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The Use of the Unused Space

Florian Wurfbaum

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Royal College of Art for the degree of Master of Philosophy**

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Florian Wurfbaum,

September 2014

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TABLE OF CONTENT

Abstract	9
Introductory Remarks	11
1 Introduction	15
2 Context: Architecture	21
3 Context: Society, Culture and Technology	35
4 Patterns of Use, User Identification, Control	49
5 Elastic Architecture	63
6 Case Studies: Tracks and Curtain	105
7 Conclusion	179
List of Illustrations	185
Glossary	189
Bibliography	194
Appendix	207

THE USE OF THE UNUSED SPACE

Abstract

At one moment one person can only be present at one place. Starting from this observation I develop a hybrid building for complementing programmes, that distributes space in real-time, reacting to the presence of its users at different times. This implies flexibility of the building components in a system of spatial distribution.

Using design as a research tool, I carry out design experiments which are informed by rules and parameters corresponding to patterns of use. The design research is embedded in the current social and cultural context of the sharing economy where smart mobile technologies enable the distribution of goods. Here, the distributable good is the temporarily unused space in a building.

INTRODUCTORY REMARKS - MOTIVATION

The seeds of this research are contained in the project Zufall ('Jack of all Trays', 1997) where I first tested expandable architecture. Based on this project, I built a small prototype (inflatable structure) in 2004¹ - at Number 2 in the Hörwarthstraße in Munich. Later this building became the project Tridom Puzzle, by *WUDA, where I developed the double-helix principle in the Chambord-inspired stairs. This was my first built exploration of the concept of entanglement. A constant in the work of our practice is 'Verschränkte Plastik'. In English this can be translated as 'Entangled Eidicity'. This is the principle I followed when designing the Chambord-stairs in Tridom Puzzle to entangle two apartments. Apartment means that we live apart from each other, however together in the same system. Through this spatial entanglement, a social relationship is translated into a tectonic form. This allows circulation space in each flat to be saved, meaning each neighbour profits from the other. In Tridom Puzzle the entanglement means a 'sharing' of infrastructures, however keeping the division, the threshold between spatial entities - apartments. The geometry (double helix) allows the necessary separation of spaces with different ownerships. This has led me to further speculate on systems that while allowing a separation of spaces can still imply a sense of 'sharing'. More recently I have explored this in our practice in the project Entangled House - Complementing Building (Munich, 2014). Here the main element is a system of staircases which allows an entanglement of spaces.

These projects have allowed a deeper tectonic and sociological reflection on the topic of sharing and infrastructure. This has been a complement to developing the current research.

¹ with FAN - Friendly Architects from your Neighbourhood, a platform I co-founded with Ulli Bucher, Achim Kammerer and Frank Philipp.

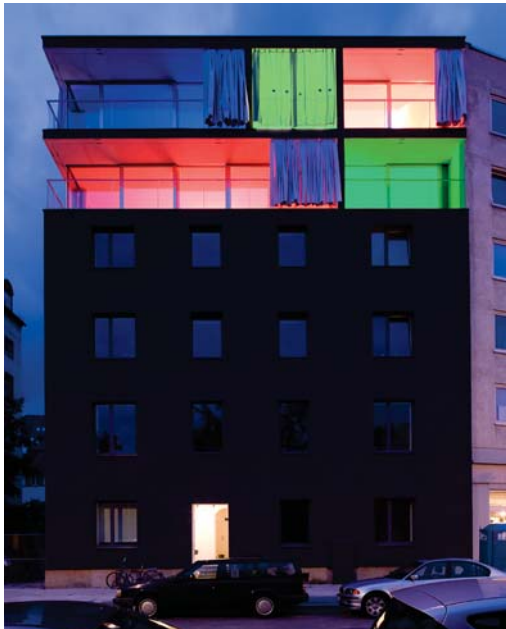
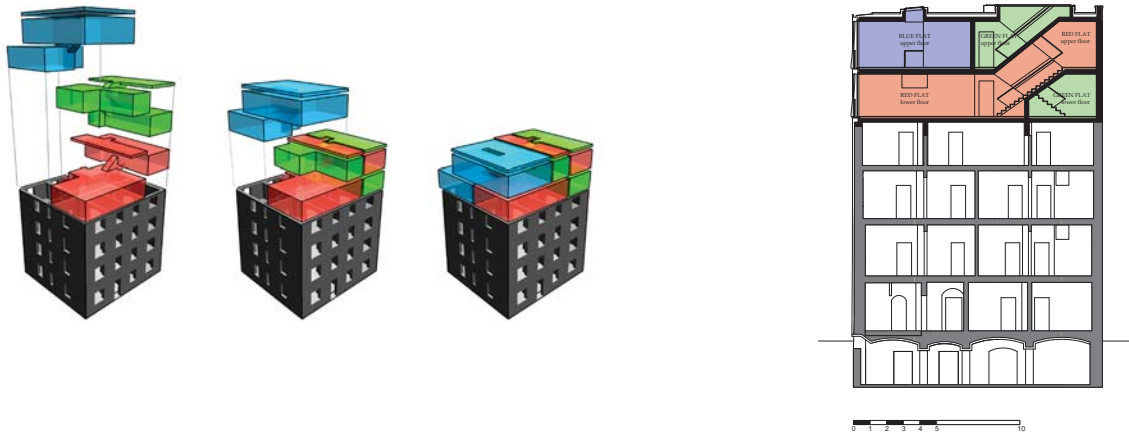


Fig.1
Tridom, Extension of a residential building, Munich 2009

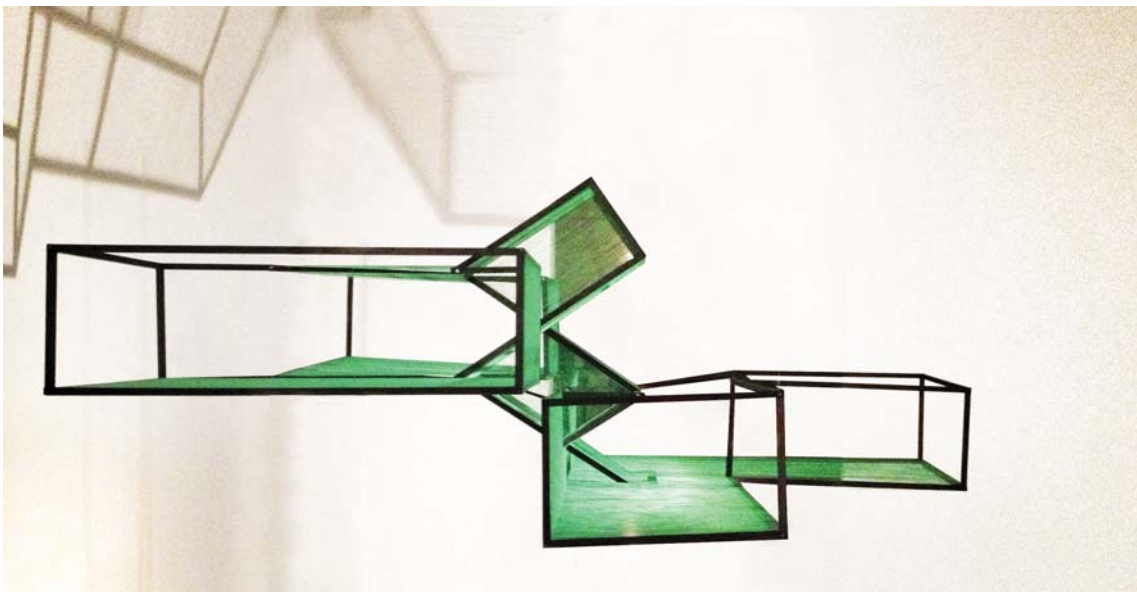
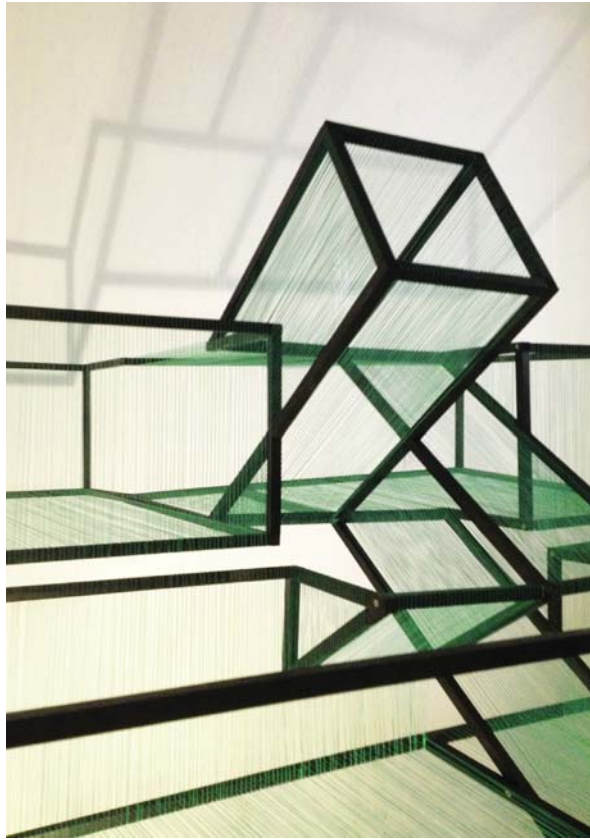
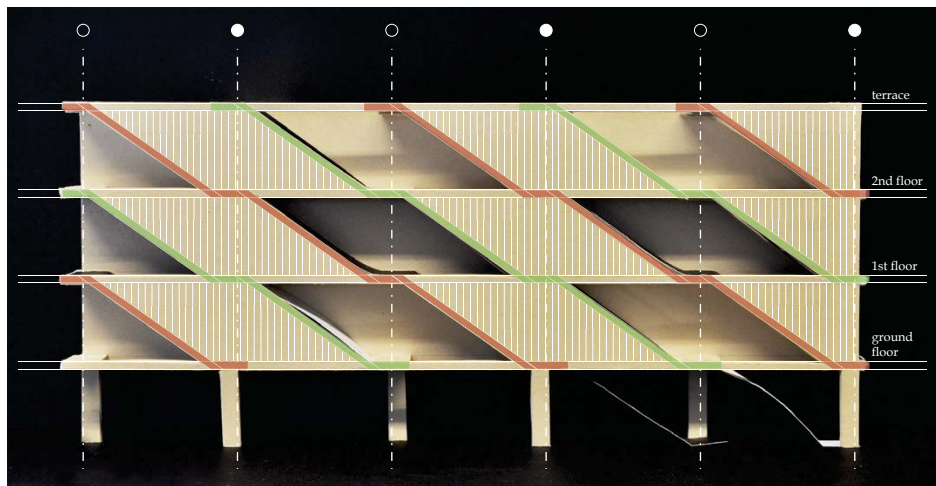
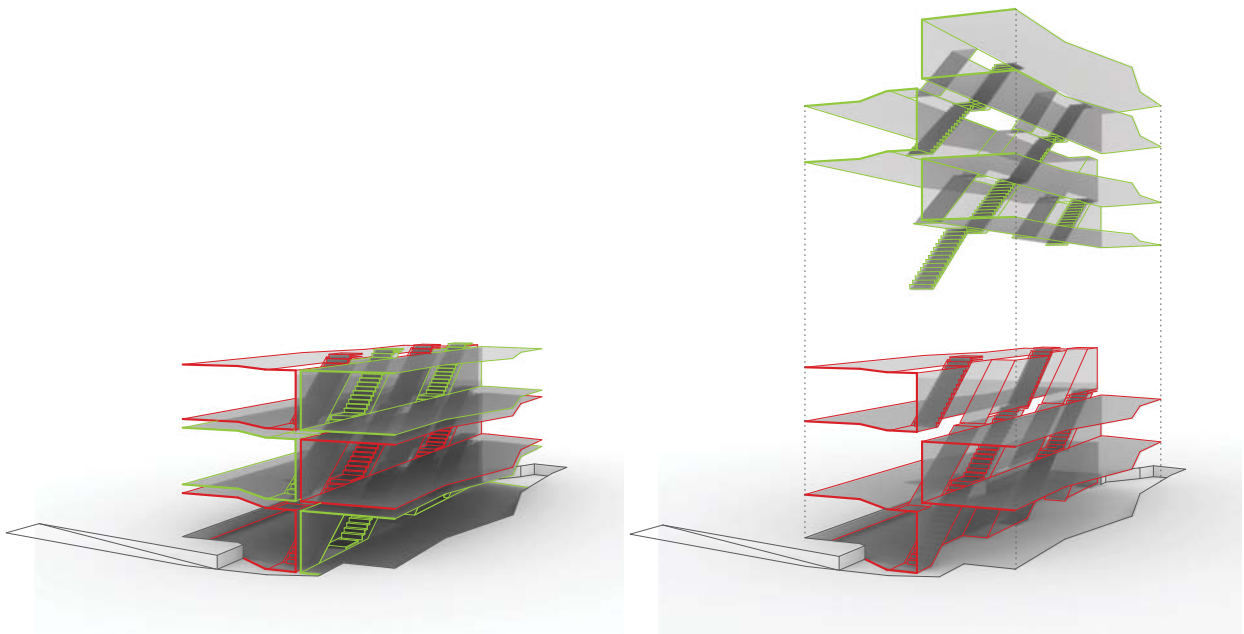


Fig.2
Entangled Eidicity, Installation, Förderpreis Exhibition, Munich 2013



— Stairs house A
— Stairs house B

Fig.3
 Entangled House, Complementing building, Munich 2014, Project

As for my own opinion, I have said more than once, that I hold space to be something merely relative, as time is; that I hold it to be an order of coexistences, as time is an order of successions. For space denotes, in terms of possibility, an order of things which exist at the same time, considered as existing together; without enquiring into their manner of existing. And when many things are seen together, one perceives that order of things among themselves.¹

1 INTRODUCTION

1.1 OBSERVATION

1.2 INTENTION

1.3 RESEARCH QUESTION

1.4 EXPECTED OUTCOME

1.5 METHODOLOGY

1.6 TIMELINESS

¹Leibniz, Gottfried Wilhelm. *A Collection of Papers, Which passed between the late Learned Mr. Leibnitz, and Dr Clarke, In the Years 1715 and 1716*. London: Samuel Clarke, 1717. Print.

1.1 OBSERVATION

This research starts with two observations: at one moment one person can only be present in one place. And: many buildings serve a single programme only. Building programmes, often, use only a fraction of the time of the day and of the week. For instance many office buildings are only used on weekdays during working hours. At night and at weekends these office buildings are unused.

In order to understand the potential that underlies these observations, I would like to ask the reader to think about the situation and space where she or he is at this very moment. And then, to think about all the other spaces that are being held available for her/him and for her/his possessions at the same time. One can presume that the amount of individually held available space is more than the one where she/he is present at the moment: the space at home, in the office, university, the room in the parents' house, the holiday home, the car, all possibly unused.

1.2 INTENTION

I regard unused space as a valuable resource.

In this research project I intend to develop a building that can take advantage of this resource, negotiating supply and demand. Unused space could be used by programmes that complement existing programmes at other use times.

The aspired building deals with an overlap of different programmes within defined spatial boundaries, at different times. It benefits from synergetic effects by joining programmes with complementary time needs.

Together with the spatial proposal, a concept for the fourth dimension of the project - time - will be developed, in a reactive system of distribution of

space. There are tendencies in current society that demonstrate openness to alternative solutions to conventional services, mainly the currently booming sharing economy. These are enabled mainly by sophisticated distribution and operational systems, using smart mobile devices in an environment of ubiquitous computing and real-time geo-positioning.

I aim to use these technical possibilities to develop a real-time negotiation of space between multiple users and time-complementing activities in the same building.

The benefits of such ('two in one') buildings are an efficient use of land and a more intense use of their capacity. Infrastructure, means of access (including parking), the conditioned (heated or cooled) space are all used twice whereas in typical single-use buildings these components lie dormant for long periods of time.

The intended original contribution to knowledge is primarily in technical innovation: A system of distribution of space. There are social and political aspects of this project that will not be addressed in depth, since they are outside the scope of this study.

1.3 RESEARCH QUESTION

How can a distribution system of space between temporal complementary programmes within a building be designed and operated, reacting to presence and absence of multiple users?

Sub-questions

Are there architectural projects with similar aims, how are they categorised and how could they inform this research? (Context: Architecture)

Are there similar projects, products, schemes of distribution of expendable goods and how are they operated? How could they inform this research?
(Context: Society, Culture and Technology)

Who could be the users of a building with temporal complementing programmes? **(Patterns of Use, User Identification, Control)**

In a speculative approach (neglecting building material properties), which spatial 3-dimensional models can be explored in order to support the idea of a fast reacting flexible architecture that is capable of containing at least two spatially discrete programmes, with indirect proportionally oscillating degrees of utilisation, and of assigning spatial volume according to the degree of utilisation, benefiting from 3-dimensional expanding and shrinking properties? Would these models deliver advantages above conventional flexible architectural configurations? **(Elastic Architecture)**

Is it possible to complement an existing building programme in an existing site with a second programme that takes advantage of the unused space contained in temporal gaps? **(Case Studies: Tracks and Curtain)**

How can space within a building be negotiated space and timedynamically?
(Case Studies: Tracks and Curtain)

1.4 EXPECTED OUTCOME

Design and evaluation of a spatial distribution system for complementing programmes that reacts to users' presence and absence, conveyed through text, diagrams, drawings, models, scripts and calculations.

1.5 METHODOLOGY

The methodology will be explained throughout the different chapters when specific methodologies were used at different moments.

First stage:

- Analysis of predecessors, identification of categories of flexibility, generation of a catalogue of characteristics of flexible architectures **(Context: Architecture)**
- Study of patterns of use in mono-occupational buildings **(Patterns of Use, User Identification, Control)**
- Study of the predictability of spatial use through surveys and interviews **(Patterns of Use and User Identification, Control)**
- Fieldwork study: Analysis of an administration building in Munich **(Case Studies: Tracks and Curtain)**

Second Stage:

- A series of studies of spatially elastic geometries **(Elastic Architecture)**
- Analysis of an existing building in the city of Munich **(Case Studies: Tracks and Curtain)**
- Architectural project through scripting and drawings **(Case Studies: Tracks and Curtain)**
- Two design proposals exploring different thresholds, and geometric configurations in an existing building in Munich into a dual use building **(Case Studies: Tracks and Curtain)**
- Development of two control mechanisms inherent in the two above approaches **(Case Studies: Tracks and Curtain)**

1.6 TIMELINESS

Smart mobile devices and ubiquitous computing, are key components of my research. These provide a new approach to control, not only top-down but also bottom-up and across different entities. The adjective 'smart' has been used over the last decades to describe objects, devices, systems, networks, embedded with technology, and containing a potential intelligence to react to other objects, devices, systems, networks. This is now timely in almost every field. The Smart City is one example of it, and it consists of the use of existing resources and their connections in an urban context. Also the 'internet of things', an emergent topic, relates to the exchange of data between things (non-human exchange between objects, devices, systems, networks) negotiating supply and demand like in the topic of smart energy management and Smart Grid.

What I am proposing could qualify as 'smart space management' in a dynamic real-time process.

- 2 **CONTEXT: ARCHITECTURE**
- 2.1 INTRODUCTION HISTORY
- 2.2 ADAPTION IN NOMADIC SOCIETIES
- 2.3 THREE CATEGORIES OF FLEXIBILITY BY ADRIAN FORTY
- 2.4 BIOLOGY AS REFERENCE: GROWING STRUCTURES /
METABOLISM / ADAPTIVE SYSTEMS
- 2.5 NEGROPONTE SOFT AND CYCLIC, EVOLUTIONARY
ARCHITECTURE, CYBERNETICS AND THE FIRST
INTELLIGENT DIGITAL BUILDING
- 2.6 SELF-ORGANISING AND SELF-ASSEMBLING SYSTEMS
- 2.7 CONCLUSION

2.1 INTRODUCTION HISTORY

Adaptive, alterable, convertible, cyclic, elastic, evolutionary, flexible, interactive, reactive, mutating, responsive, reconfigurable, soft, versatile. All these are frequently used adjectives to describe spatial structures and architecture and their (per)mutation in time (short term) or over time (longer term).

This chapter will give an overview of the different categories of changeable spatial structures in architecture.

Throughout history, any given spatial structure has always undergone changes in terms of physical alteration or change of use. Flexible and adaptable architectural structures existed long before the twentieth century, when the term flexibility started to become an important modernist term¹. Because of the physical endurance of buildings - which were often built to last no less than forever² -, and out of practicability reasons, alterations are made to existing structures in order to fit them to changing demands (e.g. the Victorian House). This is done in order to avoid demolition and the erection of new buildings.

The motive behind flexible and adaptable architecture seems to be very simple and the same throughout history: archaic and basic functions, such as the provision of a roof and shelter are regarded as too profitable, too expensive and too precious to be replaced, even if the use of the actual spatial structure, the building changes.

For this motive societies and architects, as well as users, have developed designs and strategies to make the most effective use of given space. On the following pages I will introduce the most relevant categories of architecture spaces that change.

¹ Adrian Forty, *Words and Buildings : A Vocabulary of Modern Architecture* (London ; New York: Thames & Hudson, 2000), p. 142.

² For instance, the Italian official system to evaluate real estate is based on a mathematical formula which assumes that a property will indefinitely be able to generate a steady annual income.

The goal of this chapter is to provide a targeted literature review on the topic of flexibility.

2.2 ADAPTION IN NOMADIC SOCIETIES

To contextualize flexibility I start with ancient examples. Kronenburg states that architecture, right from the beginnings of the simple hut, the central Asian yurts and the tents of the North African Bedouin culture has always had an inherent component of flexibility³. Dwelling and dwellers form a unit that reacts to its habitat.

2.3 THREE CATEGORIES OF FLEXIBILITY BY ADRIAN FORTY

The Nomad's architectural behaviour could be placed into Adrian Forty's category of flexibility by technical means, as it is mainly enabled by the tent as a technical device.

In his book *Words and Buildings* Forty identifies three distinct strategies of flexibility in architecture: redundancy, flexibility by technical means and flexibility as a political strategy⁴ (as found in Henry Lefebvre's *The Production of Space* (1974)⁵).

The category of redundancy identifies spatial excess, often found in pre- or non-functional buildings, like 'baroque palaces, where rooms were not dedicated to specific uses'⁶ as a source of flexibility. Flexible buildings of this category are still being built today; they are luxurious structures beyond demand. (Large multi-purpose structures such as covered markets can belong to this category of flexibility by redundancy or can join the category

³ Robert Kronenburg, *Flexible: Architecture That Responds to Change* (London: Laurence King, 2007), p. 11.

⁴ Forty, p. 143ff.

⁵ Forty, p. 148.

⁶ Forty, p. 144.

of political flexibility. This has to be seen case by case.) Following this argument, the smaller and more constraining a space is, the more difficult it is to be kept flexible. In the case of lack of redundancy, the technical category becomes important, also for permanent structures: Le Corbusier's *Maison Loucheur*⁷ or the *Maison du Peuple* by Beaudouin, Lods, Bodiansky and Prouve⁸ are examples where architecture followed the trend towards effective systems as politically enforced by the introduction of ideas like the 'Existenzminimum'. Here, physical changes to spatial configurations provide flexibility and multiple functionality.

Often flexibility by technical means is paired with what Forty calls flexibility as a political strategy. This is the case for instance at Cedric Price's *Inter Action Centre*. Price not only incorporated technical features like cranes and portakabins but also supported the flexibility of use. He labelled the project 'Amalgam'⁹, indicating the multiple use appropriation and also highlighting the importance of 'the delight of the unknown'¹⁰.

To describe the category flexibility of use or as political strategy Forty quotes Henry Lefebvre who sees it enabled 'through the user's realisation of the space's flexibility and multifunctionality'¹¹. A good example for this category is the *Cathedral-Mosque of Córdoba*, built in 600 by Christians and appropriated and re-appropriated both by Christians and Muslims. Here 'flexibility is not a property of a building but of spaces'¹².

I conclude that a multiplicity of spaces can qualify as flexible, and there are projects whose categorization is ambiguous, like the project *No-Stop City*, by *Archizoom Associati* in 1970.

⁷ Kenneth Frampton, 'The City of Dialectic', *AD Architectural Design*, 1969, 541-546 (p. 544).

⁸ Charlotte Ellis, 'Prouve's People Palace', *AR Architectural Review*, 1985, 40-47.

⁹ Cedric Price, 'Kentish Town West Amalgam, London', *AR Architectural Review*, 1973, 19.

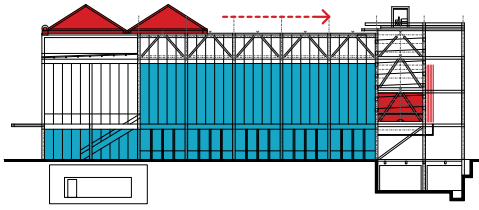
¹⁰ Cedric Price, *Cedric Price: the Square Book*. (Chichester, West Sussex: Wiley-Academy, 2003), p. 54.

¹¹ Forty, p. 148.

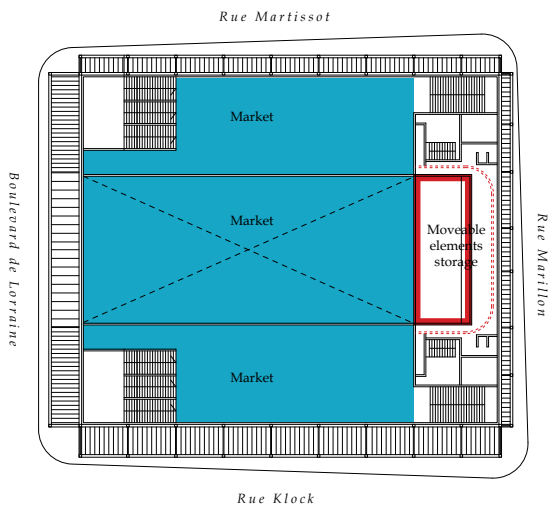
¹² Forty, p. 148.

