Building, Dwelling, Thinking* (p. 15).

will become more “sensorial/tactical” than ever before, offering us not only disruptive and/or threatening aspects but above all the additional enhancing, experiential variations. As Hartmut Rosa so imaginatively illustrates when discussing controllability: “(..) *home* only becomes a resonant concept after we have *already lost it*. (..) home represents our hope for a segment of world that we can adaptively transform, our desire to find or create a place in the world where things speak to us, where they *have something to say to us*”⁸. (ital.orig.)

Looking at today’s world, we may conclude that we have drifted away from this desired situation; we have a “home” in an increasingly networked world – sometimes beyond our control – where the dichotomy between private and public space has become blurred, i.e., questionable and negotiable. We have outsourced the production/realization of our housing and therefore “disconnected” the relation and contact we have with this environment. When we shifted – some would say developed – from looking onto a map to determine our position and direction to looking on the digital/artificial image on the tiny screen of a digital navigational system, we lost our spatial feeling with the natural world outside; we are no longer in close (sensorial) contact with our surroundings, be it natural or artificial. We delegated or outsourced our “sense of place” and space to technology, to an instrument that more often escapes our control. As such, we reduce our experience and interpretation of the world outside the two-dimensional abstract image provided; we no longer construct or rely on our own image. Technology here constrains our creative and imaginative options to envision a world built on our own experiences. When it comes to building, it includes the close, human relation we have with the tools and means we possess to act as a “*homo faber*” (or maybe even “*homo ludens*”) to ensure we regain and maintain an active position in determining and shaping our lived space.

We also increasingly live and work in a world that seems to function based on control, while, at the same time, it seems to be to a large extent out of control, making it more complicated to provide the preconditions for dwelling. When [Theodor Adorno](#) stated that “*it is no longer possible to dwell*,” his conclusion was drawn from the horrific experiences in World War 2. Should we argue today that it is no longer possible to dwell, we come to this conclusion not because of that same experience but because a networked world – often beyond our control - offers us an alienated or false sense of security when the inhabitant is no longer the conscious active participant, in particular, where it concerns the (built) environment and its (digital) infrastructures.

⁸Rosa, H. (2020). The Uncontrollability of the World. Polity.

The contemporary situation of our “being on earth” can be described as an actual – but by no means new – problem; research illustrates again and again that we cannot continue the way we do, and creating a multi-faceted dilemma that has its consequences for, in fact, all aspects of our life and the way we occupy/inhabit the earth is most certainly one of them. As illustrated in Chapter 4, a wide variety of architects/artists has envisioned and designed the results of a fundamental rethinking of our society and (built) environment; many were sooner or later dismissed as being utopian, as unlivable. As argued in Chapter 4, the initial reasons for envisioning/creating different worlds originated mainly from societal visions often rooted in, e.g., radical political backgrounds; when Constant Nieuwenhuys created his New Babylon, he assumed that people would become nomads, wandering from one place to another without the “bore” of daily work diminished by automation. In Hilde Heijnen’s phrasing: “*New Babylon is the fictitious result of total liberation - of the abolition of every norm, every convention, every tradition, every habit. (...) It is a world in which the fleeting and transient power has acquired law, a world also of collective creation, absolute transparency and openness*”⁹ (transl.mp). As argued in the previous chapter, today, we can conclude that “absolute transparency and openness” will be judged by many as the inadequate answer of the need for privacy; also in Constant’s New Babylon, it ended in his inhabitants aiming for protection.

While the circumstances at those times were partially comparable to today’s times, there is a significant difference, i.e., neither of them lived and worked in a hybrid world; this rapidly transforming time in which the need for dreams, imagination, and creativity as well as the urge to act was as actual and pressing as today. Utopia, defined here as “eu-topia” or “good life,” thus, can be seen as an inspirational place, a place to be further defined and lived by its inhabitants. When [Anthony Vidler](#), in his 2007 lecture at the AA questioned “The Necessity of Utopia,” he referred to utopia as “a device for invention or radical intervention”¹⁰. When [Slavoj Žižek](#) argued for a new utopia, it is not for some far-away view of a society that is structured upon a set of circumstances thought anew: he argues for a “reinvention of utopia” out of an “urge for survival”¹¹. Despite the fact that his primary focus was/is capitalism/neoliberalism and not the built environment, both, however, are integral parts of the complex problem at hand.

⁹Heynen, H. (2001). *Architectuur en kritiek van de moderniteit*. SUN.

¹⁰<https://youtu.be/XM-QqN-P1BY>

¹¹<https://youtu.be/CbN7Kxv0r5M>

When, in 2003, Guardian journalist Jeremy Melvin commented on the death of [Cedric Price](#) (see Chapter 4) he stated – referring to, e.g., his “Fun Palace,” 1962 – that Price offered “*a focus to the optimism of the time, when it seemed possible to remake society around the potential for delight and opportunity.*” One could safely argue that today’s times lack a certain amount of “optimism,” which, however, does not exclude the need to “remake society around” any “potential.” When Shosaku Arakawa and Madeleine Gins created their “Reversible Destiny”¹² - project which ultimately included the “Bioscleave House” (completed in 2008), they aimed high by declaring that they created an environment that “would prevent death”; it was thoughtfully designated as “an interactive laboratory of everyday life.” Compared with, e.g., Eisenman’s House VI, it again questioned ingrained patterns and deregulated habits by completely turning familiar and traditional connotations upside-down, with the aimed purpose of preventing routine. The ways and means of providing our housing today “serves” the opposite; by building houses the way we – continue to – do, we frame our lived space in such a way that personal initiatives, individual influence, creative powers, as well as the unexpected are trapped in what third (commercial) parties believe to be adequate and appropriate. We do not frame our built space as an “interactive laboratory of everyday life.” Already back in 1969, Hugo Priemus defined dwelling (“wonen”) as “*interaction between people and the living environment*”¹³ (transl.mp), extrapolated for today: if that “living environment” changes according to, e.g., technological innovation, the “laboratory” changes with it, forcing us to contemplate the consequences, to rethink, and renegotiate our position.

One could remark that the examples mentioned above bring us half way; i.e., if we acknowledge that the current ways of providing a sense of spatial privacy, combined with the options to enhance our (built) environment, we need the awareness that living and acting within lived, hybrid space influences our identity. Living in the “infosphere” thus requires that we use our imagination, our creativity, and the means to turn these into freedom. In today’s times, we often seem to search for identity, for meaning, and for a sense of belonging; i.e., some prerequisites for dwelling. Where we should, in fact, aim for a contemporary attitude as well as one open to the future, we tend to “dwell” in the past. Paraphrasing [Rem Koolhaas’](#) words at the 2013 Triennale in Milan: we prefer comfort above challenge.

¹²<http://www.reversibledestiny.org>

¹³Priemus, H. (1969). *wonen, creativiteit en aanpassing*. Mouton.

Place and identity

As argued earlier, we are known — i.e., identified — because we have an address; usually physically via our home, sometimes theoretically, by, e.g., an IP-address or geo-locational via our smartphone. When we meet new people, one of the first questions usually is: where do you live, where is your home, or where do you come from? Identity, as Bibi van den Berg so extensively described¹⁴, has several dimensions. Briefly here, since this is not the appropriate platform for too much detail in this: first, identity means *sameness*, i.e., people can be recognized or distinguished as *individual people*; second, identity means *identification*; and, third, identity is a *process* (ital.orig.). We act/behave different according to the situation/location; therefore, place is an influencer/modifier of our identity¹⁵. Since we move through spaces/places and act accordingly, we should talk “identities” instead of “identity.” Instead of an (built) environment that is stable/inert, we will experience and act in a more hybrid environment that is becoming an interface; we, thus, interact with a sphere that influences/affects our identity. In the words of Bibi van den Berg: “*who we are is closely related to where we are.*” When our private space is no longer the protected sphere we are accustomed to we can either reinstall and protect once again or we can accept and rely on the fact that our environment protects us when needed/desired, i.e., without falling back on the classical traditional entity we call home. It implies that our identity — as means of identification — is no longer provided by the simple fact that we have an address, as is argued by Jeff Malpas: “*Rather than thinking of place in terms of identity, identity needs to be rethought in terms of place itself — which means in terms of place in all its complexity as well as its simplicity*”¹⁶.

Elaborating on both notions, complexity can be understood here as the sum-total of physical structures in close combination with digital infrastructures, providing a sphere in which we will need to discover/find our ways and — ultimately — our place. Simplicity can be understood as our elementary position as humans within a natural and artificial world; i.e., as long as we acknowledge that the former — complexity — is an entity added by us and for us, we can also become aware that the dichotomy of public (natural) space vs. private (home) space is an artificial one. If we consider architecture, i.e., the act of building as a continuous process in which we — try to — find our place and role, we may well achieve the awareness and agency

¹⁴Berg, B. van den. (2009). *the Situated Self; identity in a world of Ambient Intelligence.* (p.132)

¹⁵Note; see an actual interesting development on <https://disposableidentities.eu>

¹⁶Malpas, J. (2012). *Rethinking Dwelling: Heidegger and the question of place* (p. 18).

we require to “dwell.” As long as we believe that technology within the built environment is something that “happens” to us, we dismiss this agency; in the illustrative words of [Michel Sacasas](#): “*technological determinism is the product of cultural capitulation. It is a symptom of social fragmentation*”¹⁷.

This determinism rarely is topic of discussion in other disciplines/fields; e.g., the technical/biological innovations in health-care seem to find their ways without too much discussion, apart from those topics where it touches upon the primarily ethically based issues. Innovative technologies provide us with options to add artificial limbs and organs and/or modify our molecular structure; developments that will proceed to limits that we still do not grasp, let alone accept. When, however, this reaches our immediate environment (see, e.g., [Philip Beesley](#), [Marcos Novak](#), and [Lars Spuybroek](#)), we tend to reject/discard its options because we tend to feel uncomfortable with its results.

Searching for one’s identity in a hybrid world and an environment in constant change, thus, also implies the confrontation with and conscious “search” for the unexpected and the unfamiliar, with the accompanying precondition that we take back control and autonomy over what constitutes and guides this search as well as its findings. It means discovering the sphere that provides us the preconditions to dwell. Technology-prophets often argue the promises and advantages of (digital) developments; it makes a modern life easier, more efficient, etc. But, assuming we are look for Aristotle’s “good life” we “*should not relegate the discussions on what that is to private space*” (transl.mp), in the words, of Peter-Paul Verbeek in an interview¹⁸ a few years ago, to add at the end to believe in actions on a micro-level: “*interfere with everything.*” Given the importance of a good life as well as private space, I suggest we extent this interfering to our immediate built environment and the ways and means in which this is realized. This, however, requires the awareness that a hybrid world is a world we all occupy, inclusive of the ultimate desire to a have a “good life.” The next chapter will try to address this important issue.

¹⁷<https://thefrailestthing.com/2014/09/27/technology-will-not-save-us/>

¹⁸NRC-Handelsblad, 19/20-12-2015, p.18-19. (Wordt de vrije wil een illusie?)

“What will it be like to live in a world in which instead of conceptions being a dime a dozen, they are a dime for every hundred dozen or more? If the basic unit of concern is the body, not an abstract body considered apart from impulses and movement, but the body in action, then will not the concepts most central to living of a life be those formed – no matter how fleetingly – through architectural encounters?”¹

Shusaku Arakawa & Madeline Gins.

¹<https://www.tate.org.uk/art/artworks/merz-igloo-do-we-go-around-houses-or-do-houses-go-around-us-t05755>

10

Awareness and acceptance

“But I don’t want comfort, I want poetry, I want danger, I want freedom, I want goodness, I want sin.”

Aldous Huxley

“Can architecture be thought, no longer as a whole, a complex unity, but as a set of and site for becomings of all kind?”¹

Elizabeth Grosz

Initiating innovations and stimulating developments that touch upon the core of society tends to run the risk of limited acceptance if not properly – ethically – shared and discussed with civil society. Recently, a report by the UK-based think-tank ‘National Endowment for Science Technology and the Arts’ (NESTA) questioned: “how can civil society be more than a bystander in the 4th industrial revolution?”². A few years before, in 2013, the EC, in fact, questioned the same issue via another, primarily more broad, philosophical approach. It commissioned an international group of 12 scholars from various disciplines, chaired by philosopher [Luciano Floridi](#) to research the EC’s Digital Agenda and write an updated/adapted version to be based on human values. Next to this, an accompanying actual reason for this request was the upcoming election for a

¹Grosz, E. (2008). *Chaos, Territory, Art*. Columbia University Press.

²https://www.nesta.org.uk/blog/civil-society-and-fourth-industrial-revolution/?utm_source=e-mailnieuwsbrief&utm_medium=email&utm_campaign=AWTI+e-mail+alert

new EC-Board that needed to be philosophically and theoretically prepared for its four years' board-period to come.