DAY TIME USE
Market

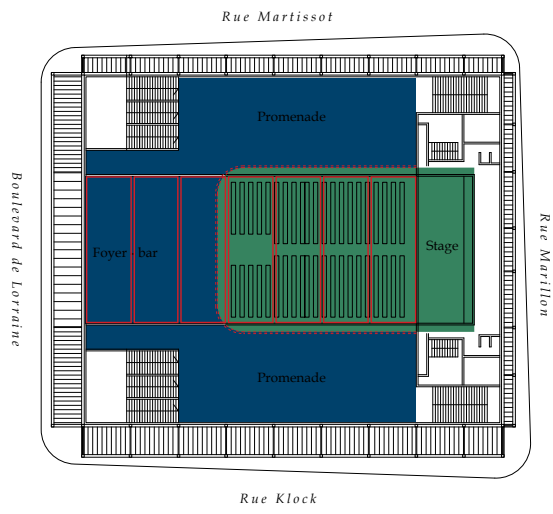
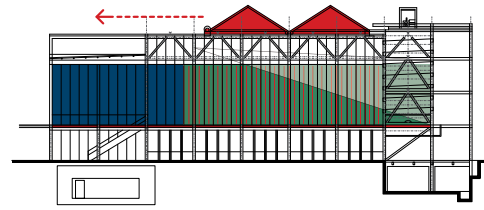
Section



First floor plan



EVENING USE
Cinema, Theatre, Convention



Isometric views

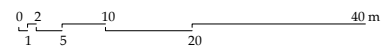
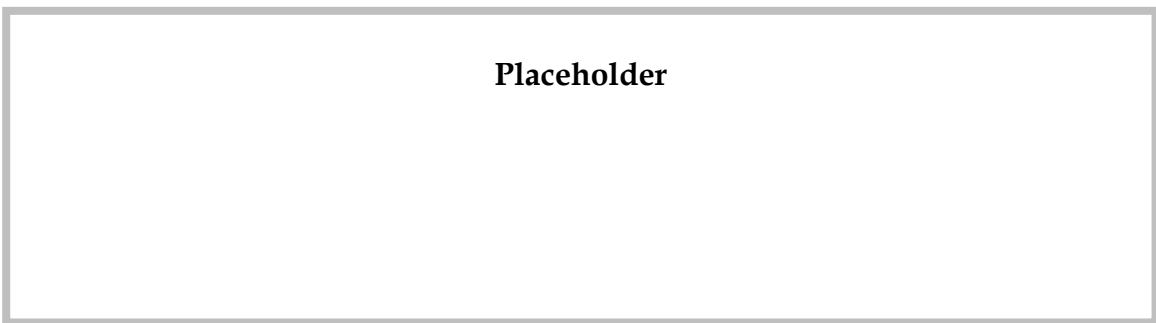


Fig.4
Maison du Peuple à Clichy, Paris, France, J. Prouvé et E. Beaudouin, M. Lods, V. Bodiansky, 1939:
moveable parts are drawn in red

I carried out an analysis of specific projects in order to extract the important points of the different degrees of flexibility. This was important, in a first phase, to inform the design research (see Appendix). Of these three categories I am interested in exploring flexibility by technical means to develop change in the tectonic properties of a building. In my research this flexibility should support an expansion and shrinkage of spaces, through the movement of thresholds.

2.4 BIOLOGY AS REFERENCE: GROWING STRUCTURES / METABOLISM / ADAPTIVE SYSTEMS

In 1931, Martin Wagner advocated the process of building as organic growth. His 'Growing House'¹³, embedded in a 'Growing Neighborhood' opposed the concept of 'Existenzminimum' and was situated in a rural or suburban context.

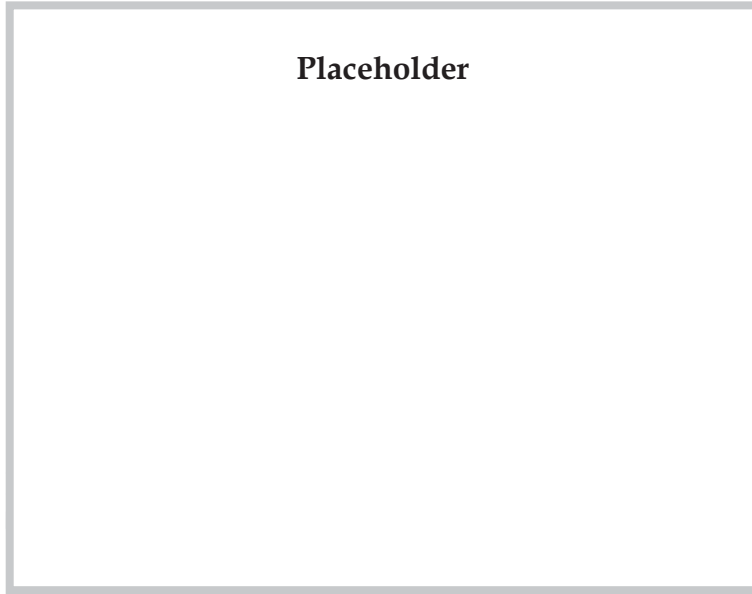
In 1960 the Metabolists' movement had a more urban approach, when they declared 'Metabolism - A proposal for a New Urbanism'. The biological metaphor was used to express their perception of society as a vivid process. They declared change as a result of human verdicts and proposed the design of space on the basis of metabolistic cycles, where only the parts of a building would be replaced or changed over a cycle, that are not of use any more¹⁴. In his Sky House (1958), Kiyonori Kikutake provided a structure for his own family dwelling with enough indetermination to easily adapt over the years to the process of the life of his family¹⁵. Kisho Kurokawa's Nagakin Capsule Tower (1972) consists primarily of an infrastructural tower where inhabitable and exchangeable cell-style capsules were plugged in. In his

¹³ Joaquin Medina Warmburg, 'Hausanbau - Wachstum Als Moderne Wohnutopie', *ARCH+, Zeitschrift Für Architektur Und Städtebau*, IBA Hamburg - Haus Der Zukunft, 198/199 (2010), 122-127 (p. 122).

¹⁴ Architektenkammer Nordrhein-Westfalen. and Manfred Speidel, *Japanische Architektur : Geschichte Und Gegenwart* (Düsseldorf ;Stuttgart: Akademie der Architektenkammer Nordrhein-Westfalen ;G. Hatje, 1983), p. 96.

¹⁵ Architektenkammer Nordrhein-Westfalen. and Speidel, p. 94.

Section, exemplary



Plans, exemplary

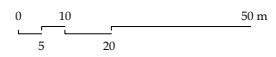
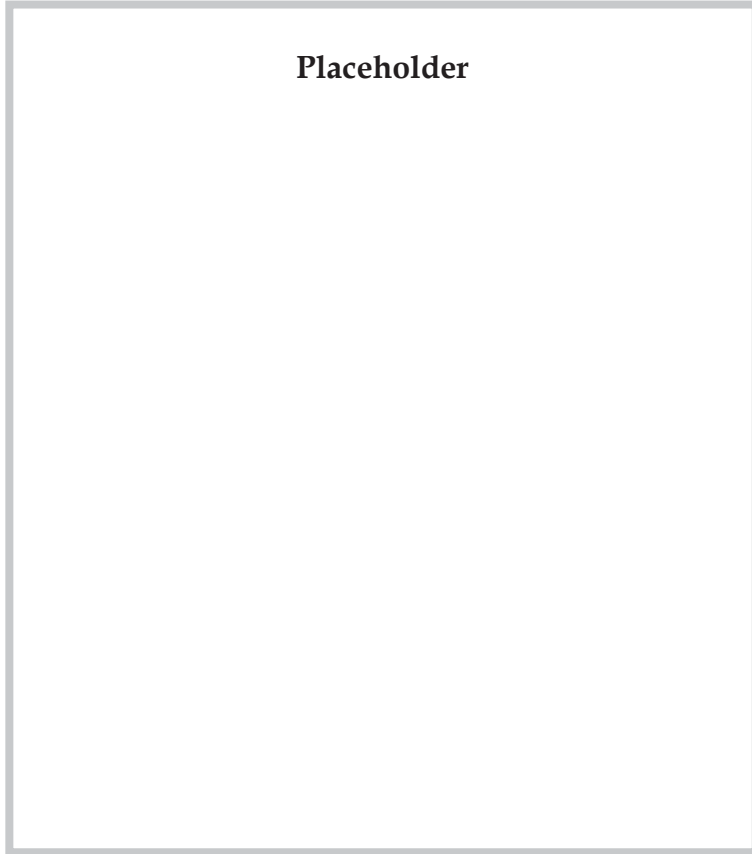


Fig.5
No-Stop City, Archizoom Associati, 1970

Capsule-declaration¹⁶ Kurokawa describes how architecture progressively takes over the character of equipment. The capsule substantiates the emancipation of a built structure from the plot.

I also intend to provide the possibility of change over time, in a more reduced time frame: real-time.

In Europe, SAR (Stichting Architecten Research) under the leadership of John Habraken developed a structural system that allowed for an anarchic image of growth and decay¹⁷. It was realized in 1969-77 by architect Lucien Kroll for the students' campus of the Saint-Lambrechts-Woluwe University close to Brussels. The structurally hierarchical system of support and infill allowed for a participatory approach, involving the inhabiting people in the design.

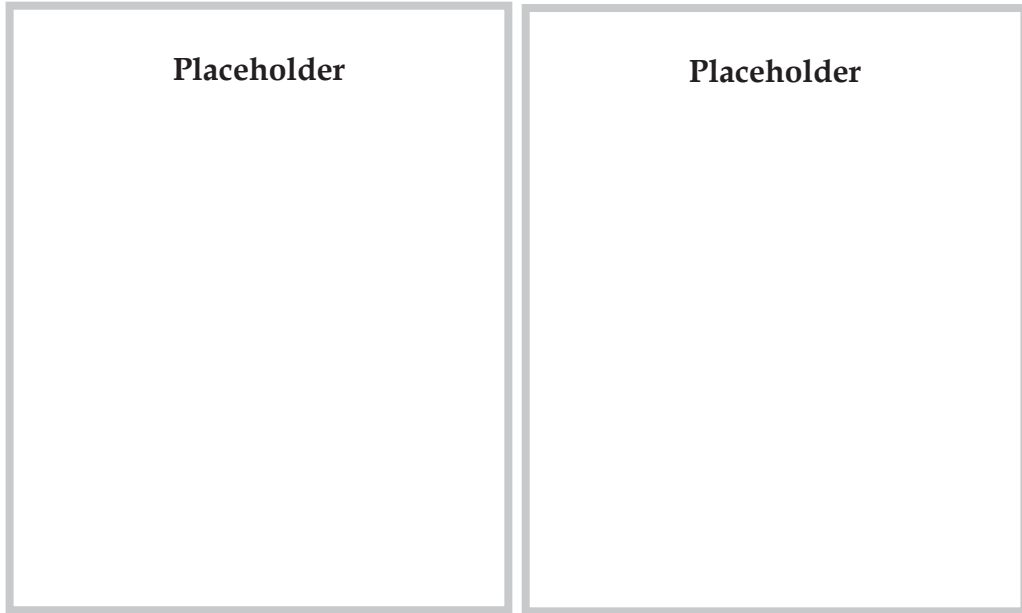
I also intend to use participation, but in terms of reacting to presence. If present or absent, the user triggers changes in the overall system.

¹⁶ Kishō Kurokawa, *Metabolism in Architecture* (London: Studio Vista, 1977), pp. 75-86.

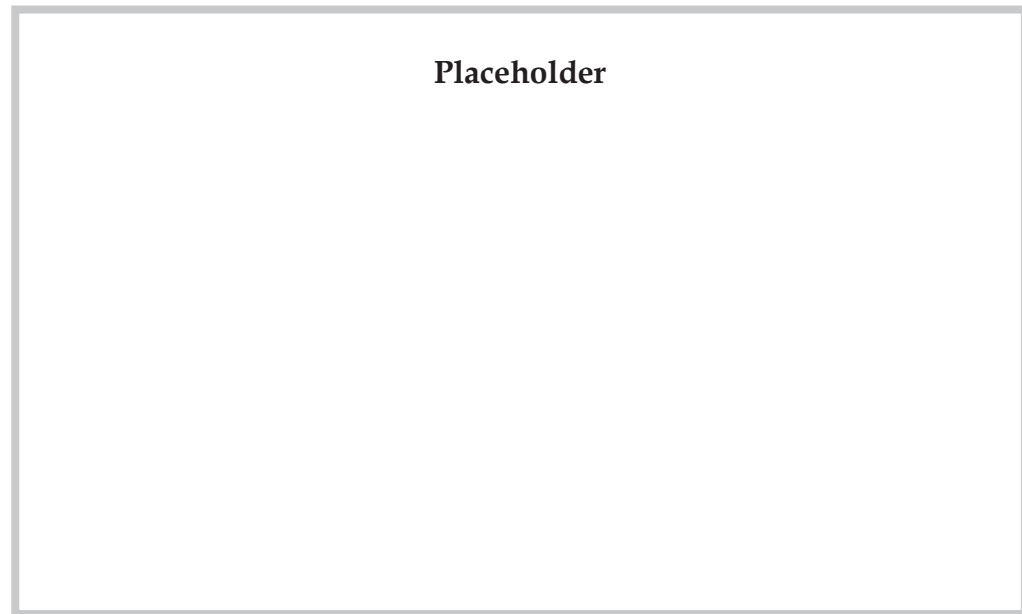
¹⁷ Warmburg, 122-127 (p. 126).

Elevation

View from the city



Plan



each unit could be individually replaced
allowing for a bottom up approach to
the provided infrastructure

0 2 10 m
1 4 scale 1:200

Fig.6
Nagakin Capsule Tower, Tokyo, Japan, K. Kurokawa, 1971: moveable parts are drawn in red

2.5 NEGROPONTE SOFT AND CYCLIC, EVOLUTIONARY ARCHITECTURE, CYBERNETICS AND THE FIRST INTELLIGENT DIGITAL BUILDING

Like the Metabolists and the Structuralists (like Team X), Nicholas Negroponte also picks up the term *cyclic*, using it in his book *Soft Architecture Machines* to describe one characteristic of responsive architecture as 'continuous cycle of construction and deconstruction that architecture has to perform over its lifetime' and that should 'be included in the architecture's design'¹⁸. Moshe Safdie describes his fantasy:

[u]ltimately, I would like to design a magic housing machine... Conceive of a huge pipe behind which is a reservoir of magic plastic. A range of air-pressure nozzles around the opening controls this material as it is forced through the edges of the pipe. By varying the pressure at each nozzle one could theoretically extrude any conceivable shape, complex free forms, and mathematically non-defined forms. People could go and push the button to design their own dwelling (1970)¹⁹

Negroponte categorizes *cyclic* as an ever continuous building process. But his other category, *soft*, adds a new component to changing architecture: intelligence. He assigns the property of intelligence to material, giving material memory. Though he illustrates his texts with pneumatic architectures, he doesn't limit a material memory to these structures. Even hard components can contain *soft* information.

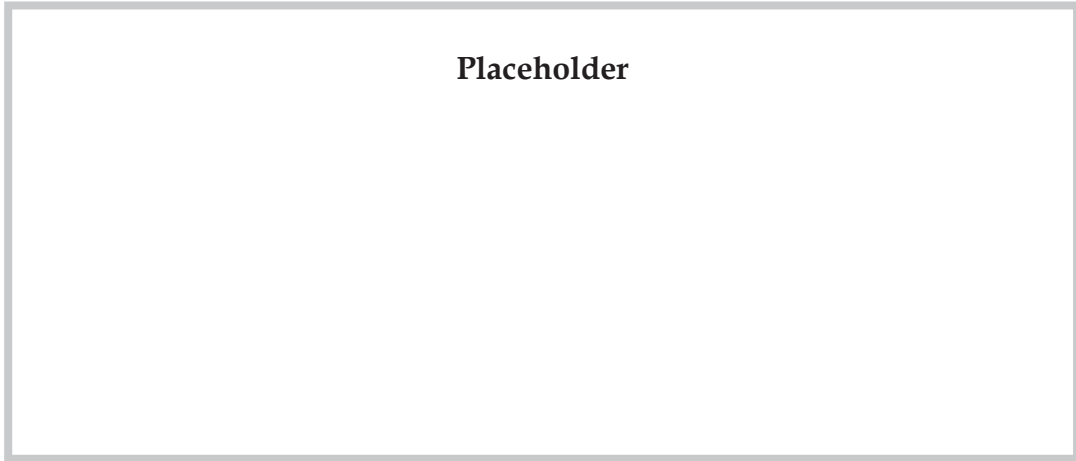
A few years later, this idea was about to be realized in an architectural project: Cedric Price's Generator (1976-79) is 'an architectural complex with no previous title and no predefined use, only with the desired end-effect of the creation of desirable conditions and opportunities'²⁰. For the project for

¹⁸ Omar Khan, 'AD Protocell Architecture: An Architectural Chemistry', 2011, p. 51.

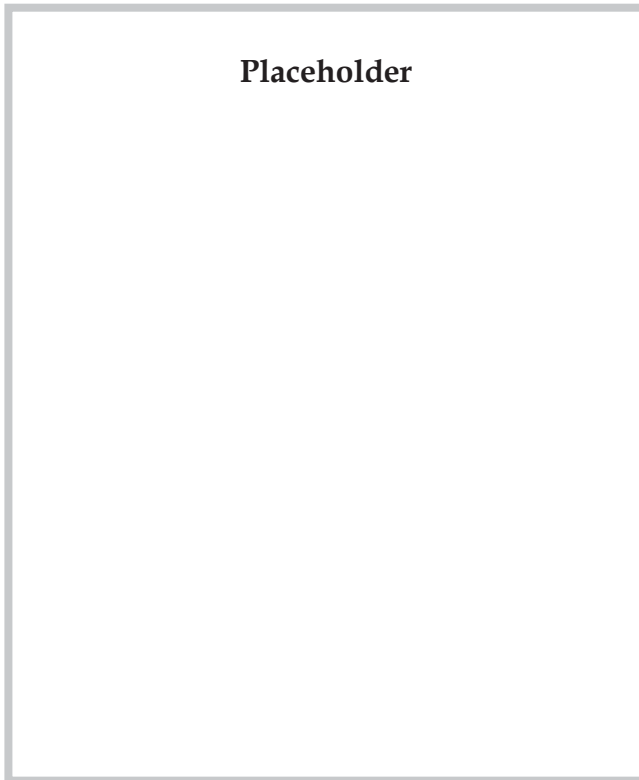
¹⁹ Nicholas Negroponte, *Soft Architecture Machines*. (Cambridge Mass.: The MIT Press, 1975), p. 150.

²⁰ Price, p. 93.

Generator - frames, linkages and infills

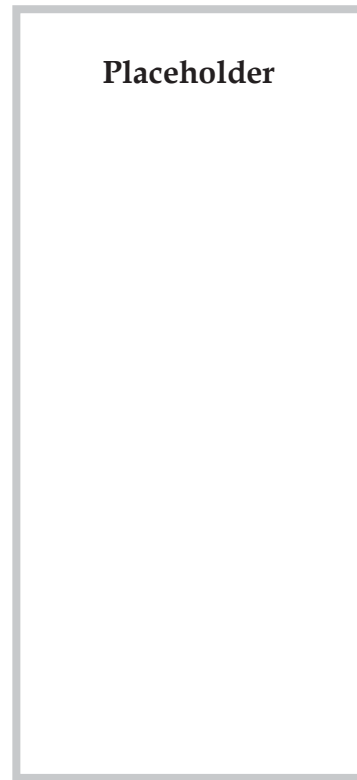


Menu 25: details of SW zone - ground level



0 4 20 m
2 8 scale 1:400

Various wet serviced cubes



0 1 5 m
0,5 2 scale 1:100

Fig.7
Generator, USA, C. Price with J. & J. Frazer, 1980: moveable parts are drawn in red

an American paper company Price proposed 'uncommitted or free space (...) as a continuing resource able to be fertilized by the introduction of built structuring which does not in itself and through its very form imply a particular use from the start' and its operational matrix to become a tool for the user rather than for the designer²¹. Price initially designed it as an analogue responsive project, but the set targets could only be achieved with the help of programmers John and Julia Frazer²², who 'equipped every component of the structure with a single chip microprocessor and therefore made it the 'first intelligent building' which controlled its own organization in response to use'²³ and had the ability to learn, driven by feedback, in an evolutionary process. In the Generator project (with Cedric Price), the authors mention that:

[t]he computer program was developed to suggest new arrangements of the site in response to newly defined needs. By embedding electronics in every component and making connections to the foundation pads, we effectively turned the site into a vast working model – a gigantic reconfigurable array processor, where the configuration of the processor was directly related to the configuration it was modelling.

They intended that the Generator would 'learn from the alterations it made to its own organization, and coach itself to make better suggestions'. And they state that

[u]ltimately, the building itself might be better able to determine its arrangement for the users' benefit than the users themselves. This principle is now employed in environmental control systems with a learning capability.²⁴

²¹ Price, p. 90.

²² Molly Wright Steenson, 'Cedric Price's Generator', *CRIT #69: The Journal of the AIAS*, 2010, 14-15 (p. 14).

²³ John Frazer, *An Evolutionary Architecture* (London: Architectural Association, 1995), p. 40.

²⁴ John Frazer, *An Evolutionary Architecture* (London: Architectural Association, 1995), p. 40-41.

The relevance of projects like the Generator is that they introduce the computer in the context of architecture at a whole new level, by aspiring to the learning ability of a design from its alterations and giving it the possibility to reconfigure itself according to these alterations.

2.6 SELF-ORGANISING AND SELF-ASSEMBLING SYSTEMS

Another project developed by the Frazers, this time with students of AA unit 11, in 1990, is the equally ambitiously named Universal Constructor: a three-dimensional array of individually intelligent and intercommunicating cubes, able to self-organize in an evolutionary way and to construct different spatial configurations on an informational level. Physically, though, the single units still had to be moved by a so-called interactor, who executed the constructor's commands.²⁵

Don Ingber at the Wyss Institute for Biologically Inspired Engineering (Harvard) works on blurring the boundary of living and non-living systems. Artists-architects like Philip Beesley and Omar Khan investigate the chemical properties of materials, like phase-changing materials, in order to generate responsive structures at an architectural/installation scale. These are functionally undetermined structures with an emphasis on physical experience.

2.7 CONCLUSION

In this chapter I have given an account of specific examples for the topic of flexibility. I have also informed the debate with the topics of participation and cybernetic principles that will go on to inform the design research.

²⁵ Frazer, pp. 44–49.

3 CONTEXT: SOCIETY, CULTURE AND TECHNOLOGY

3.1 INTRODUCTION

3.2 SHARING AND SMART MOBILE DEVICES

3.3 UBIQUITOUS COMPUTING / BUILDING AUTOMATION /
CONTROL

3.4 OWNERSHIP

3.5 THRESHOLDS AND PERSONAL SPHERE

3.6 CONCLUSIONS

3.1 INTRODUCTION

The following chapter aims to embed this research project in the contemporary developments of society, technology, culture and the economy in the second decade of the 21st century.

One of the questions of this chapter is: are there similar projects, products, schemes of distribution of expendable goods other than architectural space and how are they operated? How can these findings inform the research at hand?

Through the example of car-sharing, it will be argued that ubiquitous computing has enabled the boom in contemporary forms of sharing: this is considered to be the most relevant example for the current research since there are specific goods used for different shifts which is what I explore in the design phase. I intend to create a system of sharing by option that aims to create a surplus for the users by distributing unused space. The attitude of people towards their possessions is important as it indicates that there is a new culture emerging which is not only based on the accumulation of objects. Furthermore, I analyse the topic of thresholds as separation of spaces and ownership.

3.2 SHARING AND SMART MOBILE DEVICES

Sharing is a term that covers many different kinds of actions. The word sharing describes the joint or alternating use of finite goods as well as the process of division and distribution.

Today, in the second decade of the 21st century, sharing is a popular term even used as a catchword to promote the act of collaborative consumption: file-sharing, car-sharing, home-sharing, bike-sharing, the sharing of music,

videos, playlists, photos, current location and recently 'dynamic ride sharing'¹, etc.

The term sharing is used for both rival and non-rival goods. Rival goods are those whose consumption by one consumer prevents simultaneous consumption by other consumers², for instance a power drill (durable) or an apple (non-durable). Goods that are non-rival are goods that can be consumed (enjoyed) simultaneously by an unlimited number of consumers, like, for instance, a television programme.

So car-sharing, bike-sharing, home-sharing are examples of joint or alternate use of rival goods, whereas the sharing of files, photos, playlists, videos describes the distribution of non-rival goods.

In her TED-talk, 'The Case for Collaborative Consumption', Rachel Botsman identifies 'collaborative lifestyles: (...) the sharing of resources of things like money, skills and time'³ as one of the three main categories of collaborative consumption. In 2011 TIME magazine put 'Today's smart choice: Don't own it, share it'⁴ onto the list of the 10 ideas that will change the world. In her book 'What's mine is yours'⁵, Botsman outlines the renaissance of collaborative behaviours like sharing and the trust mechanics inherent in these systems. Factors which support these behaviours are, among others, digital technology and, as the cultural drivers of a new generation of users: 'Digital Natives, or Gen Y: they're growing up sharing - files, video games,

¹ Dynamic ride sharing describes a new means of transport in the city that allows instant hop-on/ hop-off car-sharing in fluid traffic.

² David Leo Weimer, *Policy Analysis: Concepts and Practice*, 4th ed (Upper Saddle River, NJ: Pearson Prentice Hall, 2005), p.72

³ 'Rachel Botsman: 'The Case for Collaborative Consumption' | Talk Video | TED.com' <http://www.ted.com/talks/rachel_botsman_the_case_for_collaborative_consumption/transcript> [accessed 22 May 2014]., (minute 9:49)

⁴ 'Today's Smart Choice: Don't Own. Share - 10 Ideas That Will Change the World' - TIME <http://content.time.com/time/specials/packages/article/0,28804,2059521_2059717_2059710_00.html> [accessed 22 May 2014].

⁵ Rachel Botsman and Roo Rogers, *What's mine is yours: the rise of collaborative consumption* (London: Collins, 2011).

knowledge. It's second nature to them. So we, the millennials (...) are like foot soldiers, moving us from a culture of 'me' to a culture of 'we' ⁶.

One example for the benefits of sharing in contemporary culture is the system of car-sharing. Looking deeper into the history of car-sharing in Germany, in 1997 15,000 users shared 1,000 cars (~15 users/car), in 2007 (year of introduction of the iPhone) 100,000 users shared 3,000 cars (~33 users/car). From 2011 (the first year that smartphone purchases outnumbered conventional phone purchases⁷), when 210,000 users shared 5,000 cars (~42 users/car) until 2014 when 750,000 users shared 14,000 cars (~53 users/car), the amount of participants in German car-sharing schemes grew by 350%. About 75% of that growth has been generated by users of so-called free-floating systems, where the cars to share have no fixed pick-up and drop-off location but can be left for the next user at any convenient location within the area of the scheme⁸.

Participants intending to use a car can locate these either on the internet or through smart mobile devices.

There is a relation between the implementation of smart mobile technologies and the boom of car-sharing, as consumers begin to see how technology, especially mobile technology, makes sharing between strangers easier and safer⁹. The original idea of car-sharing is the alternate use of rival goods (the car). But what makes car-sharing increasingly successful today is the new added component of sharing the non-rival goods of real-time updated information in the form of peer-to-peer sharing of sensory data.

⁶ 'Rachel Botsman: The Case for Collaborative Consumption | Talk Video | TED.com'. (minute 6:50)

⁷ 'Statistik: Absatz Der Smartphones so Hoch Wie Noch Nie - Technik, Trends & Web 2.0' <<http://xyonline.de/2012/05/statistik-absatz-der-smartphones-so-hoch-wie-noch-nie/>> [accessed 26 May 2014].

⁸ 'Carsharing - Autos Nutzen Statt Besitzen' <<http://www.vcd.org/carsharing.html>> [accessed 26 May 2014].

⁹ 'Baby, You Can Drive My Car: How Car Sharing Teaches Us to Be Good Neighbors | Grist' <<http://grist.org/business-technology/baby-you-can-drive-my-car-how-car-sharing-teaches-us-to-be-good-neighbors/>> [accessed 5 September 2014].

Placeholder

Source:

© Statista 2014

Placeholder

Fig.8
Percentage of smartphone users for all mobile phone owners in Germany from
January 2010 to August 2013 (top)
Development of the car sharing industry in Germany 1997-2014 (bottom)

Where am I? Where is the car? How much petrol is in the car? How long does it take me to walk there? This information - shared and distributed by ubiquitous computing - enables users to set off spontaneously without the hassle of booking in advance and without the obligation to return the car to the base location, resulting in personal benefit. As stated in the book 'Smart Cities': '[i]n San Francisco, Uber can summon a taxi with one click¹⁰'. The book is from 2013. Uber is now a platform for every citizen, allowing a flexible system of spontaneous rides in different cities.

3.3 UBIQUITOUS COMPUTING / BUILDING AUTOMATION / CONTROL

In architecture, ubiquitous computing and smart personal devices play a significant role, introducing terms like Smart Building and Smart City which are commonly used in advertisement strategies.

The digital revolution didn't kill cities. In fact, cities everywhere are flourishing because new technologies make them even more valuable and effective as face-to-face gathering places¹¹.

The relationship to the spaces we inhabit in the western world is increasingly mediated by technology. New apps come on the market every day that allow the user to interact with their environment in new ways and either receive information on it or actually control it. At home apps are allowing inhabitants to control their environment, temperature, light, music, etc. Therefore there is a direct connection between ubiquitous computing and the environment the user is surrounded by, allowing a change in this environment through mobile devices.

¹⁰ Anthony M. Townsend, *Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia*, First edition (New York: W.W. Norton & Company, 2013), p. 232.

¹¹ Townsend, p. 7.

In *The Social Nexus*, Carlo Ratti and Anthony Townsend identify ‘intelligence that is bubbling up from millions of newly cyber-connected residents¹².’

This possible new intelligence is facilitated by a technological milestone unrecognized by the majority of internet users: the IPv6 internet protocol¹³, providing a possible amount of 47x (10)²⁷ internet addresses for each single human on planet earth as from 1 June 2014¹⁴.

A fraction of this amount of addresses will provide the foundations to what is called the Internet of Things (IoT). IPv6 allows the allocation of an internet identity to even the smallest everyday item via cheap miniature computers or sensors for data collection like the IC Tag System¹⁵.

They continue by saying that ‘the internet of things, the new generation of internet-connected devices, isn't embodied in expensive household appliances (...). It's more likely to be a sensor that costs pennies, made by the millions, and distributed across the city’¹⁶.

Ratti and Townsend state that ‘residents of wired cities can use their distributed intelligence to fashion new community activities, as well as a new kind of citizen activism’¹⁷.

It is also a fact that ‘peer-to-peer sharing of sensory data can have a huge impact in helping to manage urban infrastructure’¹⁸.

However the new ‘smart cities’ need to be critically analysed. Every informatics system has the potential to be breached-in and hacked. Hacking, meaning exploring weaknesses in computer systems or networks and

¹² ‘The Electric City: Urban Age Electric City Conference London 6-7 December 2012.’, ed. by Burdett, Ricky and Rode, Philipp, eds. (2012) (The London School of Economics and Political Science, Alfred Herrhausen Society, London, UK), p. 15 <<http://eprints.lse.ac.uk/50378/>>.

¹³ ‘World IPv6 Launch’ <<http://www.worldipv6launch.org/>> [accessed 1 June 2014].

¹⁴ ‘World Population Clock: 7 Billion People (2014) - Worldometers’ <<http://www.worldometers.info/world-population/>> [accessed 1 June 2014].

¹⁵ *Intelligent Environments: Methods, Algorithms and Applications*, ed. by Dorothy Monekosso, Paolo Remagnino, and Yoshinori Kuno, Advanced Information and Knowledge Processing (London: Springer, 2009), p. 59.

¹⁷ Burdett, Ricky and Rode, Philipp, eds. (2012), p. 15.

¹⁸ Burdett, Ricky and Rode, Philipp, eds. (2012), p. 15.

potentially gaining access to sensitive private or confidential information that can be misused or forwarded. This allows me to conclude that the moment, information is mediated by technology and controlled by an informatics system or network, it is no longer 'private', since access to this information is possible by others: hackers, authorities (like the recent NSA surveillance disclosures by Edward Snowden), institutions and corporations. I believe that the discussion about the handling of private, sensitive and confidential information will occupy the next decade. In the present research, the informatics system could be a community-based, cooperative system of distribution.

3.4 OWNERSHIP

In 1993, Peter Menzel, a photo reporter, started a project consisting of photographing 30 families together with their belongings in 30 different countries¹⁹. He had the support of the UN and the World Bank in finding representative families. The families were photographed outside their homes next to their possessions. The resulting photos express the differences between cultures regarding material possessions. By looking at the photos one can conclude that the more westernized the families, the more items they possess. In 2001 Menzel visited 6 of the 30 families again in order to record eventual changes. For example, the family Natomo in Mali had increased from 11 to 15 people from 1993 to 2001, however their possessions barely changed. The Japanese family, on the other hand, from 1993 to 2001, increased the already large number of items they possessed.

This demonstrates that the relationship to possessions is cultural. If the cultural and economic context of individuals change, this relationship changes. Nowadays there are emergent behaviours that challenge the tendency towards more possessions proportionally to the economic

¹⁹ Peter Menzel, 'Die Materielle Welt der Familien - ein globales Portrait' in Arch+ 206/207, Politische Empirie, Globalisierung, Verstädterung, Wohnverhältnisse, July 2012, pp.98-103

development of a specific culture. In western countries, where consumerism has marked the twentieth century, awareness towards the excess of possessions starts to emerge. Movements like the '100 Thing Challenge', a grassroots movement where people aim to reduce their belongings to only 100 items²⁰, express the tendency towards less ownership. (The philosopher Diogenes was one of the first to advocate a life without possessions.)

In the film 'Fight Club'²¹, the character Tyler Durden states that 'the things you own end up owning you'. This quote is also mentioned by Rachel Botsman and Roo Rogers²² when describing the position of this character and the main theme of the film as being a critique of consumerism.

Another shift that contributes to the decreasing ownership of physical items is the transformation of former tangible goods into intangible goods, with the advent of digitalization²³.

This leads to a possible personalization of spaces through technology and interfaces and not through physical goods, i.e. playing one's favourite playlist from the mobile device.

These tendencies can play a role in defining one's personal space not only through the amount of items one owns, but also through the way people program their personal space. This opens up the way to speculate on different categories of thresholds to define what separates 'my space', where 'my possessions' are, from others. This is relevant to my research because I want to ensure that one person's own space and possessions are separated

²⁰ 'Get Rid of Clutter: 100 Thing Challenge Helps Shed Stuff - TIME'
<<http://content.time.com/time/magazine/article/0,9171,1812048,00.html>> [accessed 5 June 2014].

²¹ *Fight Club*, dir. by David Fincher (20th Century Fox, 1999)

²² Rachel Botsman, *What's Mine Is Yours the Rise of Collaboration Consumption* (New York: HarperCollins, 2010), p. 42.

²³ Nowadays, people can consume music, films, newspapers, magazines as intangible goods instead of in their physical form of records, CDs, DVDs, paper. It is possible to store the personal choices of intangible goods in mobile devices, like storing data in a hard drive.

from others' space and possessions. In this sense it is relevant to analyse what can separate these spaces.

3.5 THRESHOLDS AND PERSONAL SPHERE

In this text I will outline the importance of thresholds in defining spaces.

Thresholds are separations of space. These separations are relevant to my thesis since I will test different kinds of thresholds in order to divide programmes, e.g. by a firm wall or by soft textiles.

There is a multiplicity of thresholds present in the home since the Victorian concept of privacy and publicness²⁴.

The separation of spaces takes place in several ways and through different media. There are also psychological and cultural thresholds like, for instance, language barriers creating different spaces in a room. These are floating and negotiable. 'The personal sphere can be seen as a representation of the real need of physical space. The personal sphere can vary and adapt in size and form, from very big to almost touching the skin. Or it can expand to the limits of the physical space'²⁵.

The continuous mutations of the personal sphere and its reconfiguration in the case of the sharing of space are used as an input for the design. This leads me to the assumption that there is a needed space around the body which is necessary to differentiate your personal sphere from others. This space is variable: in some situations, like in an underground train, it is almost reduced to clothes and skin, therefore to the volume your body alone occupies. This expands if you are carrying a suitcase or any personal objects. In other situations, like at home, your personal sphere corresponds to the

²⁴ Georges Teyssot, 'Fenster, Zwischen Intimität und Extimität' in ARCH+ 191/192: Schwellenatlas, March 2009, pp.53-59 (translation by FW)

²⁵ Florian Wurfbaum, RCA Architecture Annual 2011, P. 154 (see Appendix)

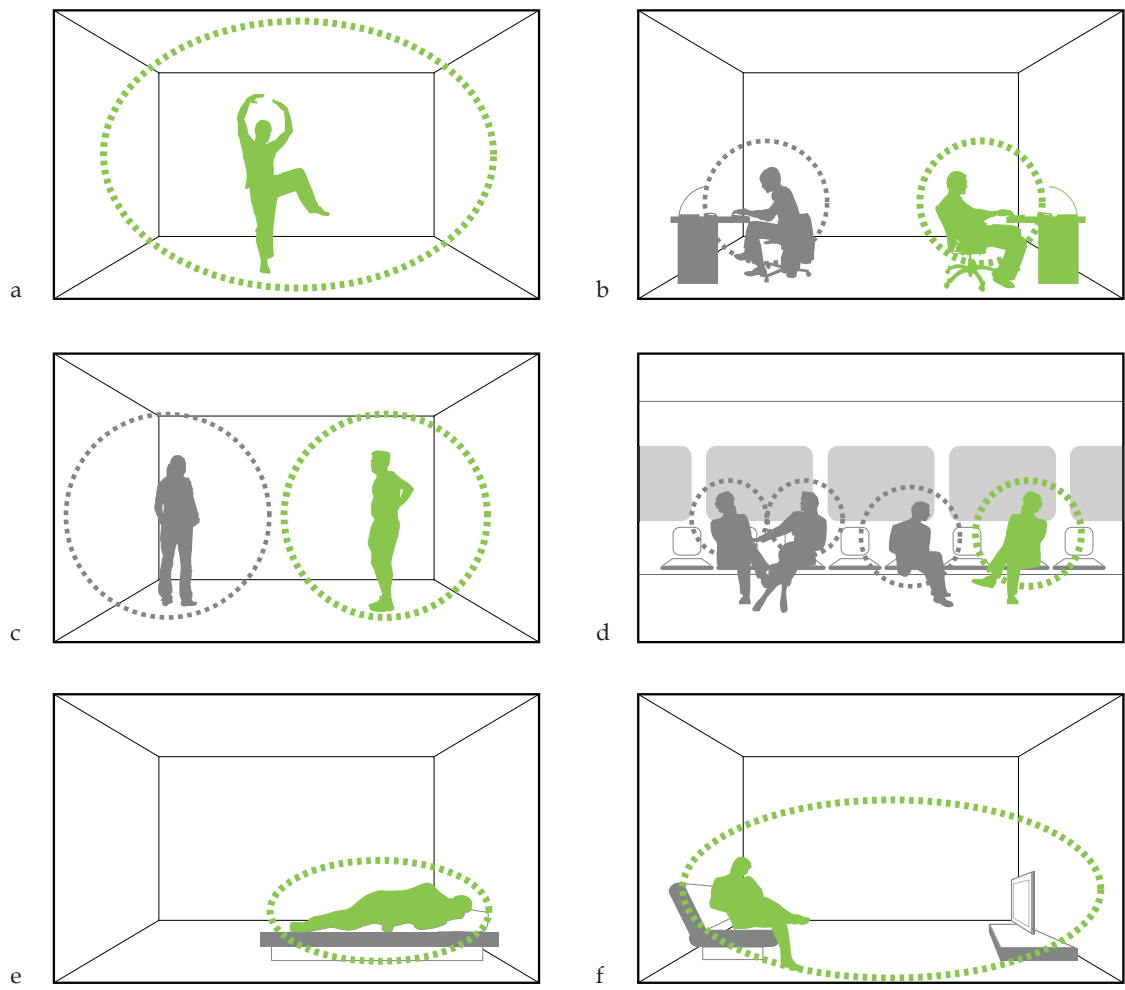


Fig.9
 Personal sphere, different enlargements in different spatial situations

walls that encapsulate your flat, or house. This is your personal sphere, the personal space which assumes different forms according to the specific social, cultural and emotional situation in which you find yourself at one moment. This has led me to the conclusion that at home or in your workspace there should be a guaranteed space when you are present. This is always yours and contains your personal objects and furniture, and your personal sphere can enlarge to the boundaries of the spatial entity you inhabit at that moment.

In regard to the topic of living together, Peter Sloterdijk uses the expression 'foam' to designate density and he states that 'who takes density seriously comes to praise the wall'²⁶ (meaning that those who advocate for density value the properties of the wall as a dividing element).

3.6 CONCLUSIONS

One of the goals of this chapter was to explore similar projects, products, schemes of distribution of expendable goods other than architectural space and how they operate. These findings inform the brief for the case studies.

Responding to the relationship between the research question and contemporary technology I conclude that new technologies can allow new real-time distribution systems.

After discussing the personal space and personal sphere, I concluded that at home or in your workspace there should be a guaranteed space when you are present. When one is absent, the home or the workspace is still a container of objects and furniture, therefore it was relevant to analyse the topic of possessions in contemporary society and emergent behaviours.

²⁶ Peter Sloterdijk, 'Architekten Machen Nicht Anderes Als In-Theorie.', *ARCH+, Zeitschrift Für Architektur Und Städtebau*, Architekturen Des Schaums, 169/170 (2004), 16-23 (p. 22)(translated by FW)

In order to preserve the ownership of space there need to be thresholds between different spaces with different programmes and owners. These separations are relevant to my thesis since I will test different kinds of thresholds in order to divide programmes.

4 **PATTERNS OF USE, USER IDENTIFICATION, CONTROL**

4.1 INTRODUCTION

4.2 PATTERNS OF USE AND USER IDENTIFICATION

4.3 CONTROL AND PARTICIPATION

4.4 CONCLUSION

4.1 INTRODUCTION

This chapter analyses patterns of use of conventional buildings, identifies possible users of the proposed building and approaches references and strategies of control for an architecture that changes.

4.2 PATTERNS OF USE AND USER IDENTIFICATION

The users of the envisioned architecture are to be identified from two different user groups constituting complementing patterns of use in time.

I collected patterns of use in different buildings in order to make a pre-selection of complementing programmes for the envisioned building. These activities take place at certain times of the day and week. Some activities in buildings occur in a 24/7 cycle, for instance hospitals or shift work factories. Inspired by the diagram of activity patterns Koolhaas developed for the Yokohama harbour urban design forum in 1992¹, I developed a series of diagrams to combine complementing activities (p. 53ff). I applied different methodologies to map these activities. These included a survey amongst dwellers (housing)², a telephone interview with a representative of the hotel lobby in Germany (hotel)³, informal interviews with teachers (kindergarten & school) and internet time-plans for the use of lecture halls in the department of Physics of the TU Munich⁴ (university); daily observations of an office building in Müllerstrasse, Munich and a desk utilisation chart in a finance department⁵ (office); an interview with a building manager (administration building)⁶, a conversation with an artist, observations of timetables of mass and a cinema (church+cinema). These diagrams reveal the following findings: some activities have 'step-style' diagrams indicating

¹ Rem Koolhaas and Office for Metropolitan Architecture., *Small, Medium, Large, Extra-Large: Office for Metropolitan Architecture, Rem Koolhaas, and Bruce Mau*, 2d ed. (New York N.Y.: Monacelli Press, 1998), p. 1221.

² For survey and questionnaire: see appendix

³ Tobias Warnecke, interviewed by the author, 2.June 2014 (see appendix)

⁴ 'Physik-Department Der TU München | Lehrangebot'
<<http://www.ph.tum.de/studium/mh/plaene>> [accessed 26 May 2014].

⁵ 'Reducing Office Space through Flexible Working'
<<http://www.flexibility.co.uk/flexwork/offices/office-shrinking.htm>> [accessed 7 September 2014].

⁶ Hans-Jürgen Baumgart, interviewed by the author, 24.August 2011 (see appendix)

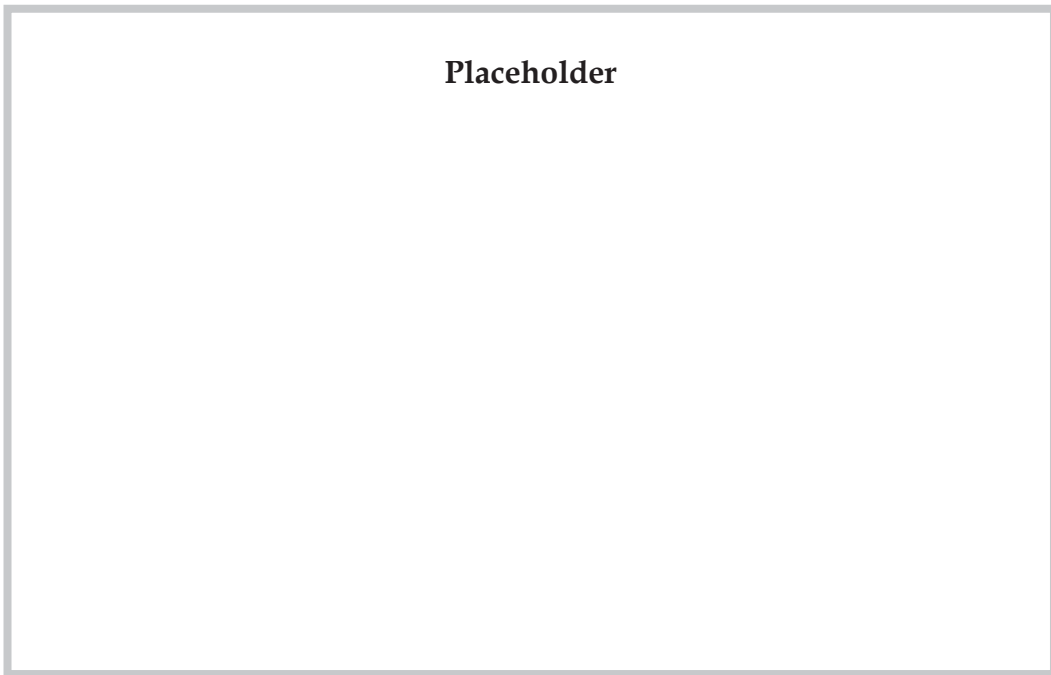


Fig.10
Yokohama Harbour Urban Design Forum, Rem Koolhaas, 1992:
"assemblage of programs" representing 24 hours

that these activities follow a rigid time plan, like school, cinema or church where the activities follow a predetermined schedule. 'Soft-style' diagrams indicate gradually changing degrees of activities like in the hotel and the residential building (housing).

I combined the diagrams with complementary activities and selected housing and offices for further investigation. These two programmes are regarded as most relevant of all possible combinations as they play a major role in the daily activities of western societies.

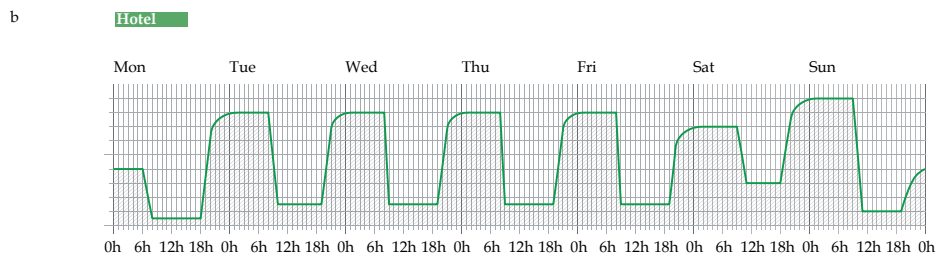
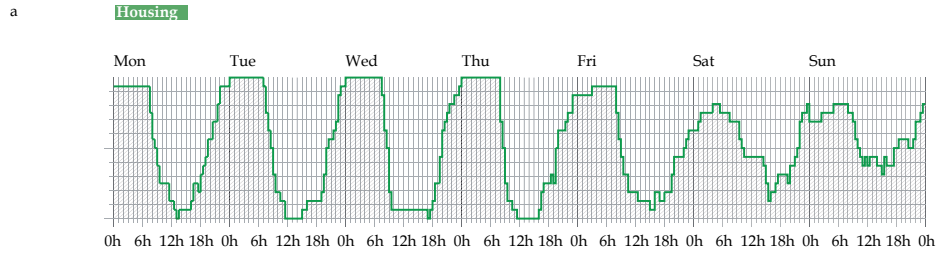
These two programmes also affect a high number of buildings. The hypothesis is, thus, to combine the two programmes - administration building and dwelling for one-person households.

Administration Building

In order to get reliable data I have carried out an exemplary pattern of use study at an administration building, built in 1999 in Munich, Germany, by interviewing the building manager⁷. The institution is the building division of the municipal administration of Munich, responsible for the erection, maintenance and demolition of all built structures (e.g. schools, theatres, town halls, public galleries, administration buildings, streets, tunnels, parks...) owned and/or run by the city of Munich. In the building in Munich's Friedenstraße 40 some 73,000 m² gross floor area (not including areas below ground) are used by some 1,500 officers and employees in some 1,200 office rooms. The work time scheme allows staff to start and finish whenever they want but they must guarantee their presence in the core five hours between 9:30am and 2:30pm. In theory, staff could start as early as 6am and finish as late as 6:30pm. However, according to the building manager, the vast majority of staff work between 7:30am and 4:30pm on weekdays. Before 7:30am and after 5:30pm and at weekends staff work only very sporadically, with no more than 5% in the building at any time. Some

⁷ Hans-Jürgen Baumgart, interviewed by the author, 24.August 2011 (see appendix)

Private Area



Education

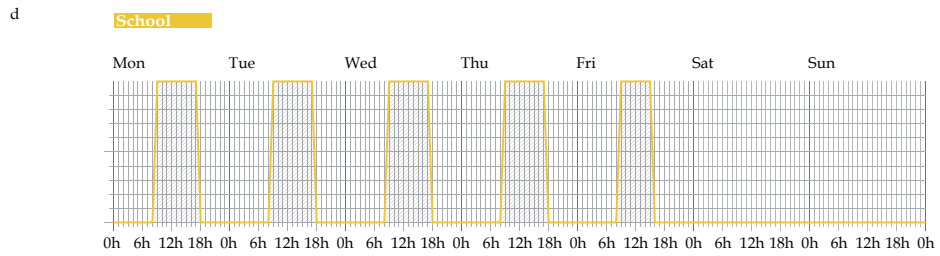
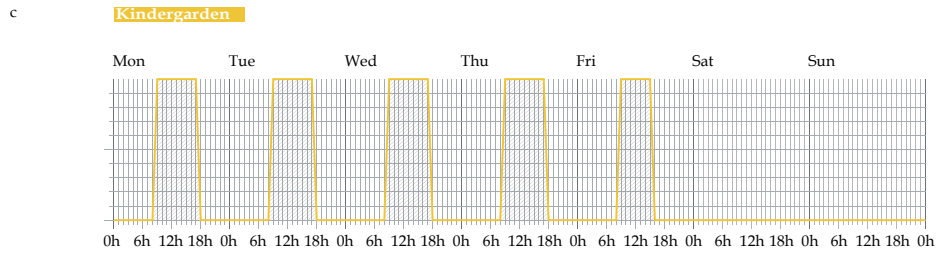
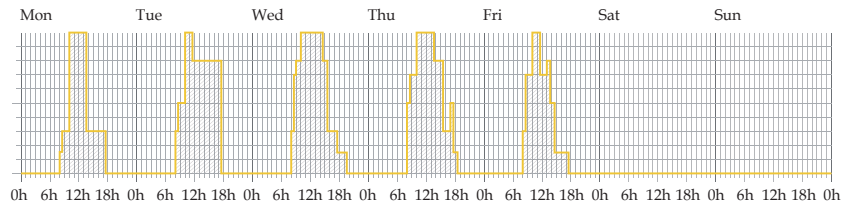


Fig.11
Patterns of use taking place in buildings representing the seven days of a week

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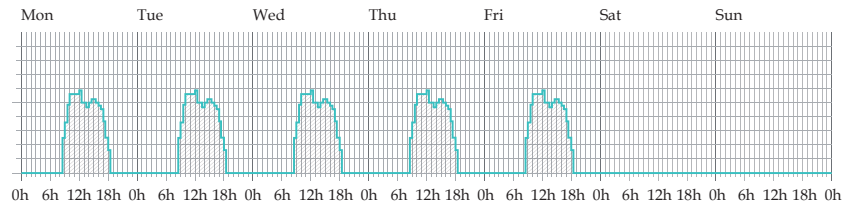
University



Work

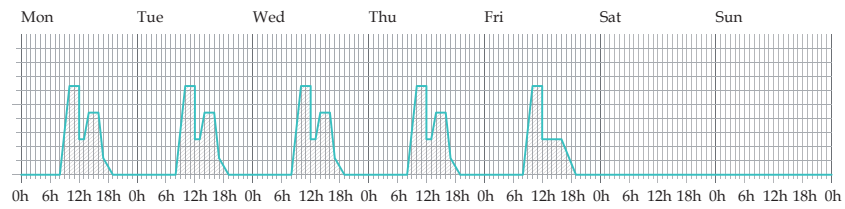
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Offices