This "collective thought exercise" was meant "in order to explore the extent to which the digital transition and the hyperconnected era we are entering into call for rethinking the concepts and referential frameworks on which policies are built." On February 8th 2013, the "Onlife Initiative (OI)" first outcome was presented in Brussels; six months later, on July 9th 2013, its summary, the "Onlife Manifesto"³, was discussed to discover the "blind spots," "make it more accessible for a wider audience," and to "draw concrete policy consequences." The report started by clearly summarizing the transformations that "shake established reference frameworks":

- a. the blurring of the distinction between reality and virtuality;
- b. the blurring of the distinctions between human, machine, and nature;
- c. the reversal from information scarcity to information abundance;
- d. the shift from the primacy of entities to the primacy of interactions.

It further concluded that "the current conceptual toolbox is not fitted to address new challenges and leads to negative projections about the future: we fear and reject what we fail to make sense of and give meaning to" (OI, preface, p.4).

The OI reports subtitle: "Being Human in a hyperconnected world" originated, to a large extent, in the works of Hannah Arendt who also emphasized the timeless value of the dichotomy between public space and private space. Floridi, in his entry, remarked that "*the distinction between public and private will probably need to be re-conceptualized, because frameworks based on physical boundaries are outdated conceptual models, insofar as they are linked to a modern or "Newtonian" metaphysics based on inert things and mechanical interactions*" (OI, p.12-13).

During the – sometimes intense - discussions on July 9th 2013, it became obvious that, since it is architecture (as in built environment) that frames and articulates space by creating "physical boundaries," it is also architecture that – so far – to a large extent, determines the traditional dichotomy between public

³Floridi, L. et al. (2013). *the Onlife Initiative*.

space and private space. Assuming we concur to the conclusion that this dichotomy has by now become more similar to a tangled web of diffuse relations between physical and digital environments, it may be necessary to rethink this complete environment and renegotiate our private space. This rethinking, I believe, should include the more abstract, playful, and other less rational issues that threaten to be forgotten when projected on a built environment based on control, surveillance, and data since our life is more than the sum-total of behavior and data. We should not strive for Max Weber's "Disenchantment" (orig. "*Entzauberung*,") we do need more dreams, imagination, play, and most certainly leave some enigma.

The OI concluded and paraphrased that when the concept on which we built our life changes due to, e.g., technological developments, we can turn a blind eye and dismiss the consequences or we can raise awareness and rethink the concept for a more adequate and contemporary edition. With a focus on the built environment, Alberto Pérez-Gómez emphasizes that "*conceptualization can only happen through the body, and since the body is the mind engaged in its environment, the qualities of this external reality matters immensely for cognition*"⁴

This concept, image or construct is for some years now subject to a series of creative innovative developments that cross the familiar borders of what once was defined rather easy and comfortably. E.g., 'the blurring of the distinction between human, machine and nature' (OI-b) is - in this context - most relevant; if we try to (re)define what constitutes our (built) environment we can no longer ignore wide-spread digital developments, in particular the rise of the Internet of Things/People. Although the OI does not specifically refer to the IoT/P it is the environment as an interface that blurs the distinction; i.e. where we once could rely on our understanding of the world and could 'dwell' we are now forced to rethink this world since 'being at peace' requires that we experience and - try to - understand the various complex worlds around us and accept the fact that its representations often do not run parallel.

When McLuhan, back in 1964, argued that "*Housing as shelter is an extension of our bodily heat-control mechanisms – a collective skin or garment*,"⁵ he could not define the technological developments that would facilitate a house as skin or garment. What he did envision was that both housing and clothing are "media of communication," together with adaptable spatial infill "*tending to the organic*." Nowadays, we are most certainly capable of creating a garment – think of, e.g., spacesuits – that serve as a full protection against

⁴Perez-Gomez, A. (2016). *Attunement, architectural meaning after the crisis of modern science*. MIT. (p.230)

⁵McLuhan, M. (1994). *Understanding Media*. MIT Press. (p.123)

the elements. At the same time, we can build exo-skeletons as an extension of our body, which allow us to perform tasks that are impossible without such an innovation. Think again of the OI's second item: 'the blurring of the distinctions between human, machine and nature'.

The physical space we call our home is considered a refuge, the place to retreat, the place to feel safe and unseen; in other words, a protective cell that is increasingly "developing" into its opposite. It forces us to contemplate its function, to reconsider its goals and redefine its ontology. "*If the house is no longer a concept, there remain only the complex relations between the attributes of dwelling, not 'dwelling' itself, or at least no dwelling as purely existential or natural category*"⁶, according to Meuwissen back in 1993.

Remembering the OI's background and as is also argued by the IoT-think tank Council while illustrating the digital transition: "There is no positive socio-cultural meme driving the potential of the Digital Transition"⁷. Unnecessary to add: our housing, as the familiar and traditional place to dwell, cannot escape this same transformative process; some 'socio-cultural meme' has to originate, preferably the constructive kind. As previously outlined (in Chapter 6), we have outsourced the development of our housing – and therefore most of our possibilities for dwelling – to third parties; we have reduced or abandoned our role as "builders" and the influence we should have on a topic so vital in our life. At the same time, we experience an increasing synthesis of built environment, digital (infra)structure, and the shift from a primarily analog to a more hybrid environment; a sphere as an interface. It implies that – in the framing of the OI – the concept of our lived space destabilizes, together with our attitude and behavior within. In previous times, we could rely on the fact that our home was a solitary, secluded and private sphere, a space to be free and unwatched. However, we still cannot discuss/decide based on much adequate research on our place/role within a hybrid world, despite what Dorien Pessers questioned already 20 years ago: "*What happens to man and his inner condition when the symbolism of privacy is lost in a transparent house*"⁸. Once more, this urges us to rethink the 'house' as we know it as the basic framework for our home.

Our dwelling and, therefore, our housing basically have little or nothing to do with technology in the sense of comforting functionality. Technology first functioned as a helpful and comforting domestic help, ready to act when necessary. When that same technology developed, it also articulated its role, i.e., from functioning

⁶Meuwissen, J. (1993). Houses of desire. *Archis*, 8, 65 t/m 80.

⁷<https://www.theinternetofthings.eu/what-is-the-internet-of-things>

⁸Pessers, D. (1997). House of the future, symbolism of the past. *Archis*, 8, 68–73.

in the background – see, e.g., Weiser – to a more prominent position that required motivated decisions from its users. In this: decisions related to functionality, privacy protection, to data collection; summarized: to its role and position in our life. The consequence of these choices so far also includes the unconscious choice for rationality, for less ambiguity, and less imagination. From a deterministic view, we accept the fact that technologies monitor – or even control – our actions and choices based on our lack of awareness and a desired sense of convenience or comfort, together with the traditional way of building housing, i.e., bereft of a sense of joy, imagination, and possible freedom. What remains is a framework that limits its inhabitant in fully experiencing a lived space that is part of our life. Instead, in the words of Juhani Pallasmaa: *“the task of art and architecture in general is to reconstruct the experience of an undifferentiated world, in which we are not mere spectators, but to which we inseparably belong”*⁹.

Art and architecture

Since, however, we began to realize that these choices are only the rational part of what can be chosen, we also become increasingly aware that the more abstract part cannot be ignored. The quality of our life is not measured in quantified data only; it is experienced through imagination, awareness, feelings, and actions. Architecture, in that sense, has the complicated mediating task of providing and facilitating the framework for an enhanced life. More in general, as argued by Elizabeth Grosz, *“At its most elementary, architecture, the most primordial and animal of all arts, does little other than design and construct frames; these are its basic forms of expression”*¹⁰.

While architecture, besides “primordial”, is considered “the mother of all arts,” it is – see chapter 5. – a constrained art, i.e., it needs a user/inhabitant – be it owner or tenant - who has a program of often rather rational and practical demands, latent desires, and abstract wishes. Every (interior)architect involved in the design and realization of private houses will recognize the sometimes complicated communication and confusing discussions that precedes the actual project since these wishes are not just some rationalized lists of practical items; envisioning the future house is not just the sum-total of construction, doors, windows, and a roof. With or without the assistance of an (interior)architect; we try to achieve a synthesis between ratio

⁹Pallasmaa, J. (2005). *The Eyes of the Skin: Architecture and the Senses*. Academy Press. (p.25)

¹⁰Grosz, E. (2008). *Chaos, Territory, Art*. Columbia University Press.

and emotion and between practical needs and desirable options for full experience and joy. What is needed, however, is the awareness that it is while living in a networked world it remains vital to recognize that its hybrid built environment with its accompanying ubiquitous technology is a possible synthesizer. One that requires an adapted attitude and, above all, participative action to ensure that it is the citizen/inhabitant that is empowered, facilitated by all means possible to control what determines and influences his/her private space.

The close link between architecture and art is also illustrated by [Christian Norberg-Schulz](#); in his ‘Genius Loci’ (1st. engl.ed. 1980) he argues: “Works of art concretize what remains “between” the pure objects of science. Our everyday life-world *consists* of intermediary objects, and we understand that the fundamental function of art is to gather the contradictions and complexities of the life-world. Being an *imago mundi*, the work of art helps man to dwell.”¹¹ (ital.orig.) Art, in a general sense can be considered one vital path to creating a more intense, other or even deeper understanding of (the concept of) our world by researching and showing what is ‘in between’. E.g., the [Ellen MacArthur Foundation](#) (aiming to built a future through the framework of a circular economy) ‘recognizes the importance of art in the creation of a future that is more inclusive, diverse and distributed’. In their recent article¹² ‘Without creativity no future’ (transl.mp) in the Dutch daily [NRC](#) Marleen Stikker and George Brugmans argue that ‘*technology is not going to save the world, we need help of artists en designers*’. (...) ‘*the cultural sector should play an active role in exploring and guiding the future.*”

Art, in a general sense, can be considered a way of creating a more intense, better, or other understanding of our world. A few years ago, the S-T-ARTS-project was initiated by the EC; on their website¹³, EU-Commissioner Oettinger states that “*In the digital age, art and engineering are no longer contradictory modes of thinking.*” Its project goals seek to:

- > support collaborations between artists, scientists, engineers, and researchers to develop more creative, inclusive, and sustainable technologies;

¹¹Norberg-Schulz, C. (n.d.). *Genius Loci: Towards a Phenomenology of Architecture*. (1980th ed.). London: Academy Editions. (p.23)

¹²<https://www.nrc.nl/nieuws/2019/06/14/zonder-creativiteit-geen-toekomst-a3963768>

¹³<https://www.starts.eu/about-starts/>

- > profit from the creativity and the critical thinking of artists to reflect on novel uses of technology and allow technology to be more seamlessly integrated into society.

It is tempting, given the current process of building and marketing housing, to exclude the realization of housing from the intentions mentioned above; after all, it would imply that part of the process should be delegated to the less rational disciplines/parties that so far have been excluded. On the larger scale – I will exclude here the few individual privately built houses – the entire process has no structural, incorporated place for the skilled and devoted craftsman, the deregulating artist and/or the concerned inhabitant. I consider this an anomaly; we do not build housing just to provide a roof over our head and/or keep the sector at work; the greater part of our life is lived within a space/place that serves the senses, the intimacy, the memories, the options to interact with – and not just in - that environment.

Art projects tend to follow an often less linear or articulate course compared to primarily technological projects, and scientists tend to act on more rational and pragmatic paths compared to artists. Art, in general, is much less “hindered or guided” by such limitations and can address and fulfill other, less pragmatic desires and questions and is capable of presenting the more overall, imaginative or even utopian plans. However, innovative technologies in materials, (bio)chemicals, and their digital counterpart lift that barrier and increasingly cause cross-disciplinary cooperation and results. If we look into some actual innovative technologies, we witness a series of developments – see, e.g., the EC.LIAR-project that deals with waste and energy management – that originate in biotechnology and nanotechnology which could be incorporated in or synthesized with our built environment. The result is not only a synthesis there but also a – possible – integration with the “arts,” facilitating other enhancing experiences. Consequence however is that the built environment - or more precisely the provided frame (see Grosz) - has no other role than to serve as such, i.e. besides its systemic structural function also facilitate functions and processes other than the pragmatic and practical demands only.

Constant’s New Babylon project was created on the basis of Huizinga’s “*Homo Ludens*,” man who could devote time to art, play, and creativity due to increasing technology and automation. (Extrapolated; 2013-research¹⁴ by Oxford’s Carl Frey and Michael Osborne conclude that 40% of jobs will be lost will be lost to computers in the next two decades) Many other projects (see Chapter 4) originated in broadly the same

¹⁴https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf

expectation and sought to translate those into a synthesis of art and architecture, of the analog and the digital, and of the real and the virtual. While many of us are often occupied in making their lives into a work of art, we are in our private space limited by created/provided borders to ensure we – need to – adapt, making us restrain of living the spaces we wish or need. Providing the framework for an environment devoted around experience requires an infrastructure that facilitates instead of dictates, one that leaves opportunity and space for individual participation and action as well as the technological and digital requirements to adapt/connect. In the words of Michael Fox: *“If an environment could adapt to our desires, it would have the ability to shape our experience”*¹⁵.

It is this requirement of a basic environment as an interface including infrastructure that is now - in part - in progress. Hence, the next chapter will deal with technology and the home.