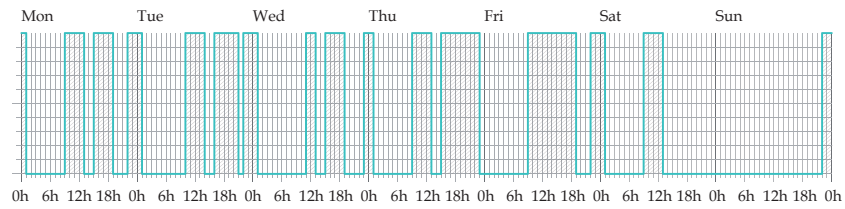
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Administration Building



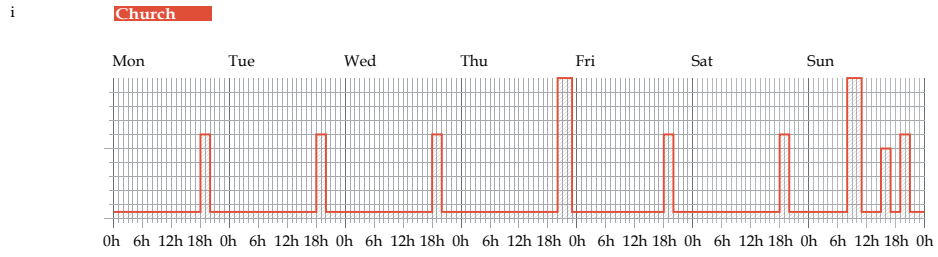
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Artists Atelier

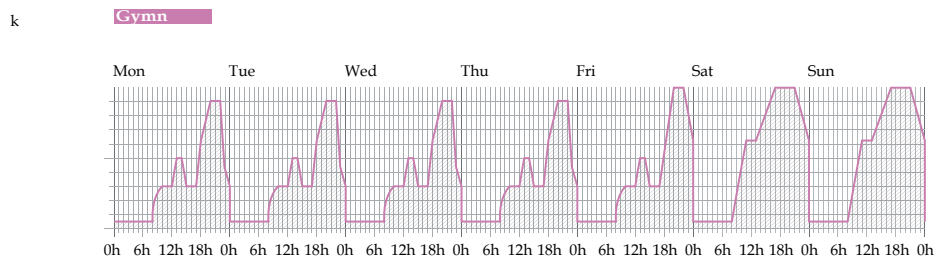
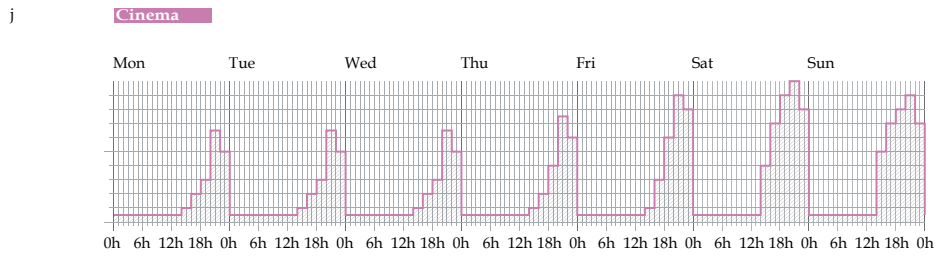


Patterns of use taking place in buildings representing the seven days of a week

Religion



Entertain - Culture



Combined Utilisation Patterns

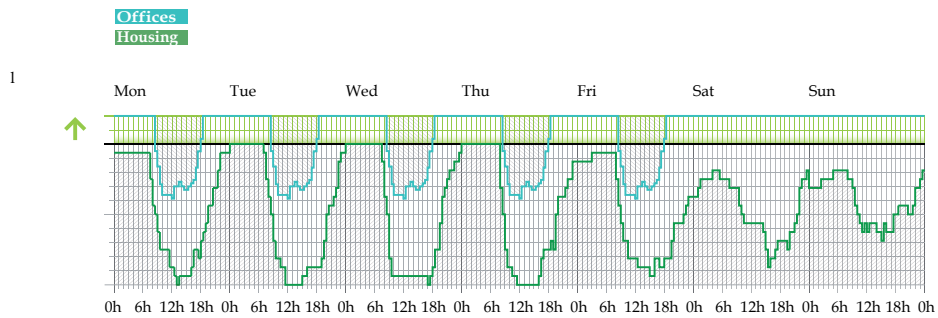


Fig.13
Patterns of use taking place in buildings representing the seven days of a week

spaces in the building can be rented in the evening, for private events, e.g. the canteen, the big entrance hall, meeting rooms⁸.

The observation can be made that some 70,000 m² of floor area are unused for some 118 hours of a 168 hours week, which means it is unused more than 70% of the time.

By analysing the data I pose the question: who could be the dwellers to use the 70% of unused space of the administration building? Ideally, these people would have a predictable routine, e.g. leaving their home every day to go to work or to university.

Today there are tendencies in the UK and in the US towards alternative work schemes, like teleworking, that allow staff to work from home. This results in the phenomenon of people spending their work time at home. However, '[h]ome working doesn't suit all jobs or sectors'⁹.

So the appropriate dwellers could be people who do not have the ability to work as teleworkers, people in the production industry or city traders, who need to physically be at their work place.

Dwelling building

Apart from the professional occupation of the dweller, a second factor seems to be even more relevant: the amount of dwellers in a single dwelling. This is important as fewer dwellers assure more rigid patterns of use. A one-person household dwelling is unused when the one person leaves the dwelling. A household with more people is unused when all people have left the dwelling. Therefore a one-person household would provide a desired rigidity in its pattern of use.

⁸ Hans-Jürgen Baumgart, interviewed by the author, 24. August 2011 (see appendix)

⁹ 'BBC News - Home Working: Why Can't Everyone Telework?', 2011
<<http://www.bbc.co.uk/news/magazine-11879241>> [accessed 18 September 2011]. Further the article states '[t]here are some sectors of the UK economy where teleworking is impossible - retailers, manufacturers and City traders are among those where most people have to be at the workplace. In theory, call centres could allow staff to work from home. In practice, the cost of linking secure databases to thousands of houses stands as a considerable obstacle'.

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue.

Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 Do you live in a one - person household? Yes No

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (tick the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days. Tick/untick boxes for times when you are at your house, leave boxes plain for times you spend out of house (in excel change colour). Some boxes are pre-ticked to common user patterns, please remove / add according to your personal records.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (kreuzen Sie die jeweiligen Zeitschritte an). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren. Die Tagespläne sind entsprechend einem häufigen Nutzungsmuster vor-ausgefüllt, bitte entfernen / füllen Sie Kreuzchen entsprechend Ihrem persönlichen Tagesverlauf zu.

3 Would you estimate the week you recorded above as a typical and representative week? Yes No

4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No

5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house

6 Employment status employed self-employed unemployed student in training

7 Do you work full-time part-time without clearly defined timeframe?

8 Do you work at home, even if it's just occasionally? Yes No

9 If yes, how many hours on these days on average? Mo Tu We Th Fr Sa Su

10 Do you regularly stay overnight away from home for business/trips or similar? Yes No

11 If yes, how many days per month on average? Days / Month

12 How many days of holiday do you take per year? Days

13 Out of these holidays, how many days and nights do you spend away from your home? Days

14 If you are not living in a one person household, how many persons live in your flat / house? Persons

15 Where is your home/flat? Postcode City Country

16 How many rooms of the following category does your flat/house have? Bedrooms Livingrooms Kitchen or Kitchen-Diner Bathroom WC (separate) other rooms (please state)

17 How big is your flat / house? < 20 m² 20 - 30 m² 30 - 40 m² 40 - 50 m² 50 - 60 m² 60 - 70 m² 70 - 80 m² 80 - 100 m² 100 - 120 m² > 120 m²

18 For how long have you been living in your current flat/house? Months Years

19 From now, for how long are you planning to keep staying in the flat/house you currently live in? Months Years

20 Do you own or do you rent the place you live in? own rent

21 Do you use any of these items? MP3 Player Tablet PC (iPad) Smartphone Kindle or other eReader

22 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future? Not likely at all unlikely don't know likely very likely

23 Do you store any data in the cloud? I don't know what the cloud is Yes No

24 Are you on Facebook or any other social network? I don't know what Facebook is Yes No

25 How many hours of your free time do you spend per week on the internet? Hours/Week

26 Personal information: Gender? female male

Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60

4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No

5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house

6 Employment status employed self-employed unemployed student in training

7 Do you work full-time part-time without clearly defined timeframe?

8 Do you work at home, even if it's just occasionally? Yes No

9 If yes, how many hours on these days on average? Mo Tu We Th Fr Sa Su

10 Do you regularly stay overnight away from home for business/trips or similar? Yes No

11 If yes, how many days per month on average? Days / Month

12 How many days of holiday do you take per year? Days

13 Out of these holidays, how many days and nights do you spend away from your home? Days

14 If you are not living in a one person household, how many persons live in your flat / house? Persons

15 Where is your home/flat? Postcode City Country

Fig.14
Survey: Questionnaire

In Munich, more than half of all households are one-person households. 40% of these are inhabited by dwellers in the age between 20 and 40 (in total about 200,000 households)¹¹.

These are regarded as a suitable complement for the administration offices. Finally I assume that young professionals or students could be some of these single-person dwellers between 20 and 40.

In order to find out about home use patterns of specific individuals, I created a survey. This was based on outlining the seven days of the week with their twenty-four hours. These were to be completed with the individual's record of seven consecutive days of their routine. I expected to extract specific patterns of use, based on the personal records each individual made of her/his presence and absence at home.

The sample size of the survey was 16. I handed out 40 questionnaires, predominantly to people who matched the demographic target profile (age between 20 and 40). Out of 40, 18 were returned, and of these, 16 were valid.

One third (about 37%) of the survey participants live in a single-person household. More than half of them (56%) were students. 62% were in the age between 20 and 40. The graphically analysed record of hours spent at home revealed a homogeneous picture of dwelling use. On weekdays, more than 80% of the participants had left their homes in the morning by 9:30am. From 9:30am to 6pm only a few (between 4% to 20%) were at home. From 6pm the remaining 80% gradually came home until 11pm. (see also graphic next page). The collected information matched my initial hypothesis allowing me to move into the next stage. The aim is to use the data from the survey and feed it into the patterns of use of the proposed design.

¹¹ '2014-03-24_Haushaltsprognose_Onlinepublikation.pdf', p. 6
<http://www.muenchen.de/rathaus/dms/Home/Stadtverwaltung/Referat-fuer-Stadtplanung-und-Bauordnung/stadtentwicklung/grundlagen/2014-03-24_Haushaltsprognose_Onlinepublikation.pdf> [accessed 18 August 2014].

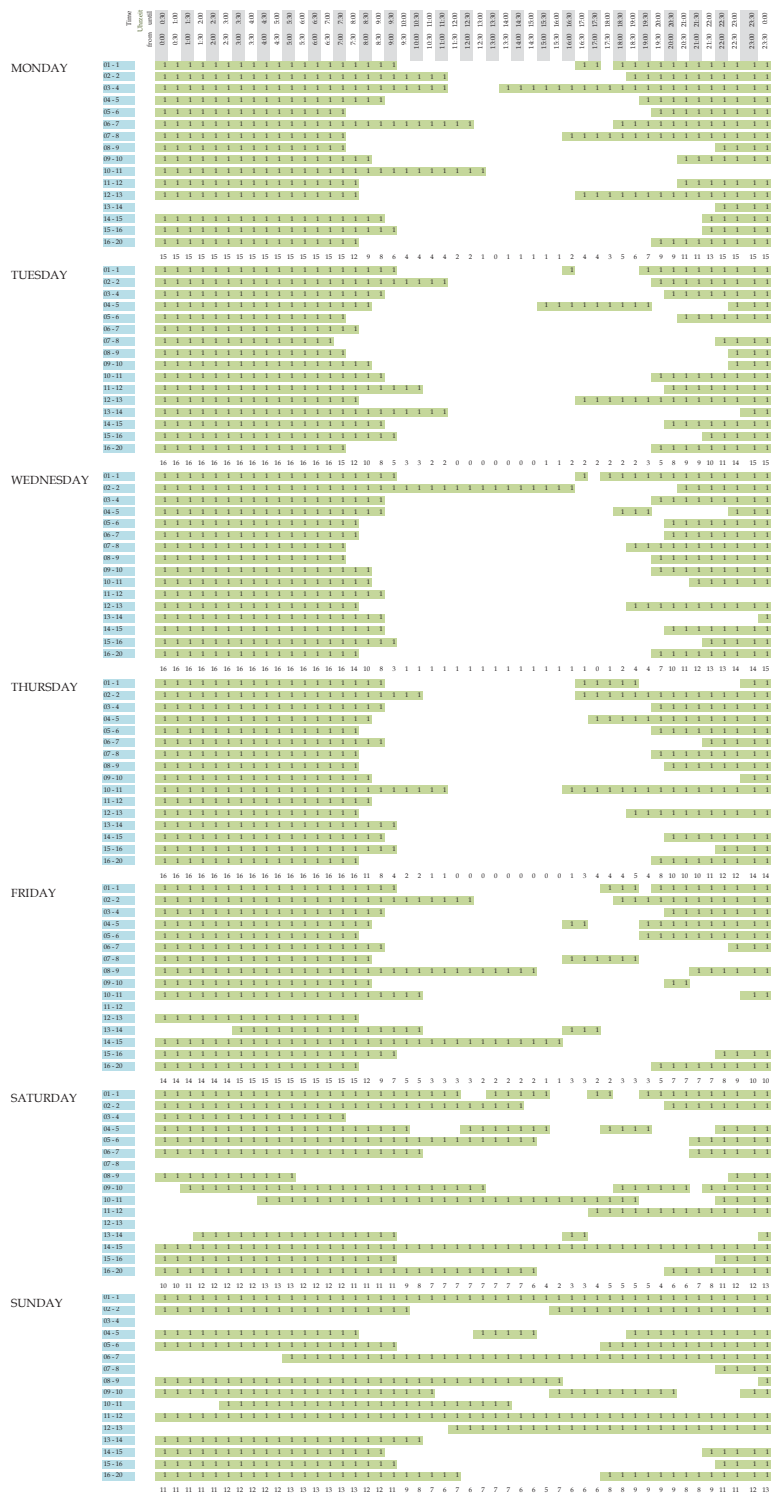


Fig.15
Survey: Participant's recorded presence at their house over one week

4.3 CONTROL AND PARTICIPATION

Wherever moveable or flexible structures, but also systems of flexible use without physically changing items are installed, the topic of control needs to be discussed: (Who controls the space? Who controls the system that controls the space? And who designs the system of control?)

In Beaudouin, Lods, Bodiansky and Prouvé's *Maison du Peuple* of 1939 at Clichy in Paris the building changed through the orders of an individual who was not necessarily the user of the building (top-down strategy).

Cedric Price's early projects promoting participatory ideologies still had a top-down aspect within them. His envisioned cranes and moveable portakabins were to be operated by people who were the translators of the people's commands.

Together with the emergence of computers in the 1950s and with the first cybernetarian thoughts, the controlling instance of flexible systems was converted from a top-down to a bottom-up approach.

John Frazer, in *An Evolutionary Architecture*¹², describes well an ambitious approach to control. Points 6 and 8 are particularly relevant to the current work, when he states that the model:

6. will derive order from its environment and be controlled by a symbiotic relationship with its inhabitants and that environment.

(...)

8. can anticipate the outcome of its actions and therefore can be said to have some intelligence. All the parts of the model cooperate and in that sense it can be considered as an organism, but it will only fully exist as such if it is a member of an evolving system of organisms interacting with each other as well as with the environment.

In relation to control, I intend to design a model of distribution of space, where each user has the choice of participating or not. This will be a system

¹² John Frazer, *An Evolutionary Architecture* (London: Architectural Association, 1995), p. 103.

of sensing and actuation operated according to the presence/absence of the users and further adjustable by the users' personal desires.

4.4 CONCLUSION

I used diagrams to visualize the time needs and spatial occupation of different activities in a typical week. A combination of analytical data and interviews provided data that was visualised in the diagrams. Diagramming allowed me to evaluate the possible compatibility of different activities and to select which activities to investigate further: dwellings and offices.

The assumption that the administration offices could be complemented with dwellings for people in the age range of 20-40 in one-person households appears plausible.

This conclusion was supported by the following sources: a survey and an interview.

The survey was made with the goal to gather specific data about patterns of use. The results of the survey are limited to the survey response (sample size 16) and to their behaviour in a specific week, since there would be moments of exception, also in these individuals' routines (for instance, when relatives or friends are visiting or when they are ill or on holiday). The size of the survey was sufficient to proceed to the next stage. The intention was not to generalize from the results but rather to obtain information to design from.

I also explored briefly the issue of control, since this will be important to create the desired system of spatial distribution in the case studies.

In the next chapters I will develop the system of distribution of space, first in a speculative approach (through geometrical and algorithmic exercises in the Chapter Elastic Architecture) and secondly in a site-specific approach applied to a specific building (Chapter Case Studies).

5 ELASTIC ARCHITECTURE

5.1 INTRODUCTION

5.2 ZUFALL

5.3 INTERWOVEN PATHS AND ORTHOGONAL INTERPENETRATION
MODELS

5.4 INTERACTIVE ELASTIC MODEL

5.5 DIGITAL MODELLING

5.6 SIMULATION 1

5.7 SIMULATION 2

5.8 SIMULATION 3

5.9 CONFIGURATIONS AND TECTONIC APPROXIMATIONS

5.10 CONCLUSION

5.1 INTRODUCTION

My house is diaphanous, but it is not of glass. It is more of the nature of vapour. 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 of their own space, which is infinitely extensible¹.

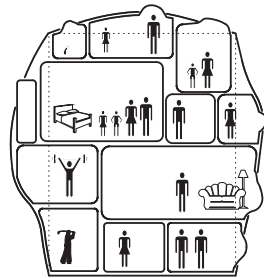
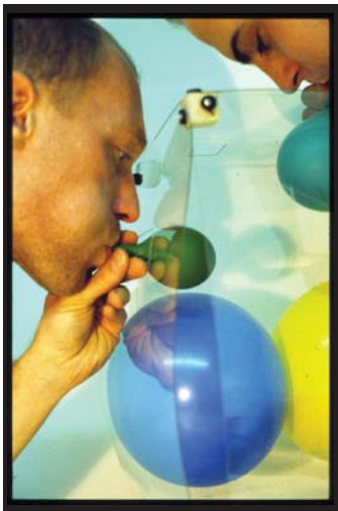
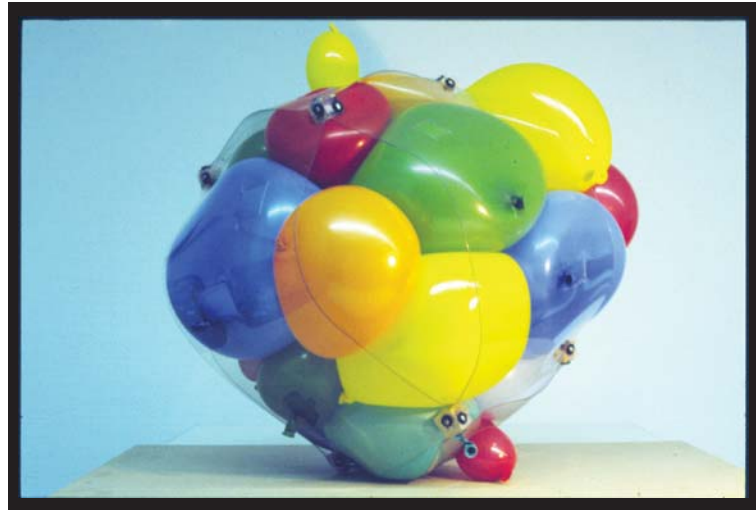
The walls of Spyridaki's house contract and expand. This is a poetic description and very elucidative of spatial desires translated into actual tectonic real-time changes.

The following studies, called Elastic Architecture can be described as a journey and intuitive process through geometrical experiments, exercises, phenomena and observations. These aim to answer the following questions:

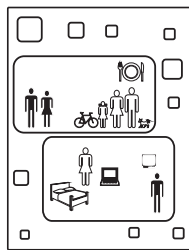
In a speculative approach (neglecting building material properties), which spatial 3d-models could be designed in order to support the idea of a fast responsive architecture, benefiting from 3-dimensional expanding and shrinking properties, that is capable of :

- containing at least two spatially separated programmes with indirect proportionally oscillating degrees of utilisation?
- assigning spatial volume according to the degree of utilisation?

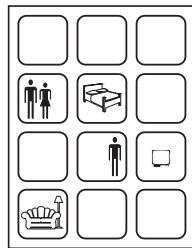
¹ Georges Spyridaki, *Mort Lucide*, (qtd. in Gaston Bachelard, *The Poetics of Space [La Poétique de L'espace, 1958]*, Trans Maria Jolas (Boston: Beacon Press, 1994), p. 51.



Jack of all trays, fully utilised:
 Sunday evening, as now everybody is at home, the inner pressure grows, the perforated skin changes its shape and the inner cells project onto the streetspace through the perforated skin.



Jack of all Trays:
 Ed and Stefi are at home. Their friends Peter and Jutta with their little daughter Fanny and Harry the dog just popped in for a coffee. As the neighbours are away, there is plenty of room so that Fanny can test her new bicycle. At the same time Felix, who's flat is currently downstairs, is having a guest from Portugal.



Conventional building:
 Most of the time the rooms within the building are not being used. During that time the rooms just work as containers for furniture and tv-sets.

Fig.16
 Elastic Architecture Series: Zufall: Sections and model

These aims are to be achieved while guaranteeing a separating and physically substantiated threshold between the two programmes. Applying Forty's categories for flexibility, the envisioned spatial structure fits into the category *Flexibility by technical means*. Technically driven architecture normally applies one- or two-dimensional spatial changes. Exceptions are the so-called event architectures, promotional structures which are sometimes 3-dimensionally expanding structures, for example Rem Koolhaas' Prada Transformer or the spheres by Chuck Hoberman. Here I will investigate whether a 3-dimensionally mutating special configuration is desirable for the defined purpose.

5.2 ZUFALL

The initial seed of this research project lies in a project that I developed in 1997. As the starting point of the design process I introduce the *Zufall* model.

Zufall is a German word meaning chance, or coincidence. The project intends to illustrate unpredictability in a design process: a box made of flexible and transparent acrylic glass is being filled up with inflated air balloons. The degree of air charge can vary from lightly to strongly filled. The six surfaces constituting the box are connected at its eight corners; the edges of the surfaces are loose. The box represents a building envelope; the balloons represent single rooms within the building. The model illustrates a system of distribution of space. Two stages can be observed: firstly, the box is filled with balloons until the volume of the box is distributed amongst the balloons. In stage two, the box is being filled beyond the spatial limits of the box. It expands and mutates to a spherical shape in reaction to the increased spatial demand of the balloons. The volumes of the balloons now entirely fill up the envelope structure leaving almost no leftover space. The surfaces of the balloons squash against each other.

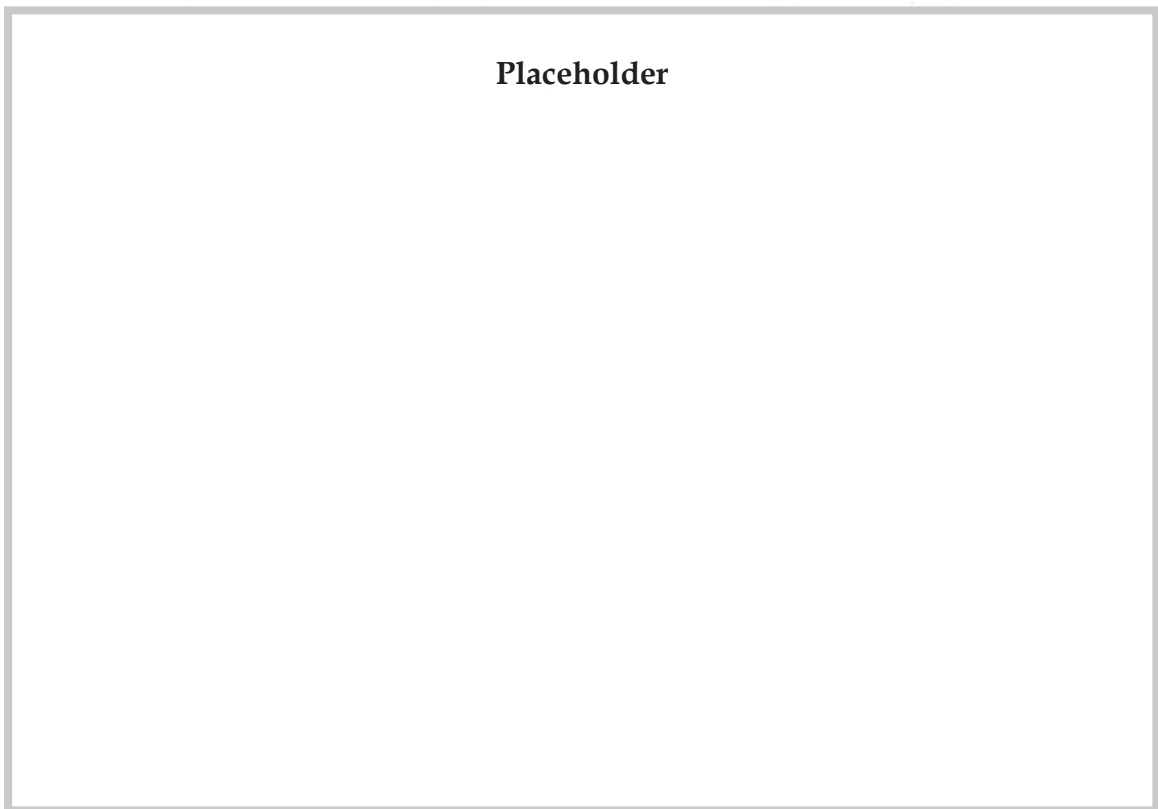
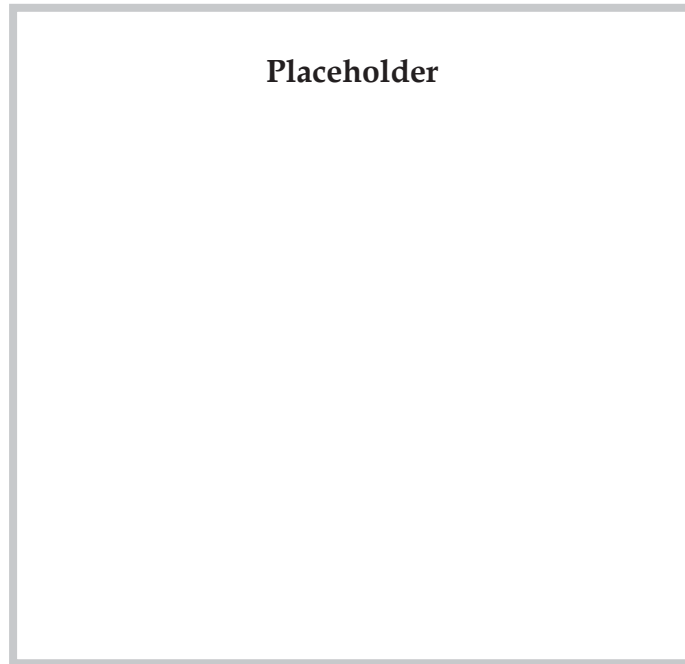


Fig.17
P. Virilio & C. Parent, *Le Potentialisme*, 1966. Sketch.
Topotonique, concept 1966. Drawing.

The conclusions relevant for the geometrical exercises are:

- The filling condition of each single entity has an impact on the spatial distribution for every other participant in the system.
- The spatial equilibrium amongst all balloons changes with every change in every single balloon.

For the aspired building typology these qualities seem to be desirable, since redundant spatial volume can be distributed not only to a direct neighbour but to all participants in the system.

The balloon model does not distinguish between different kinds of programmes of the single spatial entities. Therefore the first step of the design process intends to find spatial arrangements that distinguish between at least two different programmes to use two different spatial entities.

5.3 INTERWOVEN PATHS AND ORTHOGONAL INTERPENETRATION MODELS

My first geometrical tests, in the current research, were driven by the idea of the maximisation of direct neighbourhood to a complementary programme. With this arrangement I expected to reduce the movements of thresholds and to keep the level of elasticity low for imagined materials. The paper-stripe models represent an interwoven system of access paths. The rooms would settle along these paths. A similar geometrical configuration has already been proposed by Paul Virilio and Claude Parent for their *topotoniques*² (though in an urban scale). In the next step I attempted to span membranes between the paths. The expected interwoven duality has not been achieved. Foreign paths permeated the membranes.

Geometrical solutions for the industry where maximum temperature exchange is intended, like radiator structures (see ill. p. 76), inspired the

² Paul Virilio, Claude Parent and Bernd Wilczek, *Architecture principe: 1966 and 1996* ([Besançon]: Les Ed. de l'Imprimeur, 2000). *Architecture Principe 6: LA CITÉ MÉDIATE*, p. 10

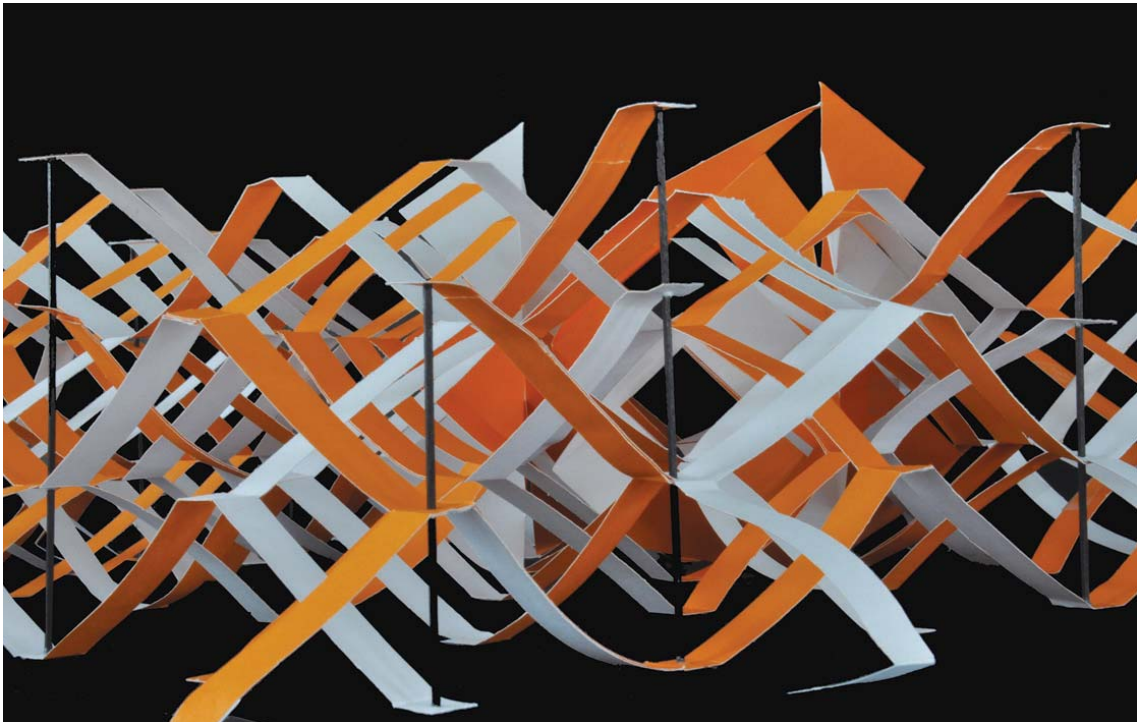
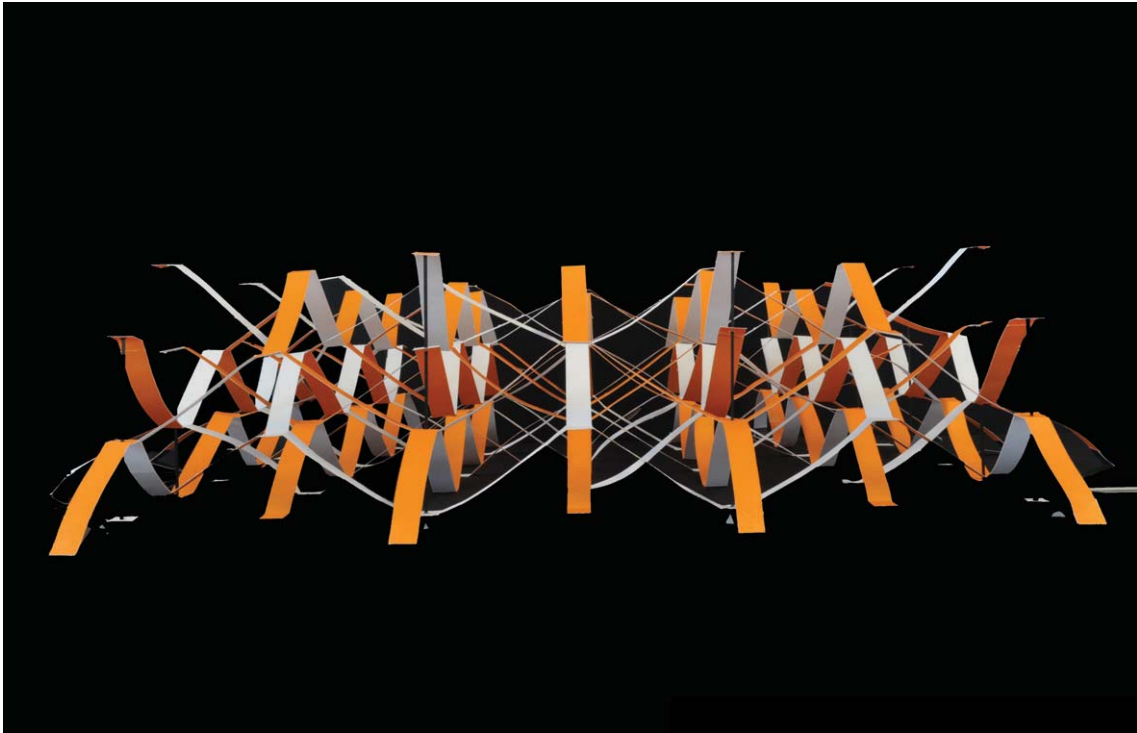
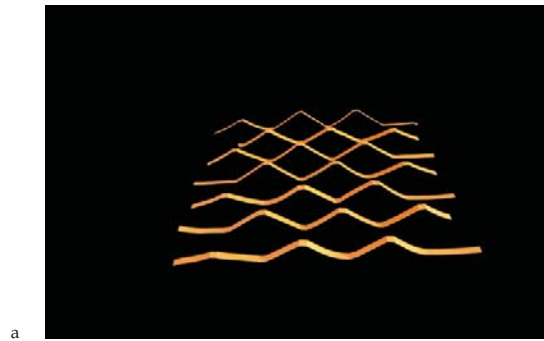
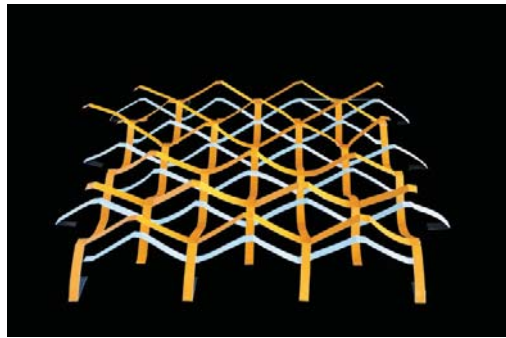


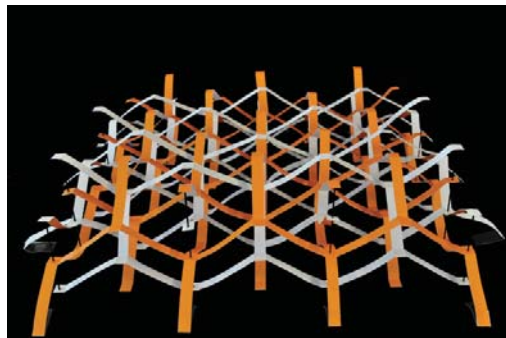
Fig.18
Elastic Architecture Series: Interwoven paths II



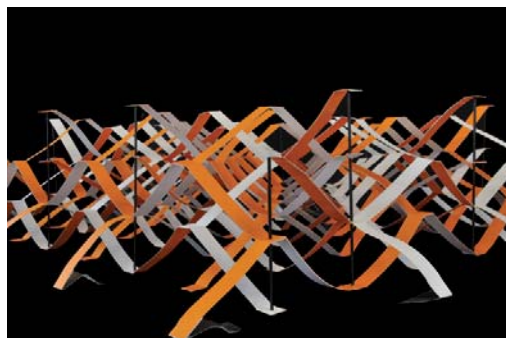
a



b



c



d

Fig.19
Elastic Architecture Series: Interwoven paths II, process

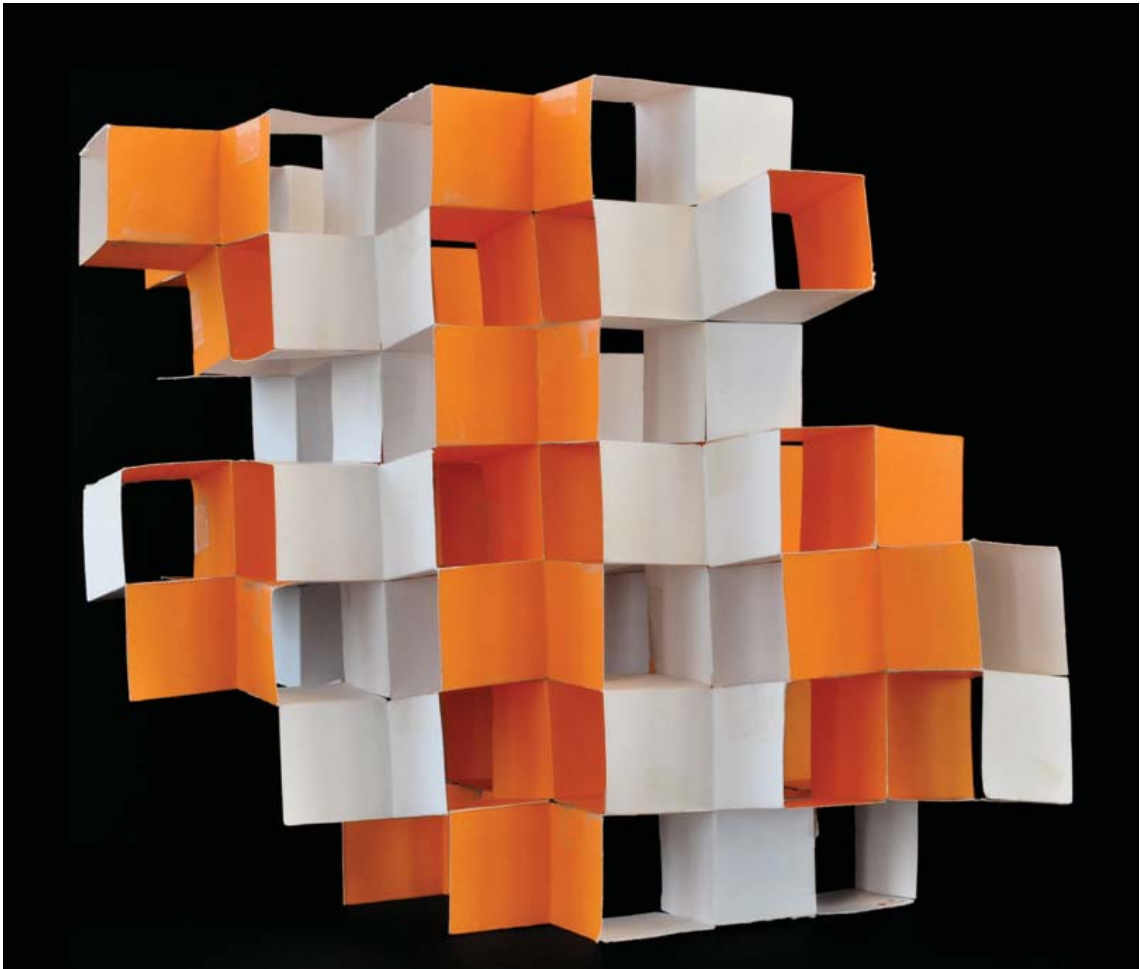
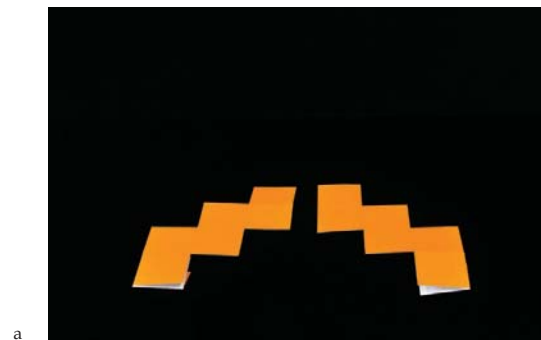
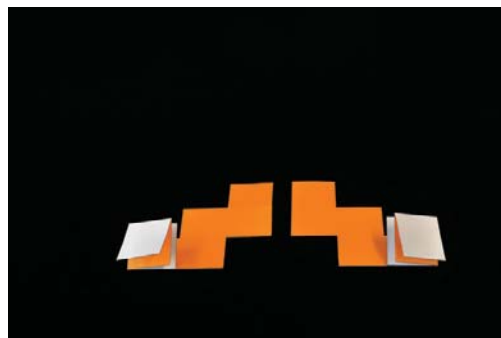


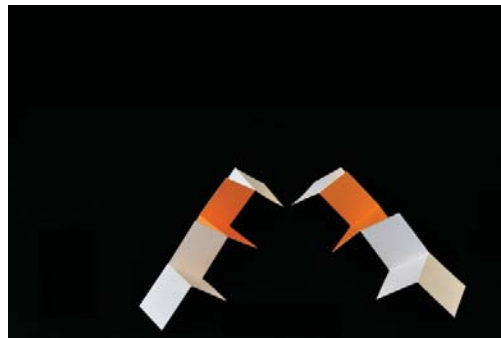
Fig.20
Elastic Architecture Series: Orthogonal interpenetration II



a



b



c



d

Fig.21
Elastic Architecture Series: Orthogonal interpenetration II, process

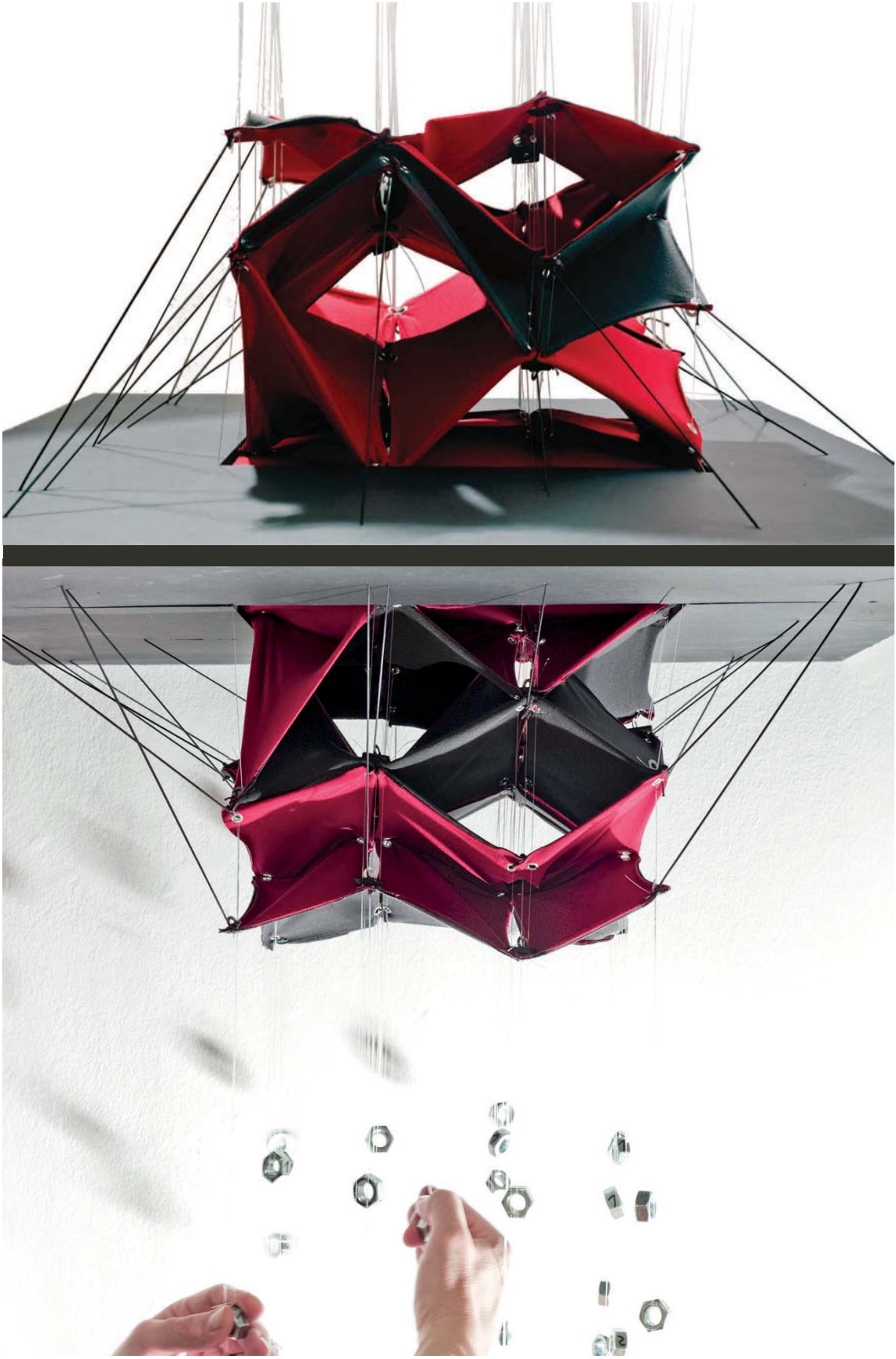


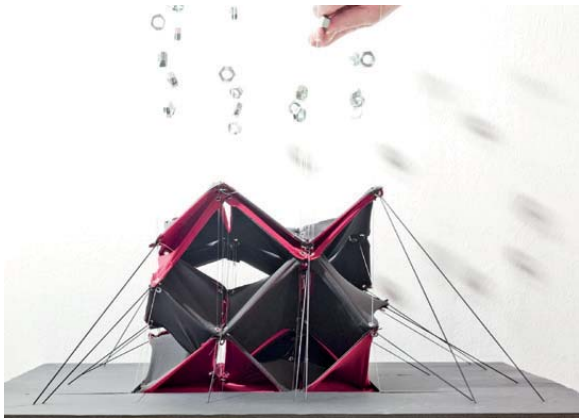
Fig.22
Elastic Architecture Series: Interactive elastic model



a



b



c



d



a



b



c



d

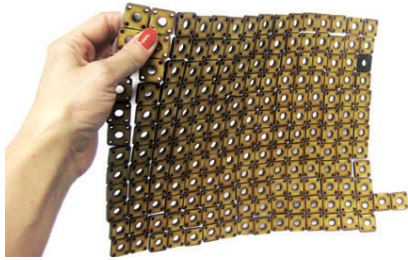
Fig.23
Elastic Architecture Series: Interactive elastic model: Mutation by actuation (nylon strings)



a



b



c



d



e



f



g



h

Fig.24
Elastic Architecture Series: Interactive elastic model, process

research as well. I managed to build a system of possibly infinitely interpenetrating spaces in a straight and orthogonal way. Philip Ball describes these as a bicontinuous structure of shapes that divides up the space into two interpenetrating regions³.

Toyo Ito's proposal for the Taichung Metropolitan Opera (see ill. p. 76) applies a similar geometrical configuration. The geometry can be put together by symmetrically arranging, folding and connecting stair-shaped stripes.

5.4 INTERACTIVE ELASTIC MODEL

In order to introduce time as the fourth dimension of flexible architecture I used this geometry for an interactive physical model. The material chosen is bi-elastic textile normally used for swimsuits. Each corner junction is set as an actuation point and can be manipulated individually by pulling nylon strings. I could observe that the system was complex to operate, and did not provide significant new information. However, it was playful and consequential and started to develop an aesthetics of elasticity.

5.5 DIGITAL MODELLING

To take the research to the next step, I started computer simulations of the intended geometrical configurations. Returning to the interwoven paths, I observed that they are arranged in parallel in a rectangular grid of double helix spirals with alternating spiral directions (clockwise and counter clockwise). The double helix system as an architectural element has already been introduced in a staircase in the French renaissance castle Chateau Chambord (1519-1547)⁴ (see ill. p. 77). Aiming for a generative geometrical

³ Philip Ball, *Nature's Patterns: A Tapestry in Three Parts* (Oxford; New York: Oxford University Press, 2011), p. 89.

⁴ Pierre Gascar, *Chambord* (C.J.Bucher, 1965), p. 30.

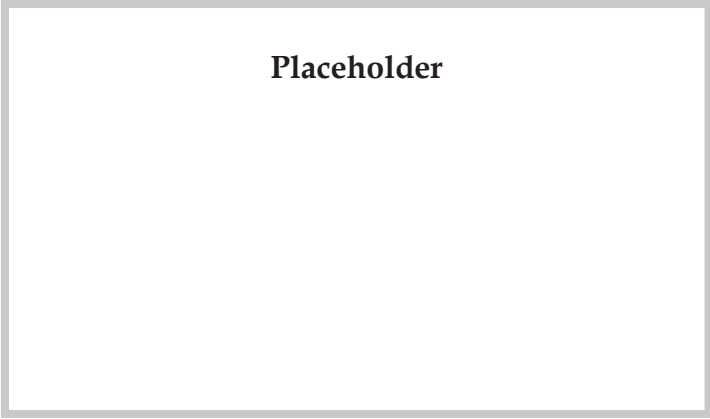
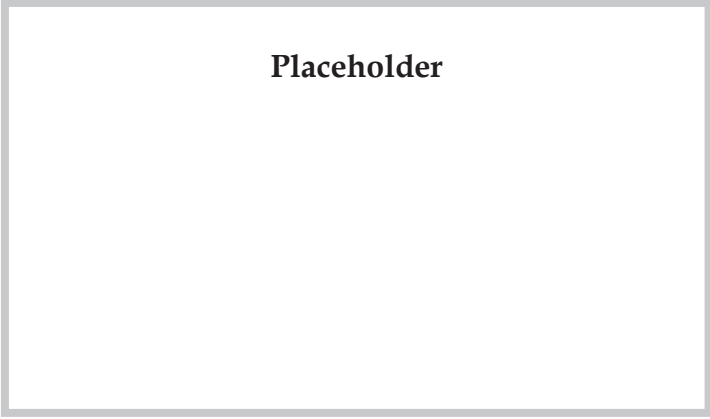


Fig.25
Top: Taichung Metropolitan Opera, Taiwan, Toyo Ito, 2014
Bottom: Radiator (geomerty aiming for maximised temperature exchange)

Placeholder

Fig.26
Chateau Chambord, Chambord, France 1519-1547
Top left: Ground floor plan
Top right: Ground floor plan in detail
Bottom left: Intersection of the stair
Bottom right: Staircase 1st floor, at the level of the armory

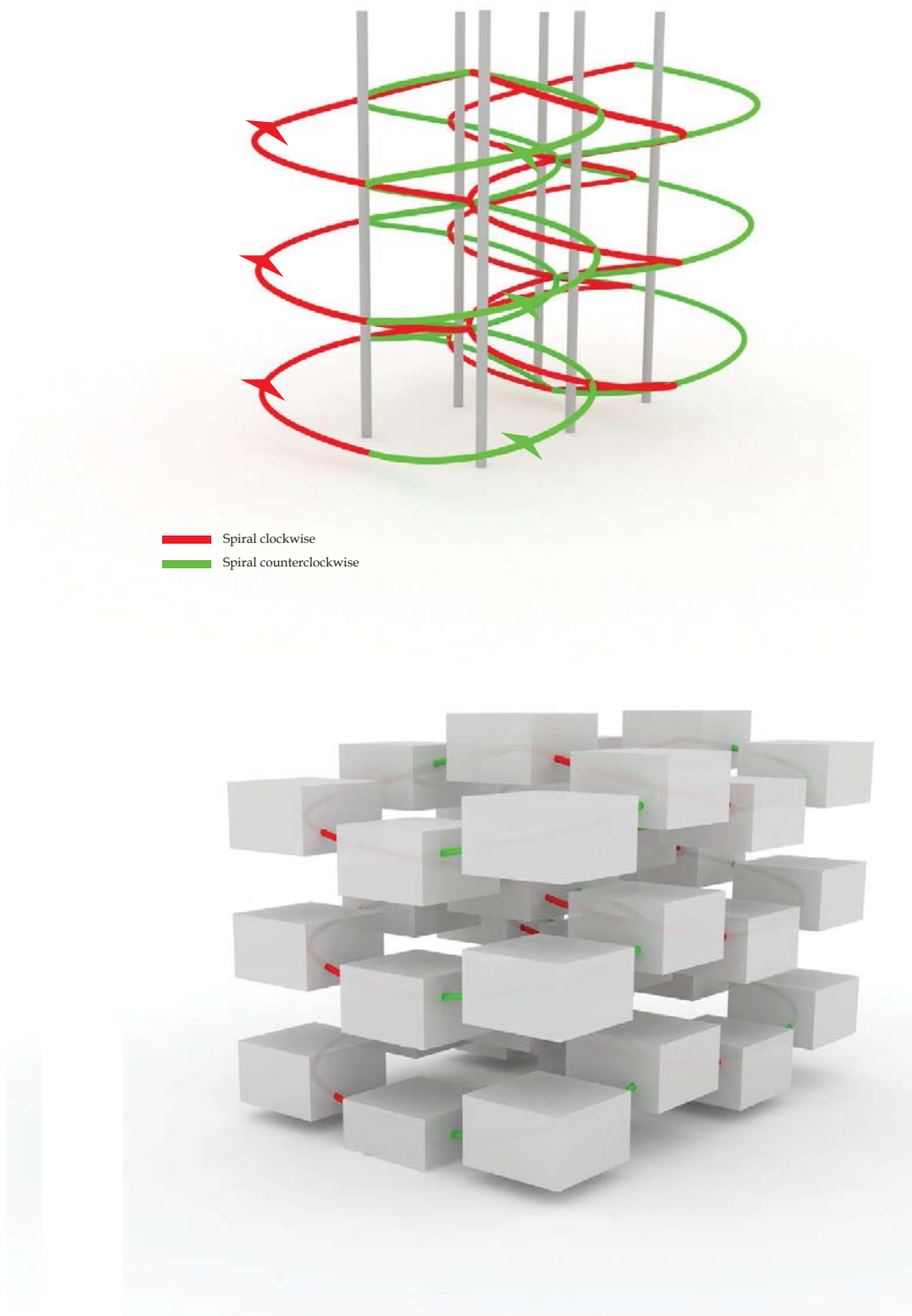


Fig.27
Elastic Architecture Series: Construction principle for the Grasshopper script (1)

structure I used the algorithmic modelling tool Grasshopper, a plugin for the CAD program Rhinoceros 3D.