¹⁵Fox, Mi. (Ed.). (2016). *Interactive Architecture* (p. 176). Princeton Architectural Press.

Central Iceland; according to plan, my progress to cross the island on foot from the south coast to the northern shores is about halfway. The center of the island is deserted: no mountain huts, no settlements, and no options for supplies. After hours of walking and crossing cold rivers, it is time to build shelter, prepare some food, and install for yet another night. I lower my rucksack and unpack my tent: a lightweight mountain dome constructed by sections of cable-connected aluminum poles and a nylon cover, with an inner rectangular tent suspended from the frame. Altogether, its weight is 2200 g; it is built up within 10 minutes. I search the environment for a suitable location, i.e., free of rocks and stones, dry, and as flat as possible out here. The tent is raised easily, and I take out a self-inflatable mattress and a burner; a small petrol-heated device that needs minimal fuel but can generate maximum heat. Next is my down-sleeping bag, almost 2 kg and adequate for the sometimes chilling nights. All of this is high-tech material, designed for circumstances like these, i.e., durable and lightweight. Together with necessary food for about 12 days, it would otherwise be difficult to complete the full crossing of the island; the sum-total of food, clothing, and other equipment would exceed the weight of what can reasonably be carried on one's back. The next mildly rainy morning, the entire process is reversed; after a nutritious breakfast and a big mug of hot tea, I pack all items under a dry roof, the last being a damp outer shell, and, within 15 minutes, I am on my way, leaving no trace of my presence but a square of flattened grass and fading footprints behind. This entire process of looking for an adequate spot, carefully erecting and securing the tent, installing mattress and sleeping bag, and acting vice versa the next morning has become a ritual but needs to be taken seriously; if not, I may experience problems when the weather turns bad or material is damaged. Thus, in a way, I relate my dwelling to the circumstances, my location, and my equipment.

11

Technologies and the home

“It will be possible to send anywhere or to recreate anywhere a system of sensations, or more precisely a system of stimuli, provoked by some object or event in any given place. Works of art will acquire a kind of ubiquity. (..) Just as water, gas and electricity are brought into our homes from far off to satisfy our needs in response to a minimal effort, so we shall be supplied with visual or auditory images, whitewall appear and disappear at a simple movement of the hand, hardly more than a sign.”
Paul Valery, the Conquest of Ubiquity, 1927

“Architecture is the art of reconciliation between ourselves and the world, and this mediation takes place through the senses”¹.
Juhani Pallasmaa

In 1950 cybernetics scientist [Norbert Wiener](#), hoping that people would be released by machines and could thus achieve more creative pursuits, after realizing the dangers of de-humanization and displacement, came to the conclusion that *“We are the slaves of our technical improvement. (..) We have modified our environment so radically that we must now modify ourselves in order to exist in this new environment”².*

¹Pallasmaa, J. (2005). The Eyes of the Skin: Architecture and the Senses. Academy Press.

²Wiener, N. (1950). Cybernetics and Society (p. 199). Da Capo. (p.46)

This statement should have been a clear warning then as well as continuously over the following years, also given the fact that a variety of thinkers/philosophers have questioned the upcoming technological developments and still continue to do.

Thirty years later, in 1980, [Jacques Ellul](#) argued that “*He (i.e., man, mp.) now is situated in a new, artificial environment. He no longer lives in touch with the realities of the earth and the water, but with the realities of the instruments and objects forming the totality of his environment*”³.

Another 16 years later when the digital options arose, in 1996, [Mark Weiser](#) and [John Seely Brown](#) wrote their – now famous – article: “The Coming Age of Calm Computing” in which they suggested: “*tie them (i.e., microprocessors, mp) to the internet, and now you have connected together millions of information sources with hundreds of information delivery systems in your house*”⁴. Today, over 25 years later, it remains questionable whether they could have envisioned the full implications of their proposal, in particular, where it concerns the parallel questions of ethics and privacy that are so deeply rooted and connected with our – future – homes.

In 1998, the term “Internet of Things” (IoT) was coined by [Kevin Ashton](#); and although a final adequate definition is still lacking – which makes an ethical discussion complicated, if not near impossible – it is vital to address its ontology since the lack of understanding, let alone full acceptance and implementation is still absent. While formerly addressed as “*ubicomp*” or “*pervasive computing*” (and simplifying the argument that the IoT is the connection of objects to the Internet) we do not do justice to its inherent complexity when it comes to possibilities and technology. Next to that, there is ample reason to address people as well, assuming we rethink the object–subject issue: hence an “Internet of People.” As [Gerald Santucci](#) already anticipated almost a decade ago: “*(..) by acquiring an identity as well as self-management, self-healing, and self-configuration capabilities, future interconnected and uniquely addressable objects will take the properties of subjects*”⁵.

³Ellul, J. (1980). *the Technological System*. Continuum. (p.38-39)

⁴Weiser, M., & Brown, J. S. (1996). The Coming Age of Calm Technology. Xerox PARC Retrieved July, 8(July), 2007. <http://doi.org/10.1145/633292.633457>

⁵Santucci, G. (2011). The Internet of Things; A Window to our Future.

Internet of Things platform [Postscapes](https://www.postscapes.com/internet-of-things-definition/)⁶ has gathered a wide variety of definitions; I will provide two definitions that, given the subject of this book, serve as the most relevant. The first one is by CERP-IOT:

“The Internet of Things links the objects of the real world with the virtual world, thus enabling anytime, any place connectivity for anything and not only for anyone. It refers to a world where physical objects and beings, as well as virtual data and environments, all interact with each other in the same space and time.”

The second one is by IERC⁷:

“A dynamic global network infrastructure with self-configuring capabilities based on standard and interoperable communication protocols where physical and virtual “things” have identities, physical attributes, and virtual personalities and use intelligent interfaces, and are seamlessly integrated into the information network.”

Ultimately, its most important topic is and will remain the ownership and control over (the exchange of) data; so, often linked to time, space, and place.

If we take a look at its actual development and future implications, we could note the following numbers and statistics: in 2020, about 30 billion objects will be connected to the Internet, increasing to about 75 billion in 2050⁸ (e.g., Vodafone currently connects over 85 million devices around the world that are *not* mobile phones (as of October 2019))⁹. According to “[the Economist](https://www.economist.com),” while referring to an eternal report: “One forecast is that by 2035 the world will have a trillion connected computers, built into everything from food packaging to bridges and clothes”¹⁰. In comparison, the current world population is around 7.7 billion people. The implication is that our (built) environment gradually turns into an information system, an interface; the threat of this consequence is that, so far, it remains unclear what our role,

⁶<https://www.postscapes.com/internet-of-things-definition/>

⁷http://www.internet-of-things-research.eu/about_iot.htm

⁸<https://www.statista.com/statistics/471264/iot-number-of-connected-devices-worldwide/>

⁹<https://www.vodafone.com/business/news-and-insights/blog/gigabit-thinking/iot-will-propel-small-and-medium-businesses-to-the-top-of-the-digital-economy-here-is-how>

¹⁰<https://www.economist.com/leaders/2019/09/12/how-the-world-will-change-as-computers-spread-into-everyday-objects>

our position, and, above all, our agency/influence is. Also, where and how we live in/interact with an (built) environment that is no longer inert but “active,” i.e., responsive, informative, and possibly determining, still is not clear. In the words of William Mitchell, back in 1996: *“Rooms and buildings will be seen as sites where bits meet the body – where digital information is translated into visual, auditory, tactile, or otherwise perceptible form, and, conversely, where bodily actions are sensed and converted into digital information”*¹¹.

Essential in this is the (assumed) synthesis of digital and analog, of real and virtual, and of physical and non-physical. Accustomed and familiar as we are to (built) environments that seem to be “passive/non-responsive,” we experience a change in what constitutes a traditional sphere. It is the false distinction between elements that are – and will increasingly become – fully integrated within our (built) environment, providing an intuitive, tactile sphere. After all, in its original envisioning, it was intended to be “pervasive computing” or “ambient intelligence” in the first place. While, within current parameters, there still is no such thing as the “digital home,” it is the transformation of the environment into an interface, a structured “system of systems,” that requires another approach or another attitude. The unavoidable question here is whether we should rethink the current dichotomy of private space vs. public space, of a space that is physically accessible but, in addition, appropriate to facilitate and protect our privacy without its current physical translation. Rephrased: can we think and experience – a sense of – dwelling without its traditional (built) connotation? Can we (re)define principles of spatial privacy – and therefore home – without having to realize a building in its current physical shape or form?

A contemporary, modern building already consists of an increasing amalgam of various technologies; besides the (often complicated) built structure in itself, it incorporates the systems to control/monitor the structure and provide information on climate-control systems, security, media, etc. So far, these (digital) systems are incorporated within a fixed/inert physical structure, while, at the same time, they increasingly – seem to – merge; the entire building seems to develop into an “intelligent” building, providing the question whether we end up with a fully digitally/artificially controlled environment. Technologies, including the IoT – assuming we stop framing it as a technology in favor of a concept – can bring us closer to experience, to our environment, to all elements that frame, determine, and influence our “place in the world.” In the phrasing of [Marcos Novak](#): *“We already inhabit an invisible world of shapes, an architecture of latent information that is modulated by our every breath and transmission. The shapes*

¹¹Mitchell, W. J. (1996). *City of Bits: Space, Place, and the Infobahn (On Architecture)*. The MIT Press. (p.105)

are definite, and with the right tools of sampling and visualization, can be seen, captured, and, if so desired, manufactured."

In the previous chapters, I have argued that the current, traditional way of providing the framework for housing over, in particular, the last 50 years was and still is inadequate: it is inflexible, unsustainable, as well as a completed product created by third parties without the active involvement and/or participation of the inhabitant, be it the first or the last. Technological developments and innovative solutions provide us for years now with abundant opportunities to adapt and change the building system and its products, assuming the entire building chain acknowledges and accepts the fact that a fundamental shift is inescapable, not for the sake of change as such but for the sake of the interest of the entire chain, including the inhabitant and therefore the well-being of the community as a whole. In 2013, [Tomasz Jaskiewicz](#) anticipated: *"What all possible scenarios of interactive architectural future have in common, is the increased role of inhabitants in formation and transformation of architectural habitats. Beyond doubt, the future of architecture is participatory, focused on enabling people to form and improve the spaces in which they live their lives"*¹².

As illustrated (in Chapter 4), it is practically impossible to create only individual housing for individual people. We have surpassed the moment that we can all acquire a single (one-family) house with a front and back garden and a carport, assuming this ever was a realistic and well-considered aspiration. The sheer number of people living in cities will – so far – only increase, and the surface alone required to provide everyone with even a "tiny house" is simply not enough. Even if there would occur an envisioned returning to the countryside (see, e.g., Rem Koolhaas' recent "[Countryside](#)" research), we cannot answer for the wish that everybody – in particular in the western world and/or other densely populated areas – will be housed individually, together with his/her own self-supportive piece of land.

Answering the housing issue implies answering its unavoidable accompanying issues, i.e., urban structure, built infrastructure, energy, and sustainability. A "simple" example illustrates this situation: to answer the upcoming reduction in energy usage and the output of CO₂, the Dutch Government has decided in its Climate Agreement that by 2050, the entire housing-stock has to be preserved and gas is expelled from

¹²Jaskiewicz, T. (2013). Towards a methodology for complex adaptive interactive architecture (2013th ed.). Technical University Delft.

our housing, meaning that by 2020, no newly built house will have a gas connection and starting in 2030, adaptation is realized to shift from low-calorie gas to high-calorie gas. This concerns individual housing where it would be far more economically achievable/realizable – and most probably cheaper – to apply and integrate these changes on a larger scale, i.e., adapt a system providing the option for a series of options for varied housing instead of each house individually. Each year, around 20.000 houses need to be replaced; large quantities of houses need to be adapted to address the new energy transition. It seems almost impossible to realize this within acceptable amounts of costs for owners as well as tenants.

When, in 2010, the French architect [Philippe Rahm](#) argued: *“When we feel that we are too cold or too warm, we typically find external causes, such as the climate (at an atmospheric level), and we respond with attempts to correct them. From an anthropological point of view, this could be considered the origin and the mission of architecture. (...) Architects should no longer merely build spaces, but rather create temperatures and atmospheres”*¹³. Translated for the larger scale: creating the prerequisites – e.g., Grosz’ frame – for multiple housing, keeping in mind that issues like sustainability, adaptability, flexibility, and climatic conditions should prevail, extensive open structures will be preferable instead of individually constructed housing.

Systems and open systems

“Whole Earth Catalogue” writer [Steward Brand](#) once described the framework of housing as the “6-S” systems, i.e., from the outside inwards: *“site, structure, skin, service, space-plan, stuff”*¹⁴. The more inwards we define, the shorter its lifetime and the more flexible we become. Separating the individual from the collective creates the possibilities to separate common structure from individual infill; i.e., the collective is the framework that remains intact over time, the individual part is what is flexible, adaptive, and personalized. It also provides the opportunity to address the circular principles of a sustainable built environment, to address the lifecycle of materials, and to provide an architecture – a system of systems – that facilitates flexible reuse. I repeat: this is by no means a new paradigm; back to John Habraken and his, by now about 50-years-“old,” Introduction¹⁵ on Open Building:

¹³Hauptmann, D. (2011). *Cognitive Architecture. From Bio-politics To Noo-politics*. 010 Publishers.(p.387,391)

¹⁴Brand, S. (1994). *How Buildings Learn; What Happens After They’re Built*. Viking.