The interwoven paths paper model was rebuilt by placing cuboids along the spirals at every 1/4-rotation. The top and bottom surfaces of the cuboids constitute the direction-changing horizontal squares which are connected by the path. The usage of the top and the bottom of the cuboid creates a two-layered spiral, resulting in a double helix configuration. Hyperbolic parabolic surfaces are spanned between the inclining edges of the ramps. This is done in such a way that the horizontal mirrored (mirror axis is the axis of the initial spiral) ramps are always connected. The grasshopper script allows (amongst others) for dynamic values of:

- grid sizes values x and y
- height of one spiral turn
- cuboid sizes x, y and z

The resulting geometry is a bicontinuous structure.

By changing values for cuboid- and grid-sizes, the shape changes gradually from the rigid style of the orthogonal initial paper model to a very soft appearance. However, all results are bicontinuous structures that divide up the space into two interpenetrating regions.

I speculate that these two divided regions are used by the two programmes: dwelling and administration office (as identified in the earlier study). I assigned these to either side of the infinite surface. The office is on the side of the constituting cuboids, the dwelling on the other side.

Space is organised according to the degree of utilisation. This happens through the change of the size of the cuboids.

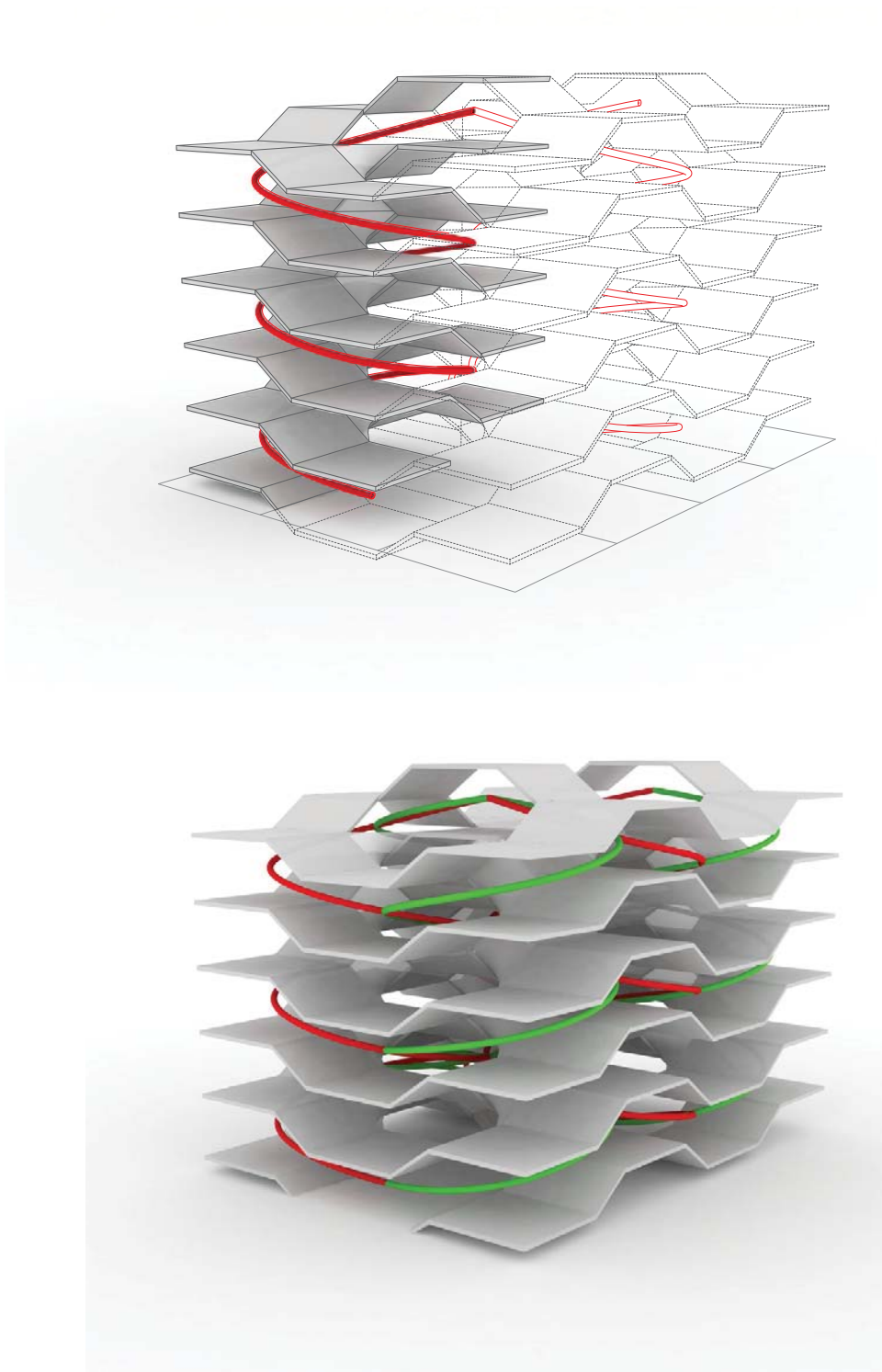


Fig.28
Elastic Architecture Series: Construction principle for the Grasshopper script (2)

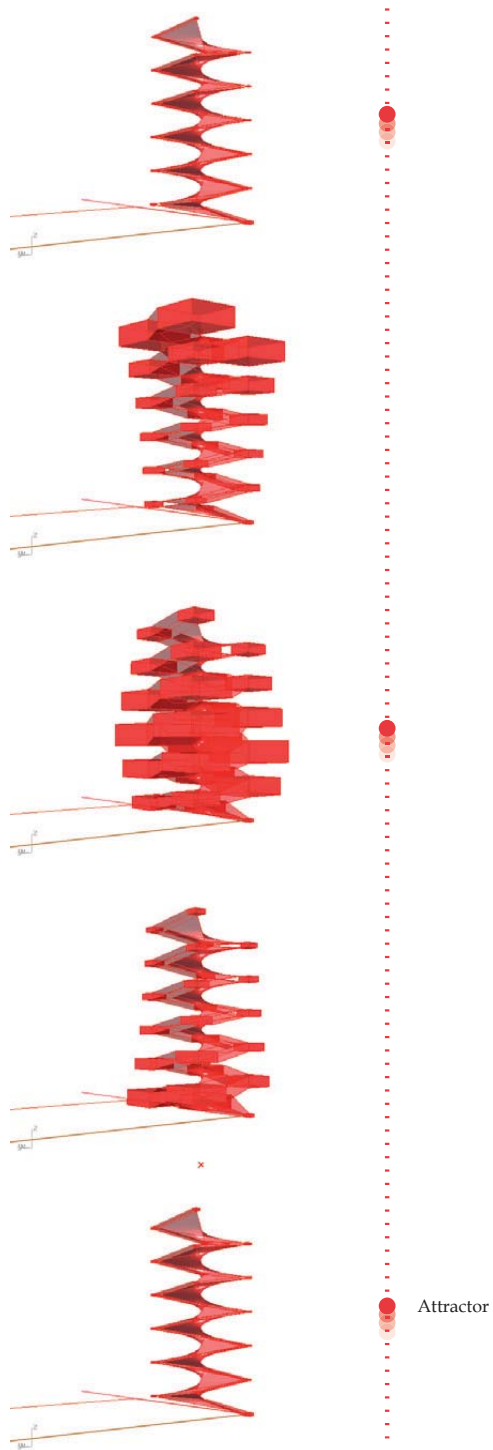


Fig.29
 Elastic Architecture Series:
 Digital parametric model: Animation of reactive behaviour: Cuboids' growth and shrinkage

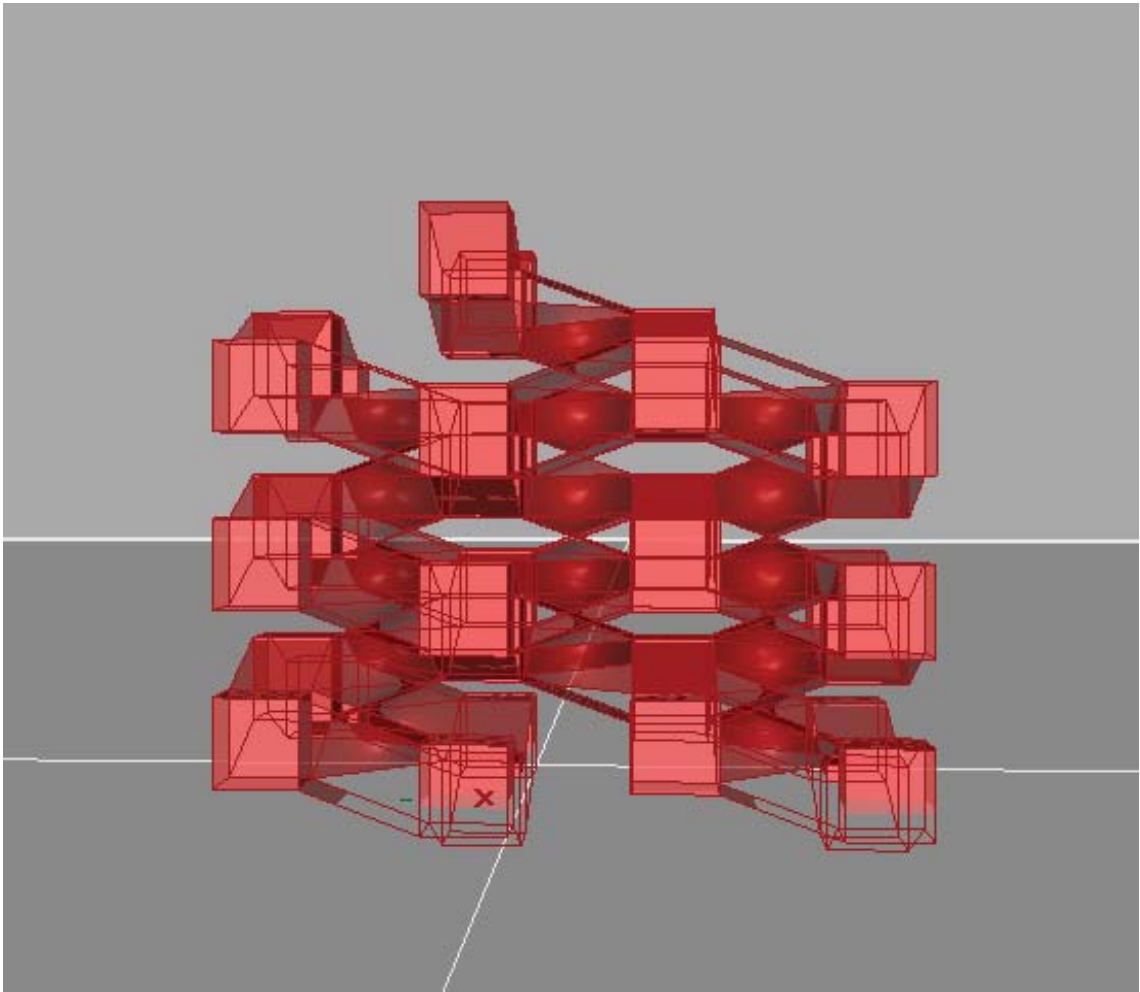


Fig.30
Elastic Architecture Series: Digital parametric model: Simulation #1

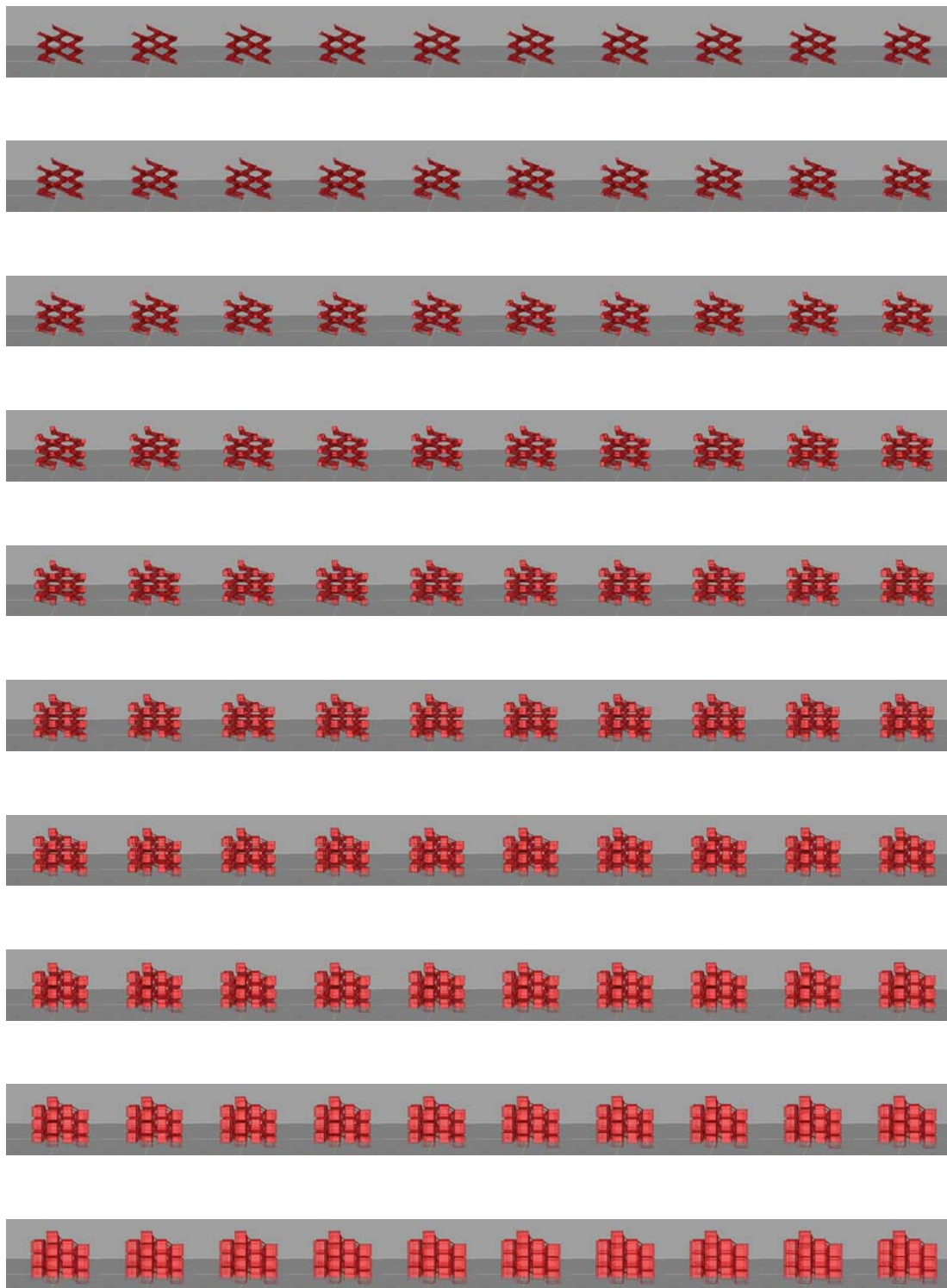


Fig.31
Elastic Architecture Series: Digital parametric model: Simulation #1

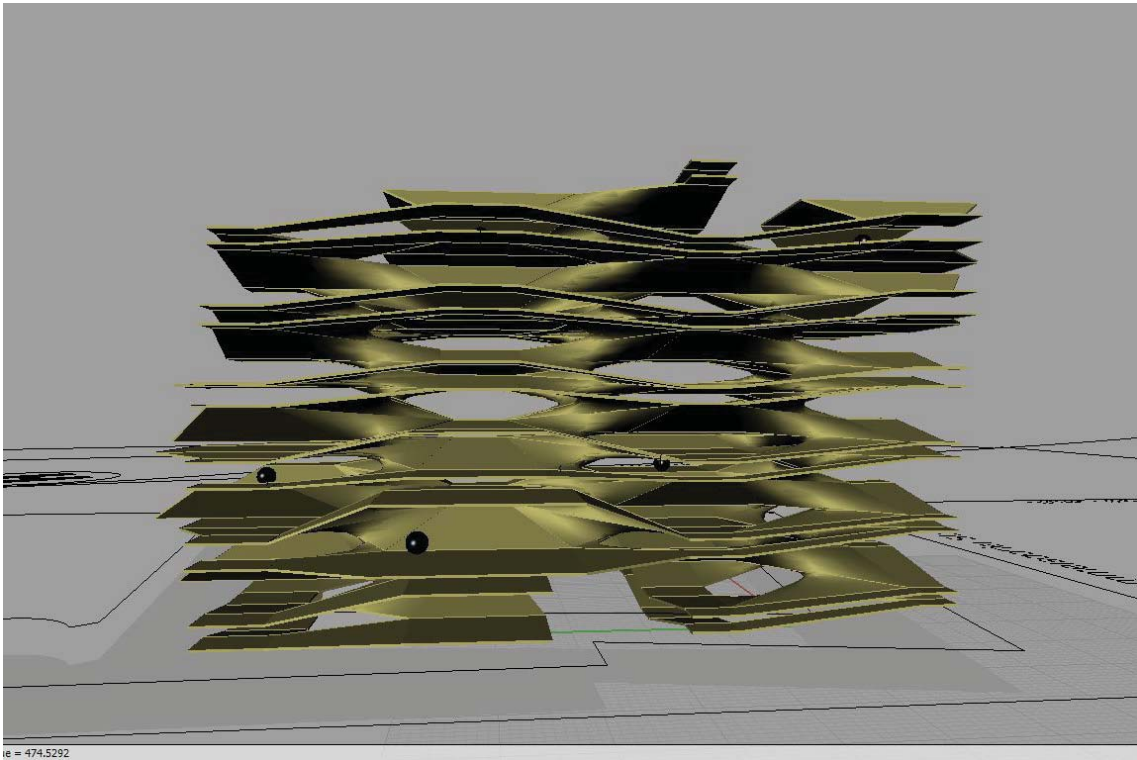


Fig.32
Elastic Architecture Series: Digital parametric model: Simulation #2 (running dog)



Fig.33
Elastic Architecture Series: Digital parametric model: Simulation #2 (running dog)

5.6 SIMULATION 1

As part of the simulation process, I changed the size of the cuboids according to an imagined oscillation of uses between the two. One region shrank while the other region grew. The changes resulted in an either very rigid, box-style appearance when offices were intensively used or a very soft style when the structure appeared like a continuously rotating soft landscape. This is the behaviour with rigidly synchronized patterns of use of all participants.

5.7 SIMULATION 2

Another simulation is based on the actuation by single actuators called *running dogs* (see ill. p. 84f). The *running dogs*, each represented by a black ball, increase, by appropriation, the size of the single cuboids. The spatial impact on the whole structure can be described as considerable, resulting in an almost dancing building, and with a strong impact on all (more than one) neighbouring units.

The simulation revealed the quandary of the 3-dimensionally expanding cuboids: shrinking cuboids should lead to growing spaces between them. This also let the entire structure grow. When cuboids shrank, their ceiling also shrank in size which then resulted in reducing the floor of the complementing programme (which was not intended).

5.8 SIMULATION 3

In the third simulation the cuboids were not space-defining anymore but split into bottom and ceiling with the complementary programmes assigned to them (see ill. p. 94f). Growth and shrinkage now only applied along the z-axis. The dwelling utilisation survey from an earlier chapter was used as data source, complemented with office-data. (The data-sourcing will be explained in depth in the Case Studies: Tracks and Curtain chapter). The

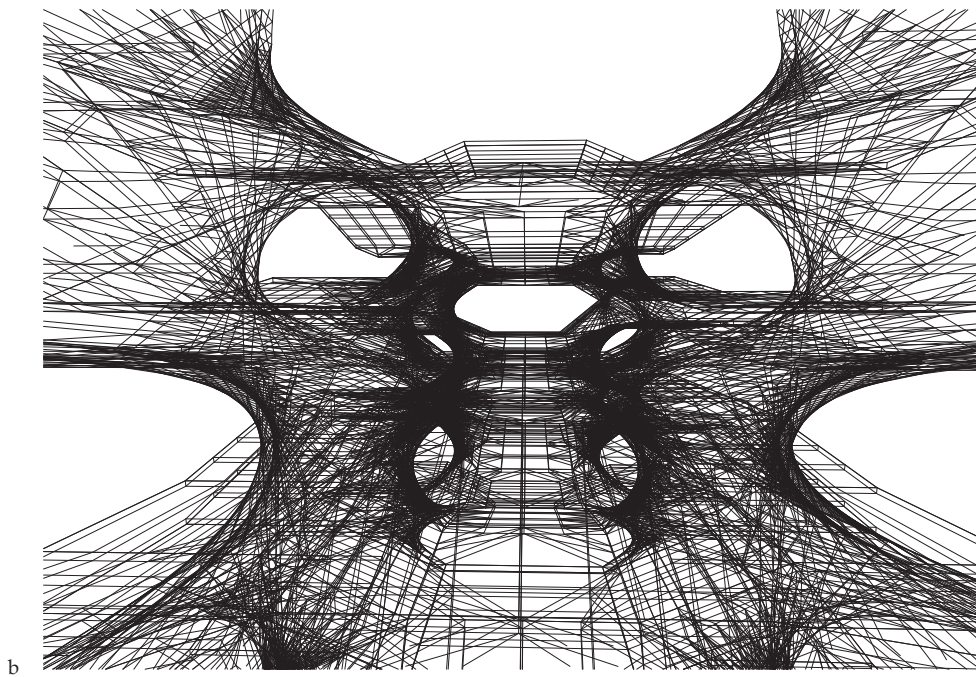
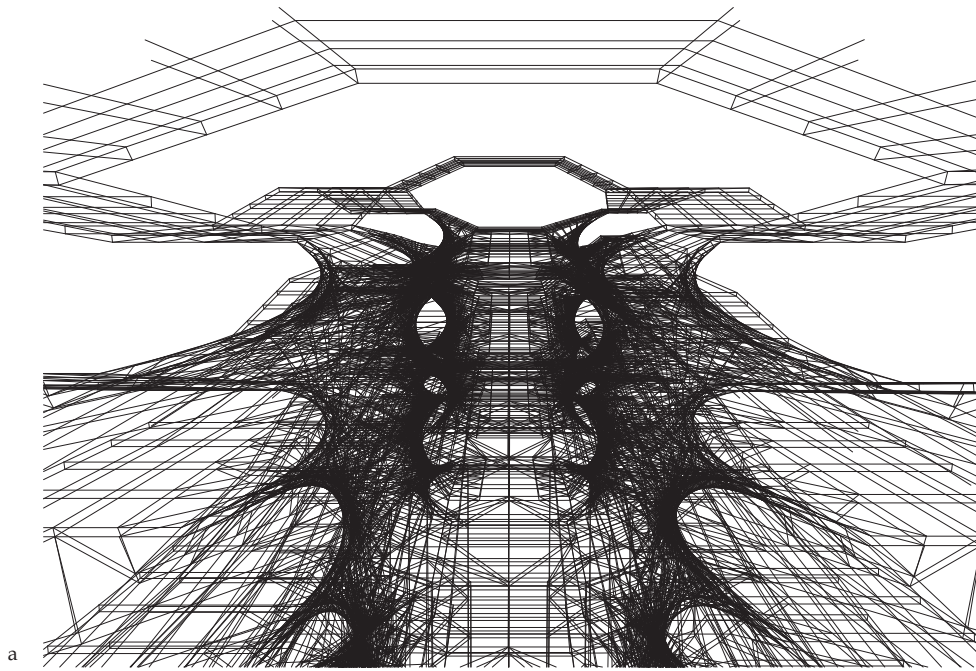


Fig.34
Elastic Architecture Series: Digital parametric model: Simulation #3, wireframe