¹⁵<https://www.habraken.com/html/introduction.htm>

Open Building is the term used to indicate a number of different, but related ideas about the making of environment.

For instance:

- ⊙ The idea of distinct levels of intervention in the built environment, such as those represented by “‘support’ support” and “‘infill’,” or by urban design and architecture.
- ⊙ The idea that users / inhabitants may make decisions as well.
- ⊙ The idea that, more generally, designing is a process with multiple participants and also different kinds of professionals.
- ⊙ The idea that the interface between technical systems allows the replacement of one system with another performing the same function. (As with different fit-out systems applied in a same building.)
- ⊙ The idea that built environment is in constant translation and change must be recognized and understood.

The website of the Dutch organization of building companies “[Bouwend Nederland](#)” seems to recognize the problem at hand, but transforming theory into real practice seems to remain a challenge: “From their role in the chain, primary construction companies can further reduce the use of raw materials. This by designing buildings with: lighter structures, usable for multiple functions and easily demountable after demolition. Separate and minimize construction and demolition waste. In addition, material that is as sustainable as possible can be used” (transl.mp).

Today’s ways of building housing, however, still does not imply – i.e., on a larger scale – the use of “lighter structures,” does not incorporate “multiple functions,” and is hardly “demountable.” Much has to do with the initial design and ways/means of building; e.g., where we were used to hardware (physical) infrastructural systems, we move toward the less visible digital systems. If we recall Open Building’s last item: “The idea that built environment is the product of an ongoing, never ending, design process in which environment transforms part by part,” we also need to be aware that a transforming environment will – for decades to come – be structured along a built (physical) entity that provides the preconditions for this “never ending process”; one that will be(come) a hybrid of the real and the virtual and the digital and the analog. Ellul’s “totality of the environment,” together with certain indeterminacy, will continuously remind

us to be aware that we are part of a sensory environment – a frame – that lacks a *genius loci*. It is, in a sense, open, unarticulated, and random but provides its inhabitants the means to add that *genius* in such a way that it enhances atmosphere, experience, and quality as well as agency: connectedness when needed or desired. As thoughtfully phrased by Elizabeth Grosz: “(..) *the construction of territory is the fabrication of the space in which sensations may emerge, from which a rhythm, a tone, coloring, weight, texture may be extracted and moved elsewhere, may function for its own sake, may resonate for the sake of intensity alone*”¹⁶.

Where early projects originated in too often premature innovations, anticipated technology, or a desired focus on flexibility/adaptability, these topics now can join forces; technological developments today and tomorrow facilitate what decades ago was only anticipated or envisioned. This is not “limited” to digital developments; e.g., more precise tools in close combination with improved machinery facilitate larger numbers of standardized/modular elements, thus decreasing prices. At the same time, many materials – be it for building or for infrastructure – are tagged, i.e., recognizable and traceable¹⁷. Summarized: where we so far considered a series/area of houses as the sum-total of individual buildings with all limits of their own infrastructure and technologies, we now can think of an up-scaled overall structure that is functioning as a protective and sustainable entity as well as providing individual freedom, i.e., the true prerequisites for open building. In Carlo Ratti’s words (on open-source architecture software): “*A tipping point is approaching that posits architecture as information and brings empowerment through fabrication*”¹⁸.

The sensory environment – the interface – is enhanced, made possible, and accessible by “technology”; it is the extension of our environment now shared with a variety of objects connected digitally and individually. As Floridi noted: we now live in an “infosphere”; we are – and will increasingly become – an active, participating element in a continuously changing environment. It forces us to think the consequences, not only for us as inhabitants but also those concerning sustainability and circularity; the focus of the next chapter.

¹⁶Grosz, E. (2008). *Chaos, Territory, Art*. Columbia University Press.(p.12)

¹⁷See, e.g., <https://www.oogstkaart.nl/about/>

¹⁸Ratti, C. (2015). *Open Source Architecture*. Thames & Hudson.

a garment and no more?

And heavenly it had been so long as it was a garment and no more
(from E.M. Forster, *The Machine Stops*, 1909)

in this thought-dance, I start from the idea of technology as clothing, or vice versa, one of the many means by which we survive, including theory, cultural patterns, and communication in the moment.

when I first learned about domotica as a field of interest, I immediately thought of a scenario where a house made sentient with electronics falls fatally in love with the inhabitant. there are many degrees of such connectivity. in popular fiction, one only needs to think of scenarios such as the quoted short story *The Machine Stops*, the *Matrix*-Trilogy, or the fictional Borg from *Star Trek*, where the technological garment is surgically made part of the organism via implants and injected nanoprobes altering the very DNA, while “Resistance is Futile” the more invasive a technology becomes, the more fatal the case of error, unforeseen situations.

what if an entirely different goal becomes more attractive, having a sense of successfully having completed a previous stage of existence?

at the end of *The Machine Stops*, the central human protagonist escapes her disintegrating room into life because the door handle from her cell appears independent from the electricity net, and because her muscles apparently have not been so disused from sitting in her chair or sleeping on the summoned bed, she is still able to move in time, before the cell structure collapses behind her ...

Thomas Körtvélyessy
Dancer/choreographer/thinker

12

Sustainable: circular, modular, nature-inclusive

“If the task of architecture continues to be the interpretation of a way of life valid for our period, where do we find the measure of such validity? (..) what kind of dwelling is appropriate to this technological age?”¹

Karsten Harries

“You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.”

Richard Buckminster Fuller

In November 2019, the Dutch Government announced the first in a series of – in part radical – measures to reduce CO₂-emissions in the Netherlands; many of them with the accompanying justifying reasoning that it was necessary to ensure that the “much needed” building of housing could be continued as usual. It may very well have escaped my attention, but I cannot remember having heard or read any critical remark at the same time about the process and means of building these houses, given that this practice is, in itself, part of that same CO₂-emission problem. Also, I cannot remember any serious discussion about the reasoning as such; two items were connected where, in fact, there was primarily a reason of overall sustainability.

¹Harries, K. (1997). *The Ethical Function of Architecture*. MIT Press., p.12

Additionally, recently my mailbox contained a digital newsletter from a Dutch building organization, stating that our commodities run out and therefore we need new ways not to spoil them. This, I believe – in both examples – is the wrong reason as well as the wrong order: we should not spoil our commodities in the first place, not because we have utilized them for decades but because their supply is simply not endless. We should not start thinking circular and/or sustainable alternatives because we believe or conclude that we run out of alternative options.

Numbers and percentages

As argued in a previous chapter, our current process of building housing usually is a linear process; we start again each time by designing a next series of housing, prescribe new materials, use these, and dispose of them at some point in time when a renovation, redesign, or even demolishing occurs. To provide only a few numbers here, the building industry is responsible for 50% of the commodities worldwide, while only 2% of the earth's surface is covered with urban areas. The complete construction and building sector accounts² for 25%–30% of all waste in the EU; the worldwide use of concrete is 1.4 m³ for each civilian, each year³. The industry involved is responsible for 5%–8% of the CO₂-emission that makes it one of the biggest polluters. Its use in the – housing – building industry requires a formwork, using plywood that has to be “constructed” in advance to be removed/destroyed after pouring the concrete, causing double work and ultimately waste.

A daily walk on the streets in an average neighborhood and looking at the various contents of a waste container on a building or renovation site seems illustrative enough for the fact that the building sector is responsible for 40% of the waste – about 24 million tons – in the Netherlands (moreover, as well as for 40% of the energy consumption). When an average rented house owned by a corporation is renovated, usually due to a new tenant, we are left behind with an average of some 5 tons of waste. Although the claim is that, by now, the greater part is being recycled, it should be clear that both the system as well as process are in serious need of real change. Like the actual parallel discussion concerning plastics, if it is not really needed, hence, produced in the first place, there is also no need for – too

²https://ec.europa.eu/environment/waste/construction_demolition.htm

³<http://www.cementenbeton.nl/duurzaam-bouwen/cement-en-co2/co2-top-cement>

often expensive – recycling. The problem with the current system of re-use is acknowledged: for a really adequate circular system, the quality of many materials often is not good enough, the variety of materials is too large, and the numbers too small; therefore, the options for re-use elsewhere will be limited. So far, it is a rather poor solution for an obsolete process that in itself is not designed and exercised as a sustainable/circular process.

This is also due to the fact that all projects are different: different in design, in setup, in volume and surface, and in construction and finishing. Each new project starts from a *tabula rasa*; practically, each new project covers a (series of) complete house(s) instead of providing a basic framework or support for further personal/individual infill, be it (in part) standardized and prefabricated or not. Together with the usual practice of having our housing designed by architects, the consequence of this line of producing housing is an ever-present variety and complexity, also due to ever more complicated (technology) regulations. Thus, first, the costs of producing each house anew remain – too – high, and, second, too many materials used because of these costs are often inferior and/or short-lived. In the end, both project developer and builder/contractor have “delivered” and are no longer responsible or accountable for choices made as well as for the ultimate result. Research⁴ conducted by the “Dutch Vereniging Eigen Huis” over 2018 concluded that, on average, 21 failures/mistakes occur when the house is to be delivered; they conclude that this is caused by a mixture of limited professionalism, small margins, and shortage of materials.

A recent report⁵ by ABN-AMRO illustrates the problem: “If the building structure offers the possibility to adapt to the requirements of the time or to change function, many of the original investments retain their value. Longevity extension of object and product, re-use and re-duce, has a huge impact” (transl.mp). However, a structure that offers the “possibility to adapt” requires a certain flexibility, not a rigid inert system that cannot change functions.

We still do not consider a house as being part of a standardized and industrialized system that supplies the prerequisites for a variable, adaptable living space; we design and build individual housing for individual inhabitants, based on requirements described by (building) regulations and the (commercial) demands

⁴https://www.eigenhuis.nl/docs/default-source/downloads/actueel/opleveringsgebreken_juni_2019.pdf?sfvrsn=3b9ade96_0

⁵Alles van Waarde ABN-AMRO, Nadia Menkveld et al., juni 2017.

described by the project developer or corporation. Both address only a specific group of inhabitants, i.e., each “market” is defined in terms of what the aimed “target-group” of inhabitants is assumed to prefer, wish, need, and require. However, as illustrated so adequately in John Habraken’s words, back in 1967, “The simple truth is that the everyday cannot be created *for* a society, but only originate *from* that society”⁶ (transl.mp, ital.orig.). That is, a society in constant change, and that change should also be expressed within the design and realization of the built environment as well as creating/supplying the parameters for changes in the longer term. The longer the lifetime of a building – and that period is still increasing – the more flexible/adaptable it should be.

A system of re-use, in particular, will serve and function at best when utilized in a (geo-located based) system of more or less standardized structures, prefabricated, and registered elements. Also, a standardized – modular – system utilized within a common, flexible framework “guarantees” to a certain extent that what is used will fit at each and every location and can, therefore, be industrially produced in large quantities and – if needed – in a variety that facilitates individual usage and personalized expression. Standardized uniformed systems also provide the basics for a large amount of individualized infills, infrastructural services, personalized layouts, etc. But where there is no urge or need for individualization, systems can be uniform, and, hence, cheap but solid, hence, circular/sustainable. A system like a standardized material passport can register all elements and ensure all are recognizable, traceable, and re-usable. As [Thomas Rau](#) argues: “*Never again will a building be built without any thought about how we can dismantle the building materials*” (transl.mp).

When designed and realized as standardized and/or modular system, infrastructure can be incorporated in a likewise way, ensuring an adequate uniform connection when it concerns, e.g., water and electricity instead of the traditional practice of ever-changing connectivity locations, sources, and connections at places where there is no proper use for them (see, e.g., the usual electricity supply in the middle of each room-ceiling, being the exact place where it is not needed). What is thus conceptualized is an open system, a way of providing the framework for housing in such a way that the everyday practice within the home is determined and shaped by those who are “entitled” to do so, i.e., the inhabitant.

⁶Habraken, N. J. (1967). *het Alledaagse*, over het ontstaan van de omgeving van alle dag. Lemniscaat.(p.9)

An international platform like **BREEAM** that aims to cover sustainability issues and provides certificates is, to a large extent, so far focused on utilitarian buildings, not on housing. At the same time, the options for modularity and standardization in that sector are far more promising; after all, housing is, because of its numbers, a substantial part – near 50% in the Netherlands – of what is built. A parallel EC-project like **LEVEL(s)** is “a voluntary reporting framework to improve the sustainability of buildings. Using existing standards, LEVEL(s) provides a common EU approach to the assessment of environmental performance in the built environment. It will help transform the building sector aiming toward a circular economy.” It is now in the registering/inventory phase and due to report in summer 2020.

An EU-funded project like **BAMB** (“Buildings As Material Banks”) aims at “creating ways to increase the value of building materials” and develops a material-passport as “a one-stop shop for material information.” The Dutch “**Oogstkaart**”-project, a “market-place for professional upcyclers,” provides a geo-located inventory/overview of (building) materials available.

When it comes to sustainability, the advantages of a large-scale structure seem clear. Recent research shows, e.g., that “Compared to a standard single-family home with an average of an environmental performance of 0.50, the environmental performance can quickly decrease in very small homes. On the other hand, the environmental performance will increase as the gross floor area becomes larger”⁷ (transl.mp). The same is true for the component that has the most significant influence: installations add up to a third of the influence on environmental performance; therefore, the result of adapting there will be the most valuable. According to Milieudatabase⁸, this can be increased up to 45% for a zero amount.

The conclusion seems obvious: when permanent parts of the building, i.e., construction, façade, and installations are designed and structured in such a way that they are “separated” from the further individual housing/infill and designed to be/remain sustainable, the profit in terms of performance will be substantial. Additionally, the need for complete individual installations – e.g., heating or ventilation – will be reduced as is shown in various cities using common/district-heating systems. Currently, only about a half-million households out of some 8 million are connected to “district-heating” (“Stadsverwarming”) systems.

⁷<https://milieudatabase.nl/bijeenkomst-lca-specialisten-januari-2019-2-2-2-5-4-3-2/>

⁸<https://milieudatabase.nl/woningontwerp-en-milieuprestatie/>

New guidelines by the Dutch Government require that by 2030, houses need to be built 50% more environmental-friendly compared to today. In 2050, all building should be fully circular; but the road ahead seems “long and unruly.” Curiously, as well as fully incomprehensible new, housing does not have to answer the Paris climate agreements. Recently, the Draft Climate Agreement (Ontwerp Klimaat Akkoord or OKA) was produced in the Netherlands; the Economic Institute of Building (EIB) states in her recent report⁹ that the OKA uses “incompatible starting points” by assuming that an ambitious sustainability policy will synchronize with neutral costs for households/citizens. The EIB also concluded that the costs of making the current supply of housing “almost energy-neutral” will amount to €30.000 – per house, i.e., a total of 230 billion euros. Next to that, very recently a Dutch Commission researching the problems with CO₂ stated in a first advice, referring to the building sector: “The Advisory Board is of the opinion that profit can be gained in the construction sector through modular, energy-neutral, circular and nature-inclusive construction and through better use of innovative techniques and materials”¹⁰ (transl.mp). Once again, this is once more a repetition of moves: remember, e.g., the VROM-report dated back in 1994; see Chapter 6 on Housing.

In 2005, [Michelangelo Pistoletto](#)’s “Third Paradise”¹¹ project was presented at the Venice Biennale; its “basic idea is the overcoming of the current worldwide existing conflict between the two polarities of nature and artifice.” In a series of workshops, its emphasis was recycling and environmental sustainability, architecture being a substantial element in this. It is a continuing project up till today, incorporating the arts and other disciplines involved. In line, I believe it is a serious mistake to assume that problems concerning a more individualized and participatory system of (building) housing, together with issues of connectivity, sustainability, and circularity can be addressed without incorporating the deeper fundamentals of our ways and means of conceptualizing and building this housing. Rephrased and summarized: thinking about these issues cannot be isolated from the building chain as a whole or from society; it is part of the system as a whole. It is much like the current situation concerning climate change and our options/choices for fundamental change: if we limit choices to the less radical, less disruptive, and “easy” options, we may only solve part of the problem and believe we can achieve results without too much discomfort and disruptive consequences for the entire sector involved.

⁹Klimaatbeleid tegen het licht. (2019). (p.12)

¹⁰Report ‘Niet alles kan’, 25 sept.2019

¹¹<http://terzoparadiso.org/en/what-is>

What, however, should be reminded is the fact that it is only a minor percentage of housing that is added to the supply; the vast majority is existing housing that too often is in need of a series of measures, ranging from switching from gas to electrics, adding double-glazing, isolation in roofs, walls, and floors; sometimes though a merging of two houses given their limited size, or even a full demolishing. It raises the recurring questions with regard to social issues vs. sustainability and/or technological issues; i.e., where is the turning point to decide whether it is more socially/economically justified and responsible to renovate or to rebuild. Where – in the example referred to in the introduction – a choice could have been made to extend the existing situation instead of renovating entirely, the “choice” today is made for us and by us: we have a serious environmental problem and as one inescapable but logical consequence, we need to act in line with the “Paris” agreement and its guiding framework, with its ultimate date.

Essential in this is also the fact that, while some 20.000 houses are in need of demolishing, the call for a more social, small-scale participatory approach is heard. Recently, a small group of tenants in Rotterdam celebrated their victory in court over a corporation that planned to demolish their housing and replace it for a mixture of other typologies next to rented ones. This “victory” may well develop in disillusion since, ultimately, this process will repeat itself and the same issue will rise again; the background (social) framework and the entire building chain remains the same. It is illustrative of the complicated situation of our existing housing supply; one that is, in part, due to the – often semantic – discussion concerning the “quality boost” as a main reason for the corporation involved to proceed. It is often the current inhabitant who is excluded from the process and ultimately has to move where a more socially substantiated solution should be preferred, to the benefit of the entire neighborhood as well as keeping valuable social structures intact. As said before, there is no level-playing field. As long as the building chain as a supply system – be it for owners as well as tenants – is steered by commercial and rational (market) arguments, there is no emphasis on, e.g., sustainability and circularity principles first.

It should be obvious that, primarily, the housing that is added to the supply should be subject to the entire range of options available to ensure we build sustainable, circular, and flexible. It is also obvious that given this amount, we will need several decades to re-organize our supply of housing and answer the increasing urge for a more democratic process. At the same time, should we “limit” ourselves to providing the framework, i.e., the basic structure, and concentrate on its durability and flexibility, we most likely end up re-organizing faster, cheaper, as well as more adequate.

Building the structure

As illustrated in Chapter 5 by the text of [Dom. van der Laan](#) “*we extract architectural space as an emptiness out of natural space,*” i.e., before we start to build, there usually was “nature” of some, maybe artificial, typology. A recent call by a great number of professionals and researchers to build “nature-inclusive” – with reference to the Remkes-report – is signed by a variety of companies and institutions involved primarily in environmental research where it should, in fact, be signed by a great many companies participating in the building sector as well.

This comes with the responsibility of returning/incorporating “nature” before, during, and after building; i.e., to design and build sustainable from the tender on, which so far still is a non-existing – let alone obligatory – (pre)condition. For example, by building one of today’s large distribution centers or office buildings, 10.000 m² of “nature” is extracted so far without the obligation to include a green roof, often refused because we do not want to hinder (economic) initiatives. If we build any kind of building, including housing, this should go hand-in-hand with the obligation to “return” what is taken from nature.

It is, back to the introduction, an important element within the need expressed by, e.g., Andy van den Dobbelsteen from TU-Delft Climate Design & Sustainability in a recent [interview](#) in Cobouw, in which he states that when it comes to sustainable building, we have passed the moment of just desiring, we now have to. He urges for the need to build nature-inclusive, as integrated part of sustainable building and argues as well that we live in a time of change and therefore should stop building without taking risks, support those companies that are innovative and initiate/start a project/test-case in which the housing area of the future can be built. It is therefore all the more remarkable that in a recent plea signed by a number of companies and organizations – “The Housing Alliance, a plea to invest out of the crisis with future-proof housing” (dated June 18th 2020) – there is no articulation on what it is that should be build; it is a plea for “building, building, building.” It states that areas should be developed that become climate-adaptive, nature-inclusive, and circular “as much as possible.” It strives for “a realistic and very ambitious level of quality” concerning use-value, future value, and amenities, all however without any articulation how to realize this without the much needed paradigm-change.

The next chapter addresses the actual developments in this reorganization and tries to envision a possible future.

“A design for commoning, for living together locally in a globally connected world is the new challenge. For this to happen, policy needs to find new ways of presenting its data and information. Instead of talking about solidarity, it should talk about friendship. Instead of talking about profit, it should talk about sustainability. Instead of talking about sustainability, it should talk about the trades and the quality of work of artisans and small entrepreneurs. And they love the feel for their material. It should get rid of the essay, the report, the document. It should reduce the cycle of producing clear information for SME and lone entrepreneurs by adopting rapid prototyping and “demo or die” research strategies. It should plan, provide and pay for the infrastructure as broadband and wireless have become basic human rights, not outsource infrastructural demands to an open market.”¹

Rob van Kranenburg, 2009

¹Kranenburg, R. van; S. D. (2009). *The Internet of Things*. Institute of Network Cultures.

13

Actual developments and possible futures

“If the wind starts to blow, swarms of leaves turn out to be subtle bio-engineered robots that harness that very wind to propel themselves into an emergent shelter that surrounds you.”¹

Jaron Lanier

“How can the new tools available to the architect bring people together - not only inhabit, but to change, augment and ultimately create the environment around them?”²

Carlo Ratti

For some years now, the broad “technology” discussion is – finally – focusing more intensely on the ethical and social questions concerning the “infosphere.” Previously most digital developments surpassed the important questions of acceptance and implementation; i.e., to which question was an answer formulated and answered. With the rapid intertwining of the analog and the digital and of the real and the virtual, it became abundantly clear that the possibility to escape from the “infosphere” was next to zero. The granularity of (future) digitalization provides a world that requires an adapted attitude, based on a deep, well-thought, and appropriate understanding of what it means to live in such a sphere. This thanks to, e.g., Luciano Floridi who argued that *“The infosphere will not be a virtual environment supported by a genuine ‘material’ world. Rather, it will be the world itself that will be increasingly understood informationally, as an*

¹Lanier, J. (2013). *Who owns the future*. Allen Lane. (p.9)

²Ratti, C. (2015). *Open Source Architecture*. Thames & Hudson.

*expression of the infosphere*³. I say, finally, because over the previous period as well as sometimes today we experience an increase of – sometimes innovative – digital products, services, and technologies simply because it is possible. We did, or often do not, question the “why,” we question, in particular, the “how.”

Focusing on the built environment, it implies that we encounter some significant issues concerning the fundamental difference between existing and future buildings and, because of that, the possible implementation of innovative technologies, be it for basics or for infrastructures. Remembering various utopian projects, e.g., Constant’s [New Babylon](#), Ron Herron’s [Walking City](#), or even the more recent Lars Spuybroek’s [Son-O-House](#) (mentioned in Chapter 4), we witness some strange objects and environments that have no visual resemblance to what we – think we – know; their appearance is alien to us due to shape and form, i.e., due to a changing ontology. Even in the latter case, though, this is a reality, it is real and it is built. I believe this alienation is caused by the fact that our traditional – say nostalgic, maybe even romantic – view of what constitutes our house causes the rejection of other, more future appearances. We seem reluctant, maybe even incapable to embed the *infosphere* into this view because we have no embodied experience – let alone knowledge – of what it means to live and, above all, act within such an environment. That is by no means to argue or suggest that we can only dwell if we accept all consequences of such a sphere but that we need to acknowledge that the world as we – think we – know it is changing and that we should not turn a blind eye. We do need to incorporate, with a positive but critical attitude, its constructive and imaginative possibilities; also concerning architecture and also, therefore, our housing. At the same time, however, it concerns an artificial sphere intertwined with a natural world, and, by now, we have come to the conclusion that we need to live – and therefore dwell – within this sphere, with respect for both nature and human values.

When [Paul Virilio](#), looking ahead, came to the conclusion that “*Something will affect the building in its very persistence, the resistance of its materials, the duration of its immediate efficiency. It will become less than a decor - a form-image as unreliable as a mirage*”⁴, he sounds theorized far away of today’s brick-and-mortar principles of realizing our housing. The fact that many prefer traditional connotations where it concerns (the architecture of) our housing instead of incorporating “modernity” in all its aspects is in itself ample proof of the rejection of certain aspects of that same modernity. We accept most technological developments in case of comfort issues but not in the case of architectural design, let alone disruptive changes in functionality.

³Floridi, L. (2014). *the 4th Revolution*. Oxford University Press. (p.50)

⁴Virilio, P. (2012). *Lost Dimension*. Semiotexte.

Modernity, in [Jurgen Habermas'](#) words, is “an unfinished project” and the question remains whether this should not be true for our housing as well.

If we summarize and try to address the main reasons for fundamental change in the way we envision, design, and build our housing, we can conclude that three issues rise to the surface:

1. For decades now, it is acknowledged by many that the current process of building and supplying housing is inadequate: it is expensive, inflexible, non-participative, and unsustainable.
2. The inhabitant is no active participant in the process of designing and building the framework for his/her house as well as his/her home.
3. The traditional house is a supplied “product” that is not adequate to address, to incorporate, or synthesize with the increasingly hybrid built environment.