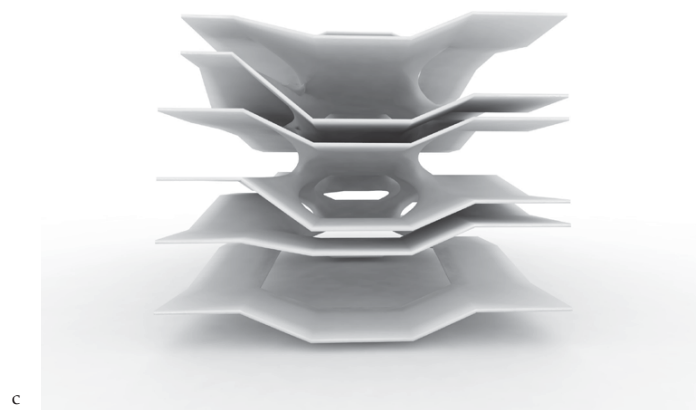
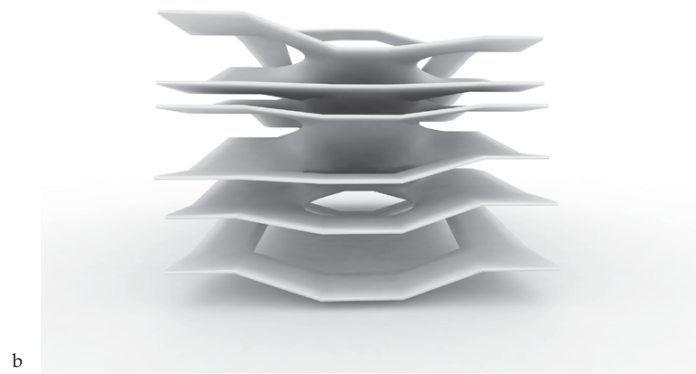
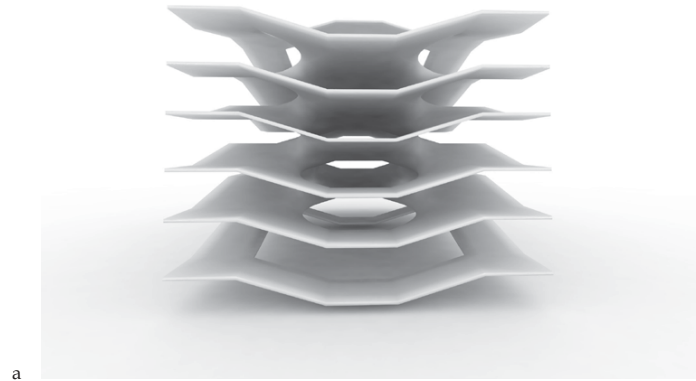
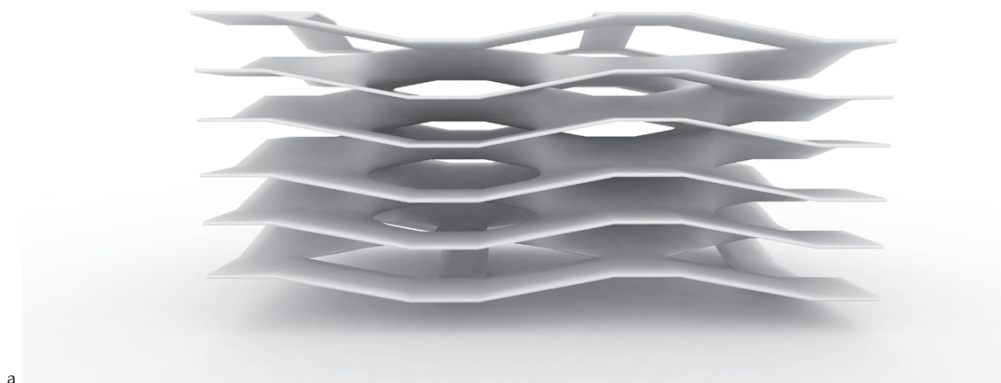
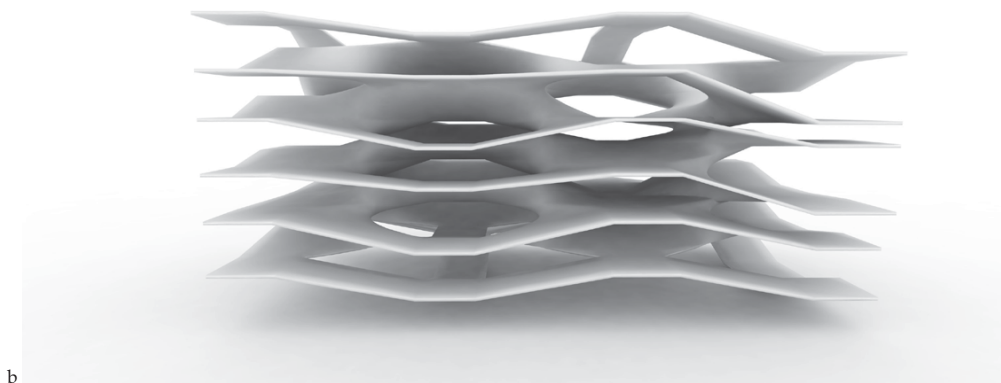


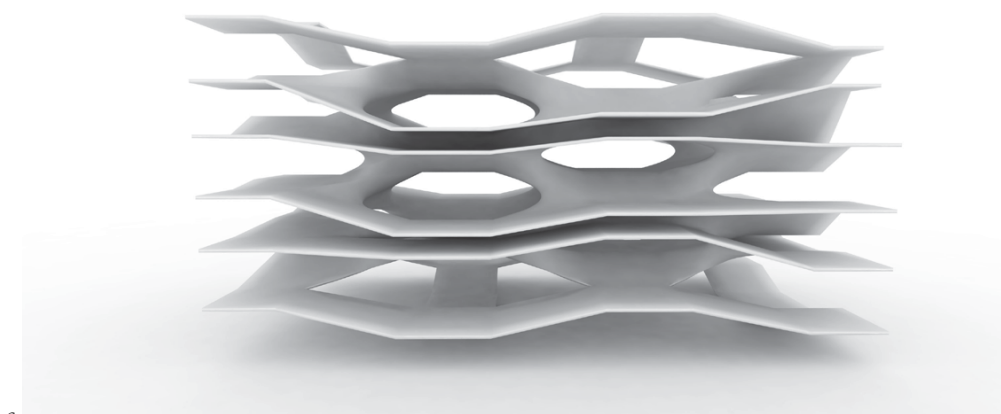
Fig.35
Elastic Architecture Series: Digital parametric model: Simulation #3



a

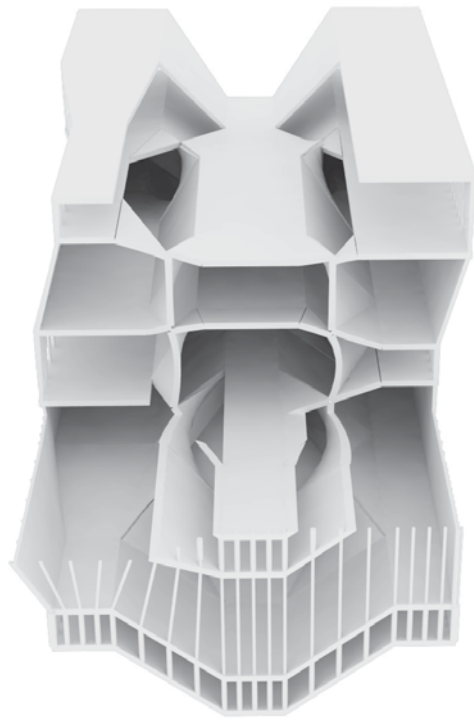


b



c

Fig.36
Elastic Architecture Series: Digital parametric model: Simulation #3



compare straight settings (2x2 equal levels in a set of 4)

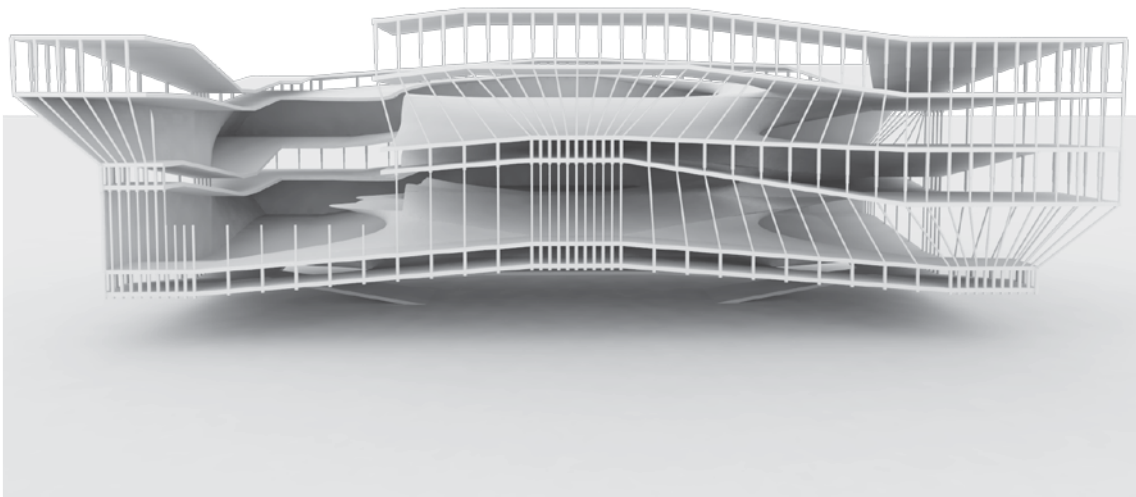
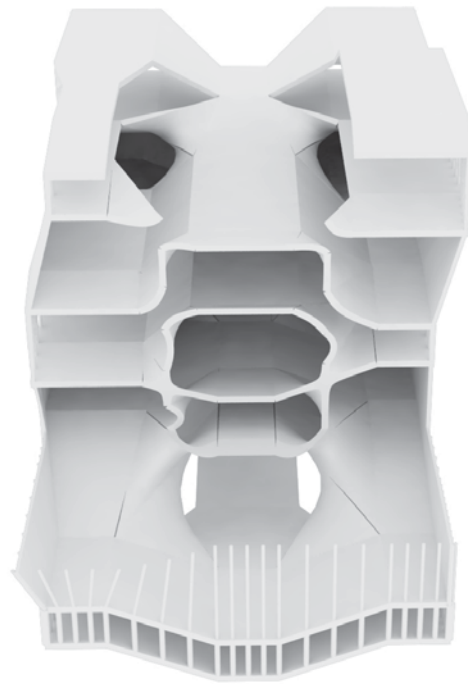


Fig.37
Elastic Architecture Series: Digital parametric model: Tectonic approximation #1



and bendy settings (4 different levels in a set of 4)

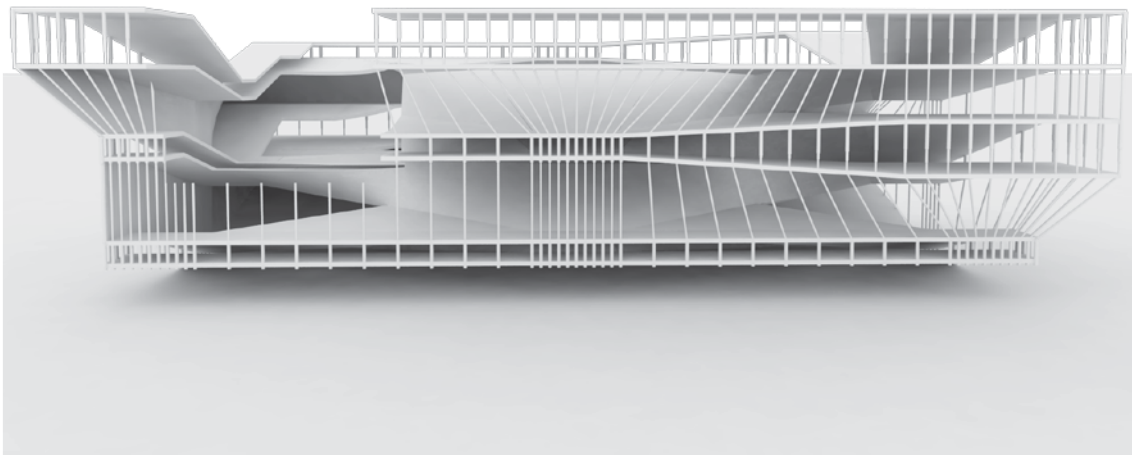


Fig.38
Elastic Architecture Series: Digital parametric model: Tectonic approximation #2

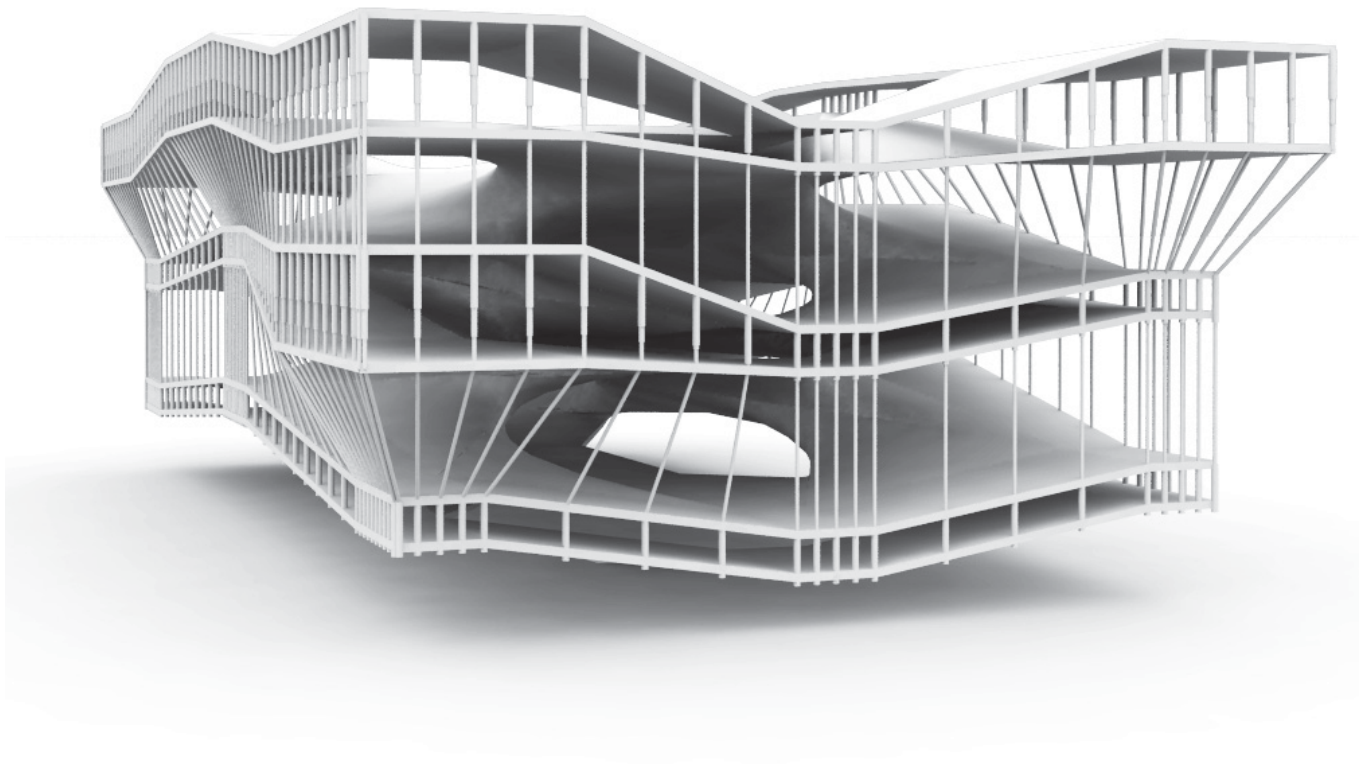


Fig.39
Elastic Architecture Series: Digital parametric model: Tectonic approximation #3

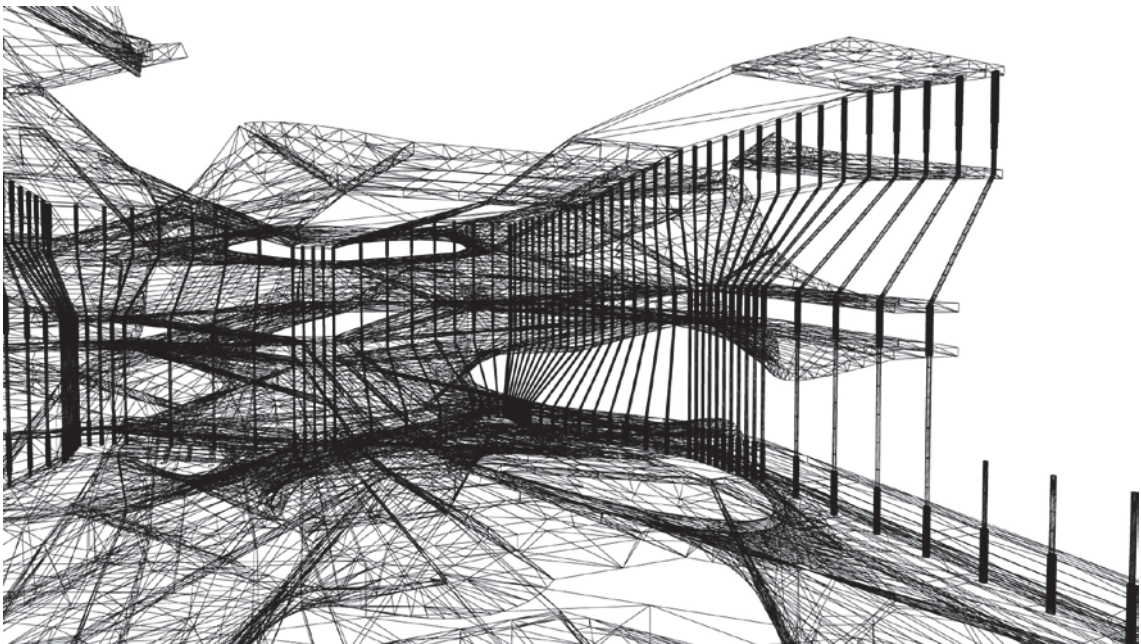
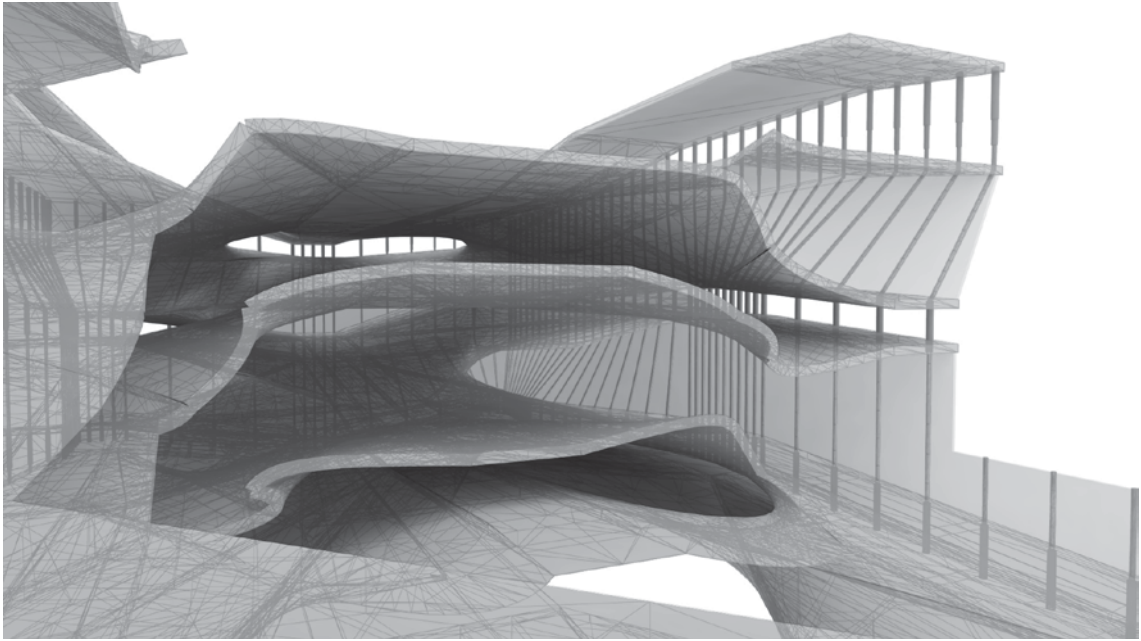
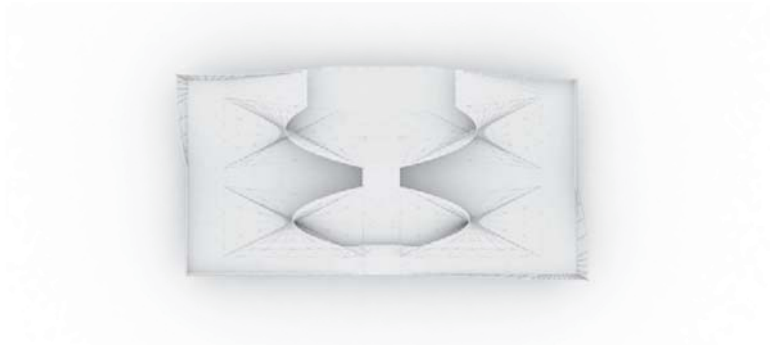
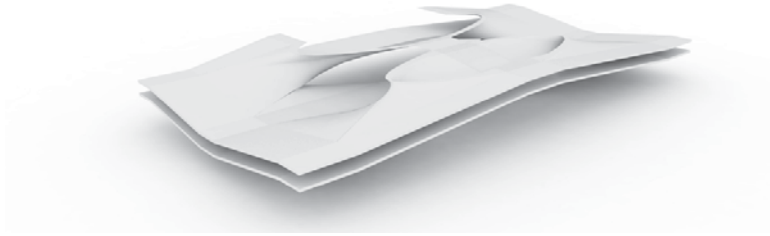


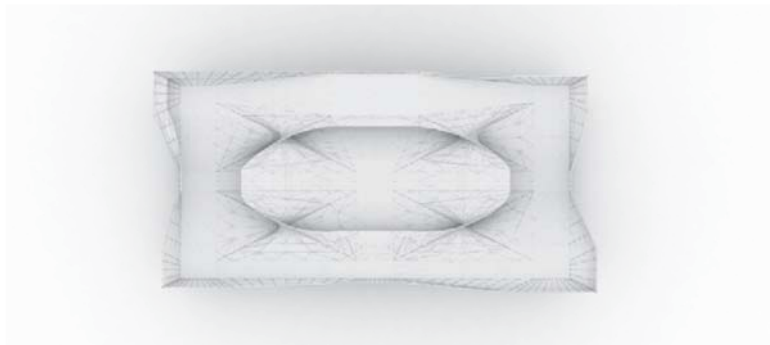
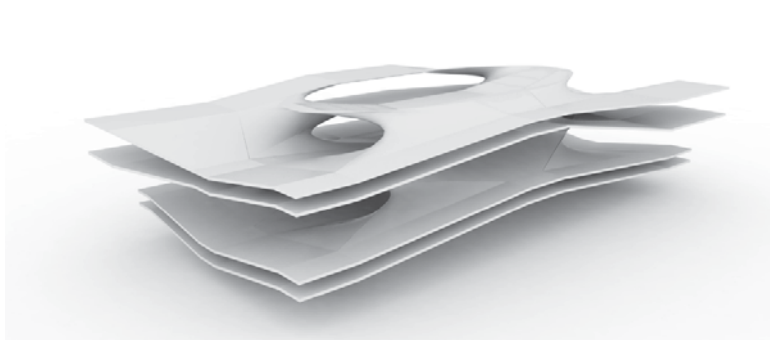
Fig.40
Elastic Architecture Series: Digital parametric model: Tectonic approximation #3, perspective and section

a



6.0 Level of Cut Plane (Floorplan Level) [m]
20 Offices Occupied (Boxes)
7 Officespaces Vacant (Boxes)
10 Flats Occupied (Spheres)
17 Flats Vacant (Spheres)
12.0 Unit length (X) in balanced mode [m]
6.0 Unit width (Y) in balanced mode [m]
3.0 Unit height (Z) in balanced mode [m]
60 Length (X) overall [m]
30 Width (Y) overall [m]
20 Height (Z) overall [m]

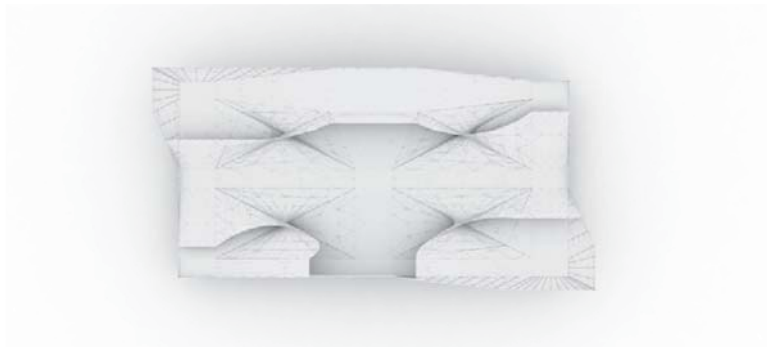
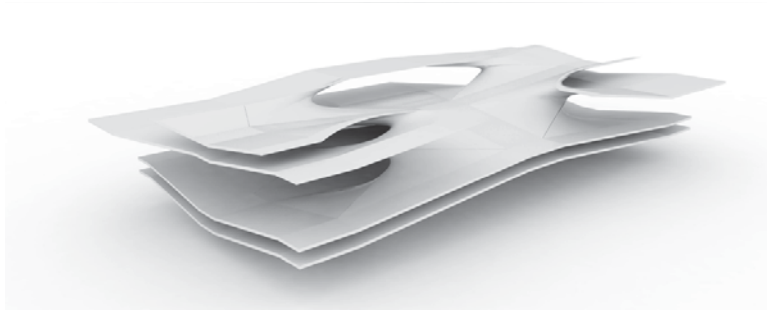
b



13.0 Level of Cut Plane (Floorplan Level) [m]
20 Offices Occupied (Boxes)
7 Officespaces Vacant (Boxes)
10 Flats Occupied (Spheres)
17 Flats Vacant (Spheres)
12.0 Unit length (X) in balanced mode [m]
6.0 Unit width (Y) in balanced mode [m]
3.0 Unit height (Z) in balanced mode [m]
60 Length (X) overall [m]
30 Width (Y) overall [m]
20 Height (Z) overall [m]