If we address the various accompanying reasons for both arguments above, we could include, primarily from a social point of view, that by large:

- we fail to provide proper housing to changing households, i.e., many more households have/will become one person for various reasons as well as the increasing demand to live together in more or less multi-family households;
- we fail to provide proper housing for refugees, the homeless, and/or otherwise people who have the (legal⁵) right to a roof over their head;
- we fail to provide proper housing for elderly people who are committed/forced to remain in their house since other options/locations of care-taking have disappeared;
- we fail to address the anomalies of “the market,” causing unjustified variations in housing prices or rents within one street;
- we fail to facilitate larger scale creative and/or innovative projects in which the citizen or inhabitant prevails, despite the urge to do so since decades and the proof that this is feasible;
- we fail to create a level-playing field for those individuals and/or groups that search for alternative options in housing;

⁵<https://www.un.org/en/universal-declaration-human-rights/index.html>

- we fail to adapt/modify regulations for building housing where it concerns more innovative and/or personalized typologies.

Summarized: we fail to synchronize our lived space – i.e., our house and our home – with the climate, social, and technological (digital) developments that have an undeniable, inescapable, and continuous influence on our lives, our identity, our experience, and, therefore, on all consequences involved. Where architecture is the conditioning of the environment for human inhabitation, we cannot disregard the developments that influence that same inescapable environment, now as well as in the future. I repeat, we do not have even an educated guess what the world will look like in 25 years while, at the same time, we act rather pretentious by envisioning and realizing what our housing should look like in 125 years. Taking into account that the average period people inhabit their house and that most developments occur within a timeframe of 10 years, we give in to the necessity to build flexible, adaptable, and sustainable. We need to acknowledge that not all can/should be planned, organized, and realized; we need to ensure an amount of freedom; freedom to adapt to changing circumstances and shifting households, in brief, to a society in continuous change. This runs parallel with the urging issue of organizing and, above all, protecting our online and offline identity as participating citizens as well as the accompanying personal data involved.

Much like, e.g., the actual climate discussion, adapting and/or changing the entire process of providing the basics of our housing requires awareness, imagination, but, above all, the ambition, desire, and persuasion to change; not for the change itself but because it answers current questions and developments as well as addressing social and environmental questions. Since my working years in architectural offices, during my own work and research over the years as well as participating in a wide variety of debates and discussions on different platforms, I am well aware of the arguments – usually distributed by the building chain – for *not* having to contemplate or consider change and for *not* adapting or transforming traditional habitual processes. In particular, where it concerns housing the traditional – rather stubborn – view is that designing and building housing does not, should not, or cannot include the inhabitant. It is at large limited to business as usual, known practice and to keeping procedures and product as they are instead of envisioning contemporary and future housing in an increasingly hybrid world. However, we do not build for the sake of building only, we build in a world that is in a constant mode of change, and the actual as well as future consequences of these changes now require a serious shift. The entire building chain, i.e., municipalities, project developers, architects, and builders, has the shared responsibility to recognize this, acknowledging

the fact that a changing world implies a changing attitude, response, and, above all, a changed “product.” Or, in the words of architect [Ben van Berkel](#): *“One of the tasks is to design buildings so that they can operate in an energy-neutral way. But not as it is now. With all the machines it contains, the current buildings are a kind of dead body. The designs of the future should be much more organic, optimally circular, energy neutral, fully digitized, but above all much more social and focused on people. Another important task is that we make the buildings optimally flexible and can be re-arranged to be able to respond to changing needs of users or residents. A kind of architecture on demand that remains during the life of the building. That will be the point in the future.”*⁶

Let me illustrate this problematic situation using a somewhat literally “outer-space” parallel example: imagine for a moment that in the near future, a large group of men and women has once again set down on the moon, by now with the clear goal of staying there for several years. First important consequence is that some kind of adequate shelter has to be erected or constructed to create and provide the premises for a habitat. Is it realistic to believe that they will start by laying a concrete foundation, pile bricks, mount window-frames, and add roof tiles? Most probably not; long before this journey started, an innovative technological system will be envisioned, developed, and prepared based on time, space, and place, on circumstances and requirements, on technological (im)possibilities, as well as adequate methods and processes of logistics, construction, and maintenance. We will have fundamentally rethought ahead the whole paradigm of providing shelter, i.e., adequate living space.

The current process of building our housing (as illustrated in Chapter 6) is primarily structured around fixed entities, at the end of which the inhabitant is the one lacking all real participation. This is all the more curious as well as undesirable, given the fact that while a house is a most vital and prominent element in life – it is to become our lived space, i.e., our home – it is at the same time the element on which one has the least influence. Assuming we grant the (“smart”) citizen the much necessary agency, we should extent this agency to the – shaping of – built environment as well. There is no “smart city” without a “smart” inhabitant, meaning that citizens occupy a “connected” environment while staying in control over the data gathered by actions, movements, and decisions made within their private space.

⁶<https://www.architectuur.nl/interview/ben-van-berkel-circulair-bouwen-innig-omarmen/>

Form and shape

Due to social changes, technological innovations, and industrial developments, the need to accommodate inhabitants as well as trying to ensure future markets, we sometimes encounter interesting examples of other forms of – in fact traditional – housing, sometimes initiated by project developers and/or building companies. An actual development is “tiny housing,” i.e., small houses with a floor plan of 25–50 m², preferably located in the periphery of cities in rural or natural areas. Provided reasoning for this is the perfectly reasonable question whether it is necessary to have more m², argued by the supposed lack of need for persons, objects, and space. While it is obvious that everyone should decide for him/herself what amount of space and objects is required, it is also obvious that the “romantics” of this way of housing is in its minimized size/scale and its location, preferably (as stand-alone) in the natural/rural environment. Understandably, many of us will prefer to live in or near nature; at the same time, this can hardly be achieved while scaling up, i.e., for the larger numbers in need for a “housing for the millions.” It is, in that sense, an almost privileged and maybe even somewhat elitist escape.

An accompanying principle is pre-fabricated (tiny or semi-permanent flex), houses that can be transported to another location should, e.g., changing jobs or social reasons, require removal. This assumes that municipalities have the option of simply relocating a complete house and supplying the needed foundations and adequate infrastructure. Although for many the ultimate goal is to be “off-grid”, i.e. independent of local infrastructures, the question remains if this is a realistic option for the larger scale. Together with the requirements for building houses that are technologically suitable for removal, the costs of transport and relocating one can question once again whether this is a realistic solution for larger numbers. Also, we should be aware that what at first was supposed to be an often, temporary solution ends up becoming permanent solutions. The most adamant reason for removal has its origin in the qualities/characteristics of the house, not primarily other factors such as work or family (see Chapter 6). It seems therefore not very logical to relocate the same house elsewhere, if even achievable in the first place (ill. note: e.g., the – once nomadic – [Dolgan](https://www.encyclopedia.com/history/modern-europe/russian-soviet-and-cis-history/dolgan)-people of Siberia used portable housing that was moved “in full” elsewhere on a sledge when the seasons shifted; even they have now moved to more or less fixed settlements⁷).

⁷<https://www.encyclopedia.com/history/modern-europe/russian-soviet-and-cis-history/dolgan>

Another small-scale development is the realization of co-housing, i.e., a group of houses, often within one larger unit accompanied by common spaces for a selected amount of like-minded people that have decided to act and live together. An early example is the “Centraal Wonen” project in Hilversum, built in 1977, largely based on previous projects in, e.g., Denmark. While many of these projects have a history of organizational discussions as well as an extensive period of realization and problems concerning rules and regulations, it remains a random group of various people with the rightful intention to share some services/facilities but keep their individual preferences. Since this will be a repeating issue – the composition of the group will change over time, and people change their mind and move or pass away – the question is valid whether this is an adequate answer for the larger scale/numbers, as long as it is to be realized for a specific group of people only. The need/desire for living together in some cooperative construction is of course worthwhile researching and realizing; nevertheless, it will always need incorporation within some larger scale/entity. An interesting actual and well-thought example of a socially creative initiative is, e.g., the Rotterdam’s “[Woongenootschap](#),” as argued in their statement: we wish to create a variety of housing within one project, facilitating various family compositions in close combination with common areas. By operating without a profit motive they claim to guarantee the preconditions for quality, affordability and sustainability.

In a recent article in a Dutch financial newspaper, the lack of owner’s participation in providing/building houses is questioned: it is a clear plea for self-building by individual inhabitants, not via project developers and/or municipalities. It argues: “self-building is essential in a self-reliant society” (transl.mp). This is in itself a justifiable argument, were it not that our housing will always be part of some community with needs and wishes for adequate infrastructure and common services. Another argument used is the fact that owners of houses build up capital (in periods of economic growth), given that – for now – the value of their house tends to increase over time; tenants do not profit in this way. It raises the question why it is necessary in the first place to own a house instead of using one; the same issue is increasingly raised over many other topics/objects such as, e.g., cars or tools.

Once again, the limited number of privileged inhabitants building their own individual housing does not answer for the urgency to build for the larger numbers, and it does not address flexibility and/or the future adaptability; it causes therefore ultimately more waste as well as shortage in specific types of housing. It answers an individual need for creating and building one’s own specific house without questioning its environment and the – personal or other – needs in a near or further future. At the same time, the current discussions too often become blurred by the (traditional) argument – false or else – that many desire

an individual house with a garden and a carport. What should not be forgotten is that for decades the ownership of a house is often given priority over renting a house, also encouraged/stimulated (financially) by various governments. Given many other actual developments e.g. expected changes in household typologies, we should rethink this and probably accept that for a number of reasons this is not realistic; if only for the danger that individual housing often causes individualized neighborhoods since we all “own/rent” our property and have our own garden instead of common grounds. Many examples over various countries show that a shared responsibility for the (built) environment develops shared interest, often resulting in a more committed community in which all inhabitants participate.

Industrialization and standardization

Creating a split between support and infill provides ample industrial options to (pre)fabricate standardized/modular systems to separate spaces. An interesting industrially innovative building development – since 2011 – comes from the UK: [Wikihouse](#). It consists of an industrialized system of open design and prefabricated elements of which characters, measures, and technology are available as open-source data, to be downloaded and provided to a manufacturing plant with an adequate computer numerical control (CNC) machine. Unlike the tiny house principle, however, it originates in situations where there is enough space – read urban options – to add an individual house to other plans. The system requires a certain amount of “freedom” to deliver its advantages; it is not (yet), however, focused on a larger scale as part of a wider (urban or architectural) environment. Its undeniable benefit and quality, however, is its open-source principle, its standardization, modularity, options for reuse, and, therefore, circularity and sustainability. It is therefore promising that this “system” is now part of EC/Interreg – Housing 4.0⁸, a project for “near-zero energy homes.” Also, companies like the US-based [Katerra](#) or [Blokable](#) as well as the Dutch company van Wijnen strive for a far more industrialized building system that prefabricates complete houses or elements such as walls and roofs and transports these to the site and assembles. This is, in fact, an updated/modernized version of the 1960s Dutch LELY-system in which complete one-storage housing was prefabricated in sections, transported to the site on a trailer, assembled, clad, and completed with a roof.

⁸<https://www.nweurope.eu/projects/project-search/h40e-housing-40-energy/>

What, however, binds the above (with the exception of Wikihouse) is that almost all have their origin again primarily in *process*-innovation, not in *product*-innovation. Ultimately, it is the building/manufacturing company that profits while – if standardized, planned and utilized properly – it should be the inhabitant that profits, be it the first or the last. As Habraken and CIB⁹ illustrate, starting back in 1960s up till today, there is a number of reasonable and realistic “ideas” that do justice to the much needed important participative role inhabitants should have in creating their built environment, whether they are the owners or tenant. The primary important question is to what extent its framework can/should be common and its “infill” remains personal and individualized. Next, what innovative technological means are and will be available, now and as a result of broad developments in 5 or 10 years. If we distinguish an entire building in a permanent main structure and a flexible further infill, we can also acknowledge that the former demands other qualities/specifications than the latter; i.e., where the “outer” shell requires sustainable barriers against the elements, the “inner” infill can be more flexible, leaving more room for adaptation.

As early as around 1950, [Yona Friedman](#) concluded that “*architecture must learn from its inhabitants; the inhabitants are always right.*” He added three preconditions for a “people’s architecture”:

- it must make use of inexpensive elements;
- it must be easy to assemble, at a do-it-yourself level;
- it must be easy to disassemble and reassemble.

Later, in 1967, John Habraken declared¹⁰ that architecture always knew three aspects:

- the particular building first desires a completed concept;
- it concerned a single piece of work, in the sense that details and construction were determined for each project individually;
- there is the aspect of time; building is the braving of time.

(transl.mp)

⁹<http://open-building.org/about/objectives.html>

¹⁰Habraken, N. J. (1967). *het Alledaagse, over het ontstaan van de omgeving van alle dag*. Lemniscaat.

Note the similarities and consequences between the above and van Berkel's statement referred to above; all address the flexibility and the role of the inhabitant over time. Where it concerns issues of sustainability; it is also encouraging that – at last – the overall call for building with wood as a full constructive material instead of the CO₂-consuming process of using concrete (the production of cement is responsible for 8% of all CO₂ emission¹¹) and steel is made. Recently, architects Andrew Waugh in England and the Dutch Bjarne Mastenbroek and Marco Vermeulen made a clear plea¹² for a paradigm shift: building with wood is far more eco-friendly (i.e., it encloses CO₂, is more sustainable, and provides a better inner atmosphere). Both point to the traditional “system” as a cause for not applying/utilizing wood as a standard material: in the Netherlands, we are used to the building in concrete and bricks since, historically, we are located near rivers and use its clay. Compare this with, e.g., Scandinavian countries where wood is all around, resulting in a widespread use for building housing. The claim often heard is that there simply are not enough trees to supply the necessary wood: however, e.g., in the EU, the “Bonn Challenge 2011” to replant 150 million of acres deforested/degraded lands, as well a renewal of forests of 350 million acres worldwide by 2030 meets broad agreement. On top of this comes the EC's Green Deal – plant 2 billion trees in Europe. What is needed is a real shift in thinking first: it is therefore promising that various housing projects on a larger scale in wood are now planned/realized: e.g., the “SAWA” project in Rotterdam by MEI-Architects, the “HAUT” project by Team-V and the “Poppies” project by MKA, both in Amsterdam.

Concept and system

As said before, our environment rapidly becomes a synthesis of digital and analog, of the physical and non-physical, and of the real and the virtual. Environment as well as object becomes digitally addressable, meaning that a new layer of connectivity – and thus the exchange of data – occurs. This exchange is vital for a connected city and its inhabitants since we need to behave and act as involved and above all participating citizens. The framework for these interactions will, for decades, remain a primarily physical one, nevertheless, again in Ben van Berkel's words “*A kind of architecture on demand that remains during the life of the building.*” It is this amalgam of spheres that, above all, requires that we rethink our identity within the *infosphere* and the ways/means to protect this; after all, so far, we have little or no control over

¹¹<https://www.carbonbrief.org/qa-why-cement-emissions-matter-for-climate-change>

¹²<https://www.vpro.nl/programmas/tegenlicht/kijk/afleveringen/2019-2020/houtbouwers.html>

the data we produce and, in fact, own. Currently, research is conducted over what constitutes our identity, our relation to objects, as well as the need to maintain that relation when unwanted or unneeded. Initiatives like [Solids](#) and an EC project like [DECODE](#) are “a response to people’s concerns over losing control of personal information on the internet.”

Together with the increasing Internet of Things/People we proceed in a direction in which it will become increasingly complicated – see the Onlife Initiative (OI), Chapter 10 – to distinguish what constitutes cause and effect; i.e., man’s influence needs to be redefined and renegotiated. At the same time, we should be aware that, as poetically put in, e.g., “the Data Prevention Manifesto”: “*We need to materially engage with the enigmatic, the flawed, the partial, the impure, the surprise, the transgressive, the Black Swan.*”¹³

Synchrony

Trying to summarize the above and incorporate/translate it into a system, the actual definition of both built environment, digital (infra)structure and data, could be described as a cyber–physical system (CPS). In the definition of CPSE: “CPS’s are systems that link the physical world (e.g., through sensors or actuators) with the virtual world of information processing. They are composed from diverse constituent parts that collaborate together to create some global behaviour. These constituents will include software systems, communications technology, and sensors/actuators that interact with the real world, often including embedded technologies.”¹⁴ Other definitions include more precisely the “human component” ([NIST](#)) and/or vary on details; their overall character however includes both human as well as non-human elements in an attempt to synchronize, ultimately to be able to perform adequate action.

Returning to the OI, we see the parallel: the concept as we know it – i.e., together with an originally natural sphere and an additional artificial/physical built environment that, by now, facilitates an increasing digitalized infrastructure – can be rethought as a more or less intelligent “system of systems”: the amalgam of all that surrounds us and influences, determines, and frames our (built) environment in which we are

¹³<https://dataprevention.net>

¹⁴<http://www.cpse-labs.eu/cps.php>

enmeshed but remain active players, not sub-ordinates of technology. As Kas Oosterhuis argues: “We must see all objects, including the ‘I’ and individual building components, as actors, as active players in a parametric world.”¹⁵

Research

With the above in mind, let us take a closer look at some actual international (research) initiatives and projects focusing on architecture (i.e., the built environment) and often its periphery on some research that has by now ended and, on some, still active.

- The [EC-Levels](#)¹⁶ project focuses on improving sustainability of buildings and environmental performance. It is/was a (in time) limited project by means of a reporting framework and has closed its first period; it will report back in Spring/Summer 2020.
- The [EC-LIAR](#)¹⁷ project searches to “transform our habitats from inert spaces to programmable sites,” using complementary technologies that can influence our built environment.
- At various universities, e.g., MIT-Cambridge (see, e.g., the work of [Neri Oxman](#)), IAAC-Barcelona, TU-Delft, etc., specific research programs study the options for a more creative and participative role: at TU-Delft Department of Architecture, its [Hyperbody Lab](#) searches for “interactivity in the process of collaborative design, also in the use and maintenance.” Recently, the Universities of Newcastle and Northumberland/UK launched a research hub¹⁸ where “Its aim is to create a new generation of ‘Living Buildings’, which are responsive to the natural environment, grown using living engineered materials, which process their own waste, reduce pollution, generate energy and support a biological environment that benefits health.”
- Other research institutions focus on, e.g., “Assisted Living”; see, e.g., the iHome-Lab at ETH in Zurich while Smart Homes Eindhoven’s emphasis is “home-automation & smart living.”

¹⁵Oosterhuis, K. (2011). *Towards a New Kind of Building*. NAI Publishers.

¹⁶<https://ec.europa.eu/environment/eussd/buildings.htm>

¹⁷<http://www.fetfx.eu/project/liar/>

¹⁸<http://newsroom.northumbria.ac.uk/pressreleases/world-first-research-hub-to-create-living-buildings-2889657>

- In particular, over the last years, we see an increasing development of innovative materials¹⁹ that interact with external sources or adapt/modify due to changing sound, light, or temperature. These materials are not only designed and utilized within architecture but also increasingly in objects that – given their purpose – become (active) part of that architecture. For example, consider artists like [Antony Gormley](#) who researches the positions and relations of the body within architecture (see “Horizontal Field” – 2012, or “Blind Light” – 2007), or media-artist [Refik Anadol](#) who “*explore(s) the space among digital and physical entities by creating a hybrid relationship between architecture and media arts with machine intelligence*” or architects [Philip Beesley](#) and [Daan Roosegaarde](#) who integrate material properties with art and urban/architectonic environments, fashion designers [Pauline van Dongen](#) and [Iris van Herpen](#) who fuse technology with traditional craftsmanship, or sound-engineers/artists like [Martyn Ware](#) who intertwines sound with spatial frameworks; all constitute their respective – future – links between the arts and the (built) environment.
- Finally, the options for bodily “connectivity” will only increase; we see a wide variety of, e.g., sensorial options to explore, sense, and participate within a hybrid environment, part of which remains physical. See, e.g., the work of [Stelarc](#) – “the body as a sensible concept” or artist [Viktoria Modesta](#) who is “a bionic artist exploring modern identity through performance, technology and science.” Again, sensorial options “in (wo)man” are closely linked to a responsive environment, providing/causing interaction and enhancement while diffusing our traditional role/position as a “consumer” of space.

Various other initiatives focus to rethink the realization of our built environment from a parallel perspective, often structured upon the increasing possibilities that digital (design) developments can facilitate. For example, Open Source Architecture (OSArc) initiated in 2011 by [Carlo Ratti](#) or the Berlin-based [hybridspacelab](#) which is an “interdisciplinary platform for innovation contributing to positive societal and environmental change” while incorporating digital technologies from all relevant and peripheral disciplines.

Summarized: due to innovative and creative technological research and development where it concerns physical frameworks/backgrounds as well as the continuous synthesis of the digital and analog and the real and the virtual, the traditional former strict boundaries of what constitutes our (built) environment change. It implies that our attitude, our behavior, and our actions will change accordingly since we are accustomed

¹⁹<https://materialdistrict.com>

to an environment that is traditionally inert. Back to Luciano Floridi: we now live in an “infosphere,” we can no longer disconnect, assuming one (c)laims to be an active participant of society in change.

So far, the virtual will exist *within* the physical; but its position and role will more and more become part of our experience since it can be integrated in the environment. Paul Virilio, though not the most optimistic one when it concerns technology, once predicted “*Something will affect the building in its very persistence, the resistance of its materials, the duration of its immediate efficiency. It will become less than a decor - a form-image as unreliable as a mirage*”²⁰. Still, a building will – for the coming first decades – remain a primarily physical entity, existing within a sphere that rapidly becomes a mix of traditional and new but also of more or less vague granular notions of connectivity and agency. The challenge will be to “build or construct” with a human-centric approach without neglecting its connectivity and flexibility, as Peter Sloterdijk once stated “*Those homes are the best in the market, combining all privacy benefits with all access options*”²¹. This is, in fact, a rather traditional point-of-leave, assuming he refers to a home as an entity that is built. Remember the OI: its first subtitle was “Concept-Reengineering Exercise” and its initial setup was the rethinking of public spaces in the digital transition, at the same time, acknowledging that a fifth topic should be added to the existing four; i.e., the blurring of the distinction between public space and private space (see Chapter 5). However, the “home” that does the “combining” has yet to be built certainly on a larger scale; it is in this scale where the most promising options are hidden. The “promising” is enclosed in the next and final chapter: “Epilogue.”

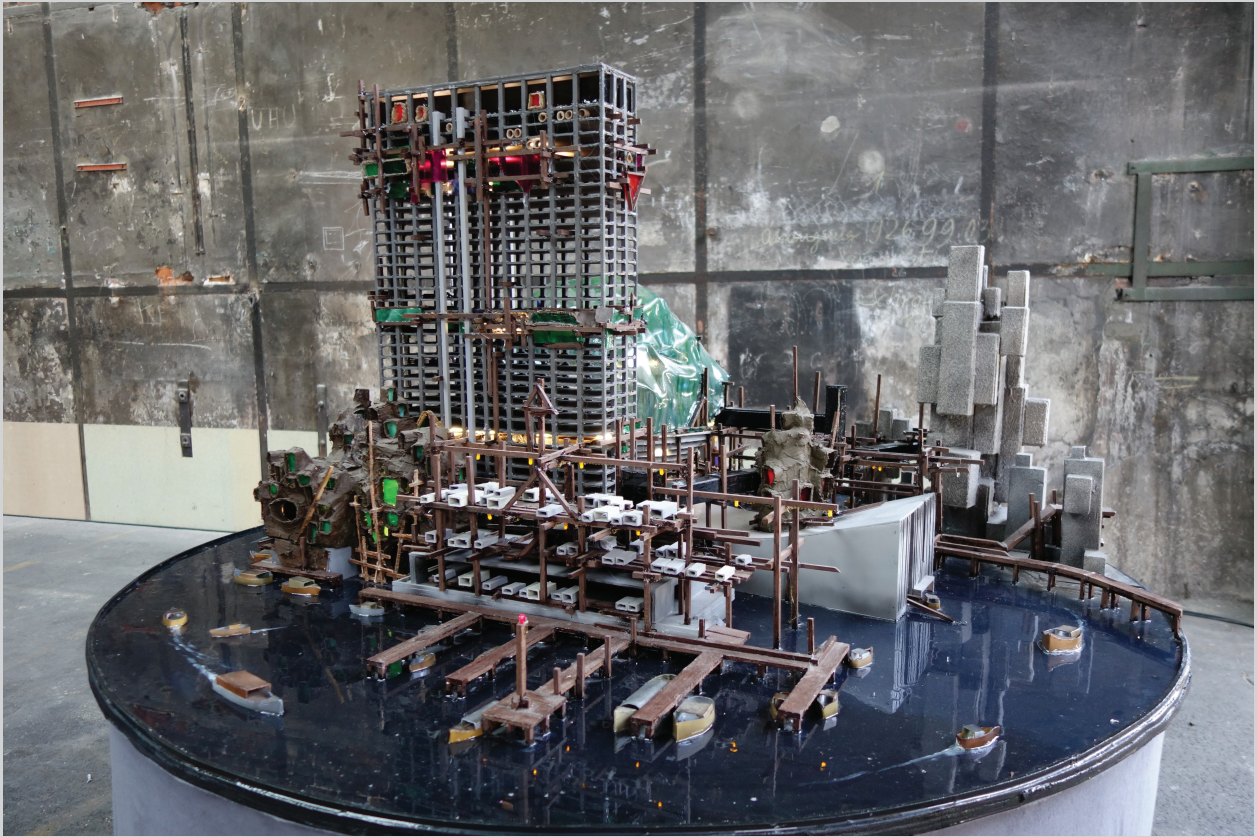
²⁰Virilio, P. (2012). Lost Dimension. Semiotexte.

²¹Sloterdijk, P. (2009). Sferen II / Schuim. Boom Onderwijs.(p.391)

“In order to address life as lived, a life always and already possessed of sensorimotor skills afforded by the body and structured by cultures, architecture must create appropriate transformative atmospheres accommodating habit as well as bringing about productive (poetical and ethical) change.”

“Is it possible for cultural survival to be content with a soulless environment good enough to house the needy or the affluent, to expect nothing more than the production of merely functional, physically sustainable, and at times fashionable building?”

Alberto Pérez-Gómez, ‘Attunement’



“Rob Voerman, 40°44'58"N 73°58'5"W, 2018/2019, 190 × 190 × 230cm, steel, wood, cardboard, epoxy, led-lighting, glass and archival glue.

The work shows a transformed UN-Headquarters. The political infrastructure has been placed outside and on the ruins of Niemeyers design, including a fragmented stadium which becomes a new general assembly/forum. The structure has become a peninsula in a flooded area. The work questions existing democratic structures and representation and points toward possible future constellations.”

14

Epilogue

“We need the ‘networked individual’ to change; from an identity spontaneously produced by technology and social freedom to an identity consciously crafted by collective action”¹.

Paul Mason

“At its most elementary, architecture does little other than design and construct frames; these are its basic forms of expression”².

Elizabeth Grosz

Spring, 2030

From a distance, the five- to seven-storey wooden buildings seem to fade between their surrounding environment and the clear skies above the river, given the fact that it is structured in and around the lush, green newly planted areas in the western part of Rotterdam. These former ports, terminals, warehouses, and industrial areas, after being neglected for decades have been redeveloped into attractive sections of the city that – to a large extent – are self-organized and self-supporting. In part raised from ground

¹Mason, P. (2019). Clear Bright Future, a radical defence of the human being. Allen Lane. (p.193)

²Grosz, E. (2008). Chaos, Territory, Art. Columbia University Press. (p.13)

level where urban farming is located, all other levels are structured around common areas that serve as entries to the various houses and small working areas as well as service areas for domestic and logistic purposes. The spacious common terraces in between serve as places to meet and relax; structured around nature-based areas covered with trees, shrubs, and rotating greenhouses. The entire project, initiated 10 years before by a collaboration of the City of Rotterdam, two architects, and two housing corporations, also serves as, in part, research- and, in part, test-bed project. The City provided and prepared the grounds and designed and managed the infrastructure, the corporations acted as organizing and managing entity between the architects, and builders and the organization to assist assisted inhabitants. More important, the project functions as a pilot to investigate its climate, control, and privacy settings; inhabitants are in control of their personal data connected to time and place. Their agency guarantees a participating role within the local government, in discussions, and common decisions that concern their immediate sphere, e.g., waste management, and local urban issues such as energy, services, traffic, and transport.

An automatic electric shuttle brings me as far as the pedestrian area and the central entrance of the building; an elevator takes me up to the first level with its housing areas, all situated at the edges of the supporting structure. Each level incorporates two-storey houses, all modifiable at its façades between completely open to completely closed off. A digital floor plan mentions the individual inhabitants; on the screen, I select the persons I need to visit and await the reaction in the shadow, provided by the overhanging vegetation.



It is – even with the inescapable imagination – no longer a classic radio play. When I approach the green oak paneled door, it unlocks, guided by software that has recognized me from an earlier visit. Before me stands an old man and close behind him an old woman, both with a confident and joyful look on their face. A few minutes later, we sit together at a small wooden table with coffee and chocolate biscuits; I remember the last time I was here. I recall the domestic items and the smells of times long gone. But what has changed is the atmosphere or, rephrased, the imagination and presence of that sphere. One entire inner wall is “covered” by an image of their former neighborhood and house, an image very slowly shifting from the left to the right, showing the narrow street and the canal with its old trees. No nostalgia here, just an adequate yet illustrative reminder of previous other times elsewhere, times with their specific quality and personal memories.

The couple has been informed a few months earlier that their request for an extension of their place is considered and approved by the community. They desired and needed more space to be able to accommodate their grandchildren when necessary, but this implies a change within the overall plan of common and private areas. When they started inhabiting this building, they also agreed to share part of their spaces with their fellow inhabitants in this section, so there is now the possibility to rearrange their premises within the common main structure. There is no need for them to move elsewhere; the common spatial structure in this section houses around 120 people, i.e., families, singles like students, and elderly. Structured along the standardized principles of industrial elements and their infrastructure, it is only a matter of hours to adapt the infill, connect the services needed, and rearrange the privacy settings. All building- and infill-elements are tagged and registered; each one is reused. Their contract will also be adapted since the total surface of their occupied space has increased; the standard contribution for each m² is defined, as are the fees for various advice and the hours needed for adaptation. Their privacy settings require a minor adaption since their outer spatial separation is increased; the grid that covers the entire floor and building calculates their use and the software adjusts the settings for various infrastructures, to be monitored by them.



To end

I am fully aware of the possibility, most likely the probable fact, that these texts will cause the much aimed discussion, raise questions, and produce critique: “this all has been argued before,” with minor success. However, anyone consulting the various media – be it from a general, technological, and/or architectural background – will recognize the increasing number of (research) articles and opinions that question or even criticize the current situation of designing, providing, and building our housing. But to get somewhere together, we first have to decide *not* to remain where we are now. Rephrased: the process of envisioning, realizing, and occupying our housing can/will only change when, collectively, we make the choice to change. I am also aware of the fact that for about 50 years now, many people within the housing building industry will acknowledge that things have to change, as I have illustrated in the previous chapters and pages. This however can only become a reality when the entire chain of participants is aware of the

current and future situation, when the inhabitant is included in the complete process and will have a lasting influence in what determines and shapes his/her environment. First, it may seem a step back for many currently involved; but it also provides a step forward, i.e., ample chances and opportunities for those same parties, assuming we stop treating the envisioning and realization of our housing as some distant logistic process that excludes the inhabitant. As citizens, we have acquired more and more ways and means to become – in part – independent of these traditional and sometimes obsolete processes; we also possess the technical/digital options to exercise our power and have a real influence in what concerns our life, all assuming we have/gain authority and control over the data/information we produce and utilize.

Recalling the illustrative words of Constant when he talked about his “New Babylon, sketch for a culture”: *“The climatic conditions (..) are all under technical control. Inside, variable range of climates can be created and modified at will. Climate becomes an important element in the play of ambience, all the more so since the technical apparatus is accessible to everybody and the decentralisation (of distribution) encourages a certain autonomy of the sector or groups of sectors. (..) The fluctuating world of sectors calls on facilities (a transmitting and receiving network) that are both decentralised and public. Given the participation of a large number of people in the transmission and reception of images and sounds, perfected telecommunications become an important factor in ludic social behaviour”*³.

At [Council](#), the unavoidable shift from an Internet of Things to an Internet of People is emphasized for years now; the “infosphere” is inclusive of objects *and* humans. It is within this context that architecture – and therefore our housing – is situated and thus cannot be excluded; it is not autonomous. If we value our dwelling – which we can hardly negotiate – we need to value our position, place, and agency in a hybrid world. In the adequate words of Mireille Hildebrandt in the Onlife Initiative (OI): *“(..) we need an environment to construct an infrastructure that allows for a plurality of publics, a choice of exposure and places to hide”*⁴.

Preferably, “everything at once.”



³Constant; ‘New Babylon, schets voor een kultuur.’ 1974. (orig.German)

⁴Floridi, L. et al. (2013). *the Onlife Initiative*. (p.176)

An additional, but in my view necessary and inescapable actual, note:

When I started writing these texts in early 2019, no one could have anticipated the actual situation caused by the development and rapid worldwide spreading of a contagious virus – four proteins and a piece of genetic code – that has changed our world in a most fundamental way and thus emphasized once again the urgent need to rethink much of what we have taken for granted far too long. Now, we have no educated guess how long this disruptive situation will continue, nor do we have a clear image of the world in one year’s time from now. But as Jeff Malpas argues: *“dwelling (..) does not name one mode of being as opposed to another; it is the essential way human being is in the world”*^a. Now that dwelling, our “being in the world,” has, to a large extent, become dependent of often alienating circumstances beyond our control, it raises the question as to the extent in which we should be in full control. Where previous social/architectural projects often originated from – in Situationist’s terms – a sense of play or “*derive*” we may well be forced to change the physical translation of our dwelling into something more personal, temporary, and technological: a state-of-the-art environment or shelter as ultimate answer to changing circumstances.

As illustrated in Chapter 4 – “Early and recent history” – a wide variety of artists, architects, and parallel disciplines have tried to envision/design a world according to the developments (or the lack thereof) occurring in their times; some unrealizable due to social circumstances or technological requirements unavailable at that time. Much of what is written in previous chapters should have illustrated that much of what has been argued in particularly the last 50 years is far from new; we have failed though to act accordingly and envision/create systemic change instead of cosmetic appearance. Many around the world acknowledge that the unsustainable, linear ways in which we inhabit and exploit our planet, together with our consumerism, travels and other ways of transport cannot be maintained. Political, economic, as well as social circumstances have caused environments in which “to dwell” has often become an anachronism where it should be a vital element to experience life, in lived space.

We believe – too often – that we are in control of the world around us; many believe we can capture society and life by clean numbers and detailed statistics, and many believe that providing a manual equals adequate use. We fail to allow the uncertainty and the unexpected, while many expect

^aMalpas, J. (2012). Rethinking Dwelling: Heidegger and the question of place (p. 12).

and believe – even urge – that we need to return to the times before the virus, to the questionable economics on which many of us thought we could build a sustainable and inclusive society for everyone. At the same time, we discuss digital control systems that via technology “promise” a world in which this will not happen again and, if so, we can control this as well. Today, a world-spread virus has confronted us with too often disruptive circumstances we did not anticipate, although it is us that created or facilitated the preconditions. It has locked us into a place we know as protected space, without – for a long time – the assurance that we could venture safely into public space where we are subject to threats unfamiliar and unknown to us. This seems therefore all the more remarkable when we remember earlier innovative projects, e.g., Michael Webb’s “Cushicle,” Francois Dallegret’s “Un-house,” Haus-Rucker-Co’s “Oase nr.7,” or Toyo Ito’s “PAO” (see Chapter 4), that tried to think/design individual systems of shelter; systems that separate and/or isolate man from his/her environment by offering (mobile) protection and a mode of personalized privacy. Looking at many of today’s protective outfits, the step further is the one that creates a dichotomy between basic shelter and built environment, ensuring freedom of movement, protection from elements, and control over shelter. If man is to become more like a nomad, due to environmental changes, the limited availability of work and/or other causes, why should his refuge, his *pied-à-terre*, be a permanent one?

In 1963 Constant Nieuwenhuys gave a lecture on his 'New Babylon' project at the ICA in London. As Mark Wigley writes he "concluded by insisting that the images that would follow were just props for the imagination of a future world that by definition could not yet be visualized. But the audience was still encouraged to literally enter the atmosphere of the images as if entering a 'new and unknown city':

"After this basic information, I will show you a number of slides that show details of the models I made to illustrate my conception. I hope they will help you get an idea in which way an unfunctional city for not-working people may differ from the kind of cities that are built until now for working people. With these slides I only want to give you a suggestion like the painter or the poet used to suggest a world different from the utilitarian world he tried to escape from. I certainly don't want to predict how the world of the future will look like in any detail, for that would be impossible. I just will look like when labor will be abolished. So I beg you to look on these slides as if you were visiting a new and unknown city and to undergo its specific atmosphere. A sound-tape that I will let you hear in the same time, is meant to suggest the presence of life, and the rest is left to your own imagination"

Mark Wigley, 'the Hyper-Architecture of Desire'. (p.58)

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Marwan Rechmaoui (1964, Beirut, Lebanon) studied sculpture and painting between 1987 and 1993. In his work Rechmaoui derives inspiration from the geography and complex multi-cultural history of Beirut, reflecting on themes of urbanization and contemporary social and behavioral demographics. In lieu of mapping urban spaces, the artist does not view the city according to typical urban planning standards, instead he points to socio-political affiliations and etymological histories from each community. (Source: Booklet exhibition 'Marwan Rechmaoui: *Slanted Squares*, Bonnefanten.)

Rob van Kranenburg (1964) is interested in what is called the digital transition from a perspective of decision mechanisms and structures. He is the founder of IoT-day (iotday.org) and the Internet of Things Council. (theinternetofthings.eu)

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About the Author



Martin Pot is researcher/interior-architect/writer/thinker. After Technical School Rotterdam he finished the WdKA – Academy of Arts in Rotterdam on Spatial Design; after a sidestep in digital cartography he completed the Hora Est-program at Erasmus University Rotterdam as preparation for a PhD on the subject of architecture, technology and dwelling. He has initiated and organized the six IoT & Built Environment conferences, later MeetUp's from 2011 to 2017 in Rotterdam. He writes regularly for various media about (interior)architecture, human values and technology

Home in a Hybrid World or to dwell in a networked environment

Martin Pot

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Prof. Elizabeth Sikiaridi and Prof. Frans Vogelaar, Hybrid Space Lab, Germany

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