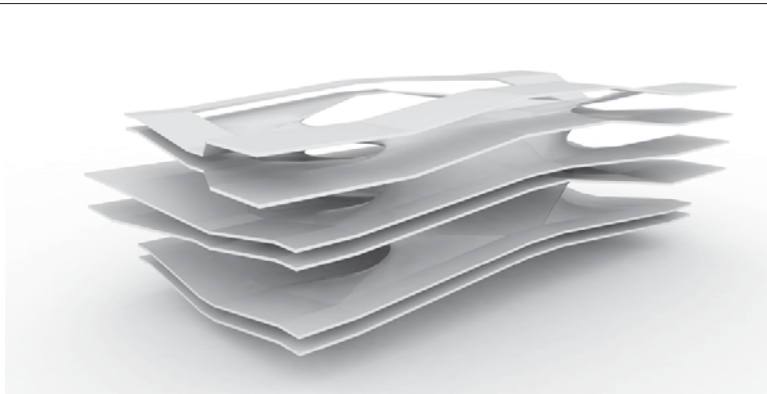
Fig.41
Elastic Architecture Series: Digital parametric model: Tectonic approximation #4

c



10.0	Level of Cut Plane (Floorplan Level) [m]
20	Offices Occupied (Boxes)
7	Officespaces Vacant (Boxes)
10	Flats Occupied (Spheres)
17	Flats Vacant (Spheres)
12.0	Unit length (X) in balanced mode [m]
6.0	Unit width (Y) in balanced mode [m]
3.0	Unit height (Z) in balanced mode [m]
60	Length (X) overall [m]
30	Width (Y) overall [m]
20	Height (Z) overall [m]

d



50.0	Level of Cut Plane (Floorplan Level) [m]
20	Offices Occupied (Boxes)
7	Officespaces Vacant (Boxes)
10	Flats Occupied (Spheres)
17	Flats Vacant (Spheres)
12.0	Unit length (X) in balanced mode [m]
6.0	Unit width (Y) in balanced mode [m]
3.0	Unit height (Z) in balanced mode [m]
60	Length (X) overall [m]
30	Width (Y) overall [m]
20	Height (Z) overall [m]

Fig.42
Elastic Architecture Series: Digital parametric model: Tectonic approximation #4

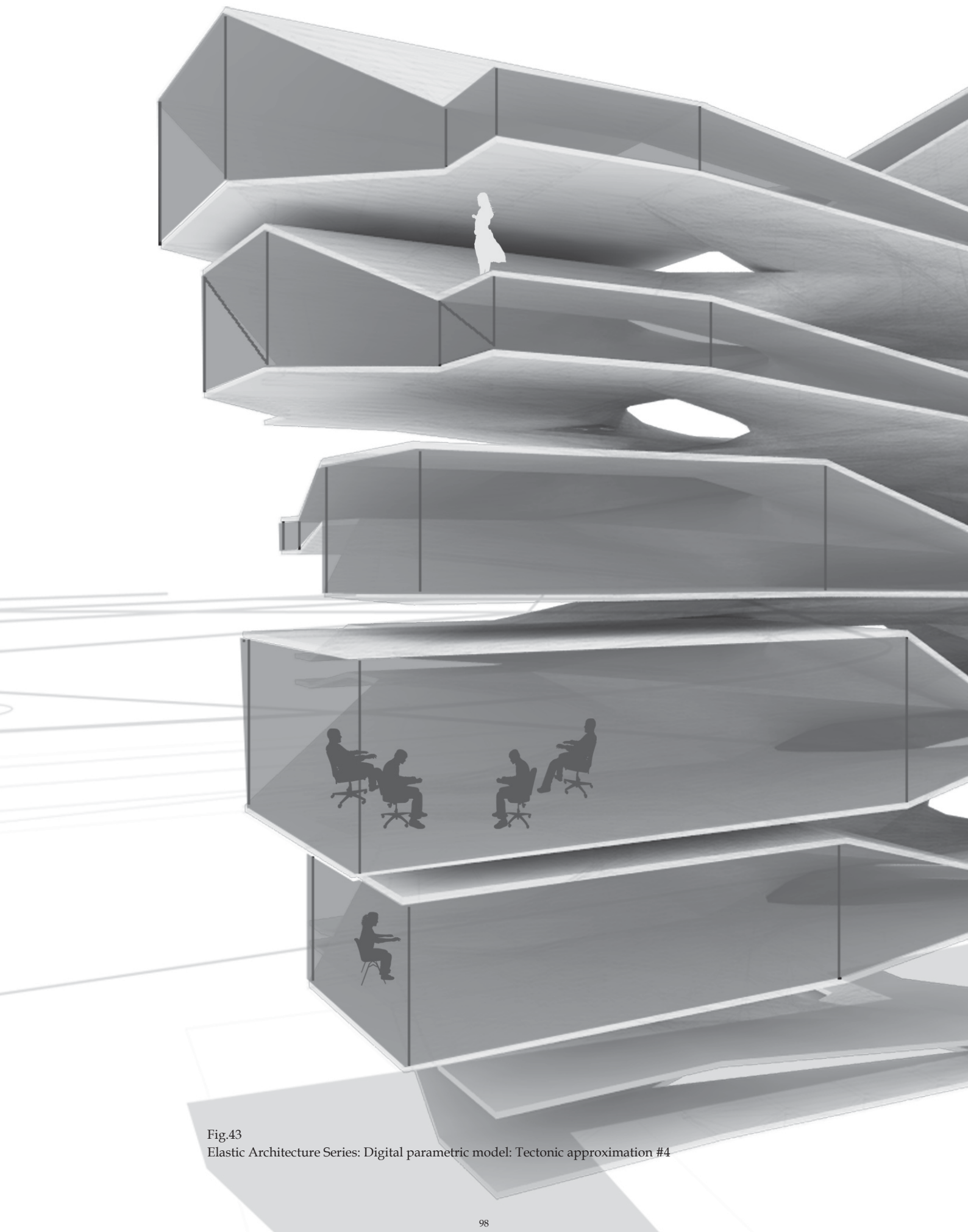
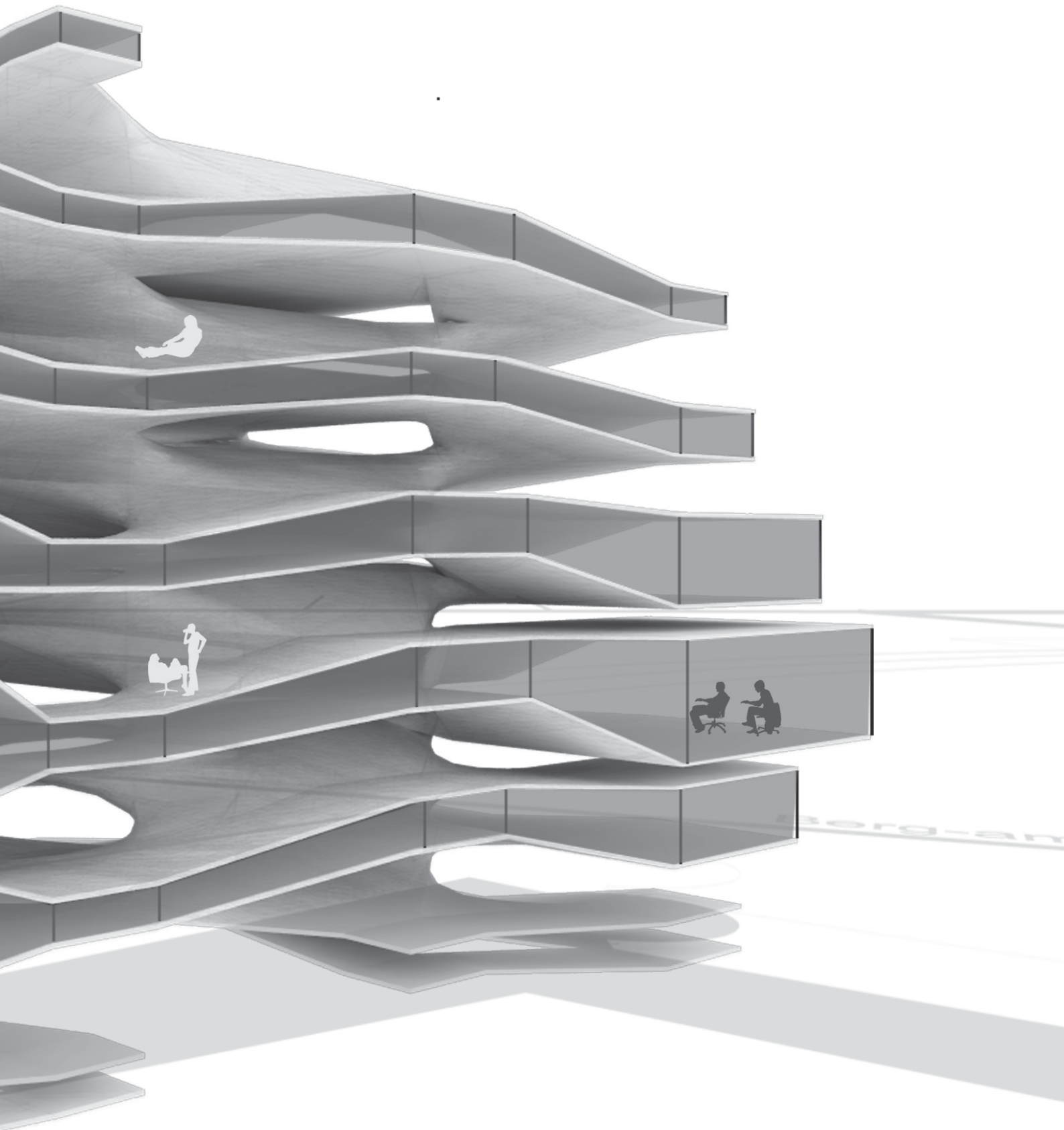


Fig.43
Elastic Architecture Series: Digital parametric model: Tectonic approximation #4



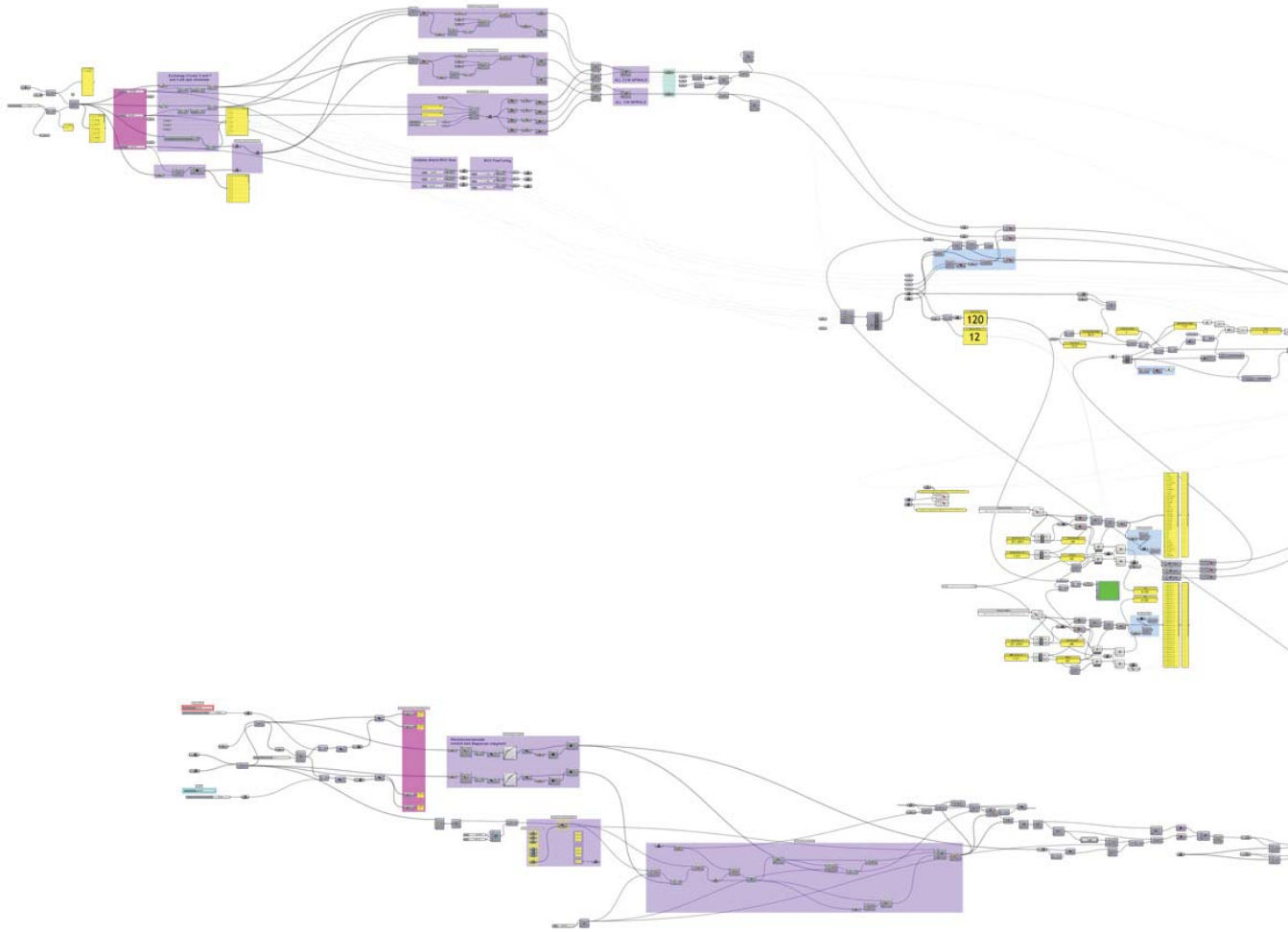
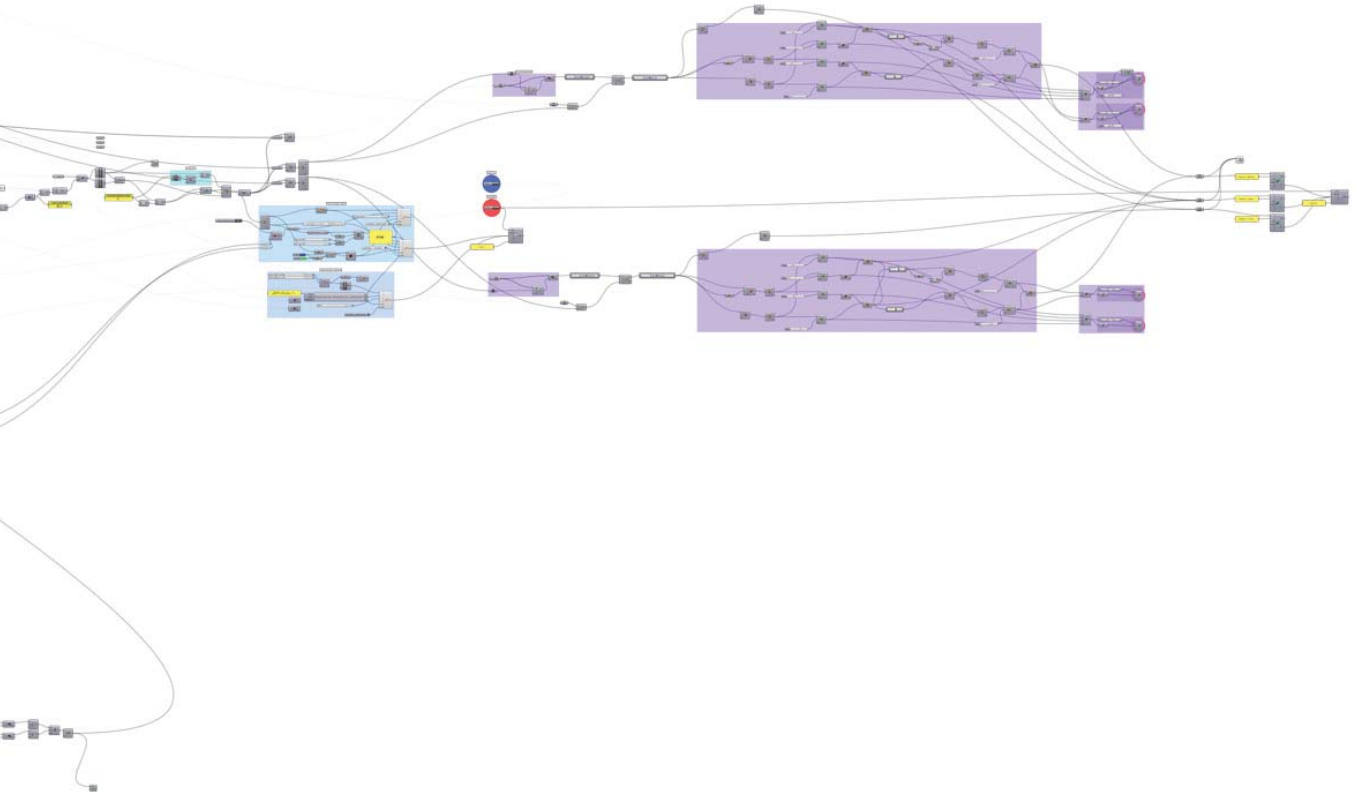


Fig.44
Elastic Architecture Project: Grasshopper script



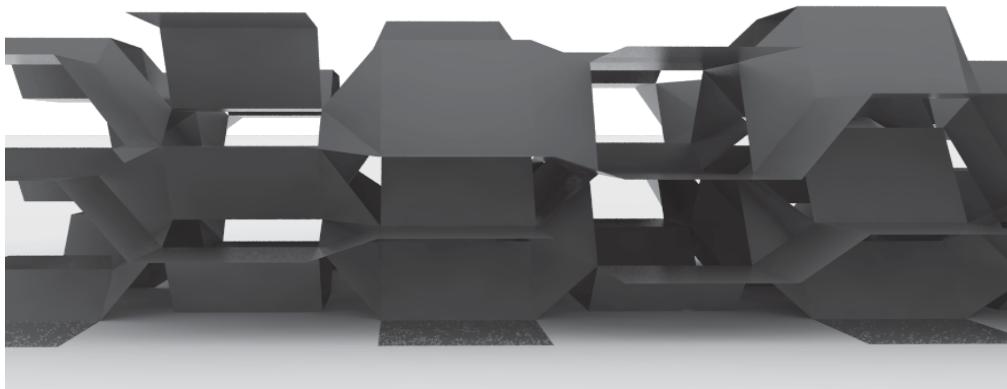
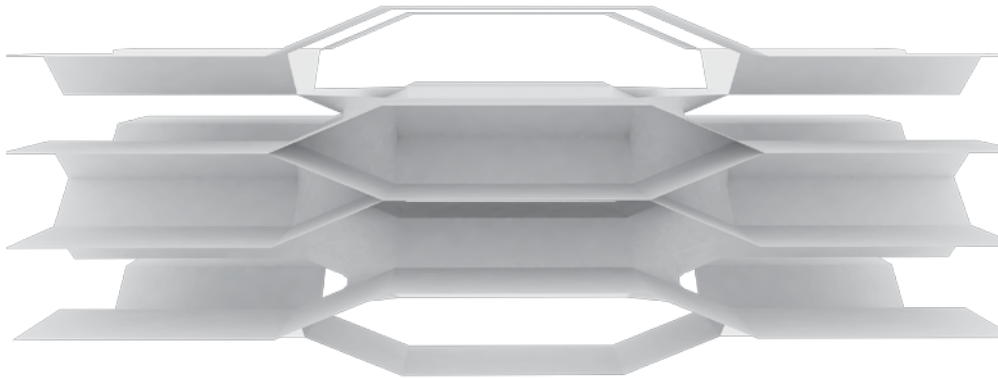


Fig.45
Elastic Architecture Series: Digital parametric model, configurations #1, #2 and #3

result of the simulation was strongly deformed spatial structures, seemingly not capable of being used as a functioning building.

5.9 CONFIGURATIONS AND TECTONIC APPROXIMATIONS

I carried out a number of further design experiments. These are based on the identical grasshopper script. Configurations (see ill. p. 87) study spatial connections and relations whereas the tectonic approximations intend to bring the spatial speculations to an architectural scale.

5.10 CONCLUSION

The proposed structure resulted in two entangled landscapes. Envisioned as architecture, the two infinite surfaces could form a new and aesthetically appealing interpretation of an office and a living landscape in a hybrid building.

Incorporating the factor of time and therefore dynamic qualities to the proposed building structure resulted in the following observation: the three-dimensionally changing spatial entity, if applied with strictly controlled patterns of use, leads to an aesthetically tempting spatial configuration oscillating between soft-bent- and box-style. Inspired by the balloon model, I aimed to distribute space across the building where spatial volume, when not needed, could be distributed in a three-dimensionally balanced system to as many neighbours as possible. The proposed bicontinuous interpenetrating structure did not provide convincing results. They lead to unexpectedly strong deformations of the space-dividing thresholds. The goal in this chapter was to reduce the level of speculation in a system of distribution of space and combine it with geometrical studies that can support such a system. This is followed by the application of the principles of distribution of space to a specific built context, which will be explored in the next chapter.

6 CASE STUDIES: TRACKS AND CURTAIN

- 6.1 INTRODUCTION
- 6.2 CONTEXT FOR BOTH PROJECTS: CITY & BUILDING
- 6.3 USER SELECTION AND IDENTIFICATION
- 6.4 STRUCTURE AND ITS OPERATIONAL/ DYNAMIC ELEMENTS
- 6.5 DESIGNING OPERATION
- 6.6 MANAGEMENT

- 6.7.1 TRACKS PROJECT - DISTRIBUTION
- 6.7.2 TRACKS PROJECT - SPATIAL ARRANGEMENT
- 6.7.3 TRACKS PROJECT - OPERATION
- 6.7.4 TRACKS PROJECT - PERFORMANCE SIMULATION
METHODOLOGY
- 6.7.5 TRACKS PROJECT - PERFORMANCE SIMULATION RESULTS

- 6.8 CASE STUDY: CURTAIN PROJECT
- 6.8.1 CURTAIN PROJECT - SPATIAL ARRANGEMENT
- 6.8.2 CURTAIN PROJECT - DISTRIBUTION AND OPERATION
- 6.8.3 CURTAIN PROJECT - OPERATION
- 6.8.4 CURTAIN PROJECT - PERFORMANCE SIMULATION RESULTS

- 6.9 TRACKS AND CURTAIN PROJECTS: CONCLUSION
- 6.9.1 LINKS TO PREVIOUS CHAPTERS
- 6.9.2 PERFORMANCE - QUANTITY OF SPACE
- 6.9.3 ARCHITECTURAL QUALITY OF SPACE - INTERIOR
- 6.9.4 OPERATIONAL QUALITIES SPATIAL ENTITIES
- 6.9.5 PATTERNS OF USE
- 6.9.6 ROLE OF USER
- 6.9.7 ROLE OF OWNERS / PROVIDERS
- 6.9.8 EVOLUTIONARY EVALUATION
- 6.9.9 SIMPLICITY
- 6.9.10 OTHER BENEFITS/ECONOMIC & ECOLOGICAL POTENTIAL
- 6.10 CHAPTER'S FINAL NOTE

6.1 INTRODUCTION

The previous chapter discussed speculations about possible spatial configurations, neglecting substantiation at an architectural scale.

The design research will now be applied to an architectural scale in a specific urban context. In the following chapter two case studies will be described and discussed:

The case studies aim to combine two programmes in a hybrid building. The programmes take place at different times of the day and on different days of the week. Dynamic elements in the building allow spatial entities to change the area they cover. Unused space can be distributed to spatial entities in use.

The main objectives addressed in this chapter are:

- Which suitable combination of relevant programmes can be applied?
- How could the operational control of the building be organized?
- Which spatial configurations could support the idea?
- Technically, which concepts could be applied for changing spatial configurations and for the movable elements?
- Can the aims listed above be accomplished in a real urban context by applying a plug-in process that fills up the temporarily expendable physical space of an existing building and programme with a secondary, complementary programme and still maintain the original programme?

Some of these questions have already been partially answered in previous chapters. In this chapter they will be examined to a deeper extent.

The envisioned case study (hybrid building) will be discussed in two very similar design proposals. Both are retrofitting proposals for the very same

floor of the same building. They will demonstrate the capabilities of the operational control system and of the architecture itself during 24 hours of a weekday. One building, one floor, one day! The working title of the two design proposals derives from the technical components that characterize them: *Tracks* and *Curtain*

The chosen combination of programmes is administration and dwelling. Both projects have identical contextual settings and conditions. They differ in the following categories:

- Distribution of space to different numbers of neighbours (from 2 to 20).
- Degree of self-sufficiency of the dwelling units and amount of infrastructural equipment.
- Work scheme (conventional/flex space¹ office).
- Dwelling scheme (conventional/partially serviced)

This leads to different operational and architectural proposals.

On the following pages, as a starting point, I look into the factual context of the city, the site and the technical condition of the building intended to be converted, as well as its current programme. Afterwards, the relevant two user groups for the intended building will be discussed followed by the two design approaches and their operation. These will be split into the topics of operation, functional requirements, technical descriptions and finally a conclusive discussion of both case studies.

¹ 'Flex Space - Wikipedia, the Free Encyclopedia' <http://en.wikipedia.org/wiki/Flex_space> [accessed 21 August 2014].

6.2 CONTEXT FOR BOTH PROJECTS: CITY & BUILDING

The selected urban setting is in the city of Munich. A study from 2011 predicts that due to economic success Munich's population will grow from 1.44 million inhabitants in 2011 to 1.58 in 2020². This development will generate further pressure for Munich's property market, which has been unable to fulfil the market's demands. In recent years this led to an unprecedented increase in housing and rental costs, e.g. from 2012 to 2013 the average rental price for one square metre of a 30m² apartment grew by 13.9%, from 15.78€/m² to 17.98€/m² ³.

Students and lower income citizens are amongst those who suffer the most from this development. At the same time Munich has one of Germany's highest rates of one-person households, more than every second household (>55%) is inhabited by only one person⁴.

The selected building for the intended additional and complementary programme currently accommodates the city of Munich's department for municipal buildings, parks and infrastructure. This department (Baureferat) is responsible for the erection and maintenance of schools, libraries, museums, roads, tunnels, canals, water management systems, public transport etc.

The Baureferat building is situated some five hundred metres from the train station and important traffic hub, Munich East (München Ostbahnhof). From there it takes some eight minutes by underground to the city centre of Munich.

² 'DemoBevProg2011bis2030.pdf', p. 6
<<http://www.muenchen.de/rathaus/dms/Home/Stadtverwaltung/Referat-fuer-Stadtplanung-und-Bauordnung/stadtentwicklung/grundlagen/DemoBevProg2011bis2030.pdf>> [accessed 17 August 2014].

³ 'Mietspiegel München 2014: Was Mieten in München Kostet'
<<http://www.wohnungsboerse.net/mietspiegel-Muenchen/2091>> [accessed 20 August 2014].

⁴ '2014-03-24_Haushaltsprognose_Onlinepublikation.pdf', p. 6
<http://www.muenchen.de/rathaus/dms/Home/Stadtverwaltung/Referat-fuer-Stadtplanung-und-Bauordnung/stadtentwicklung/grundlagen/2014-03-24_Haushaltsprognose_Onlinepublikation.pdf> [accessed 18 August 2014].

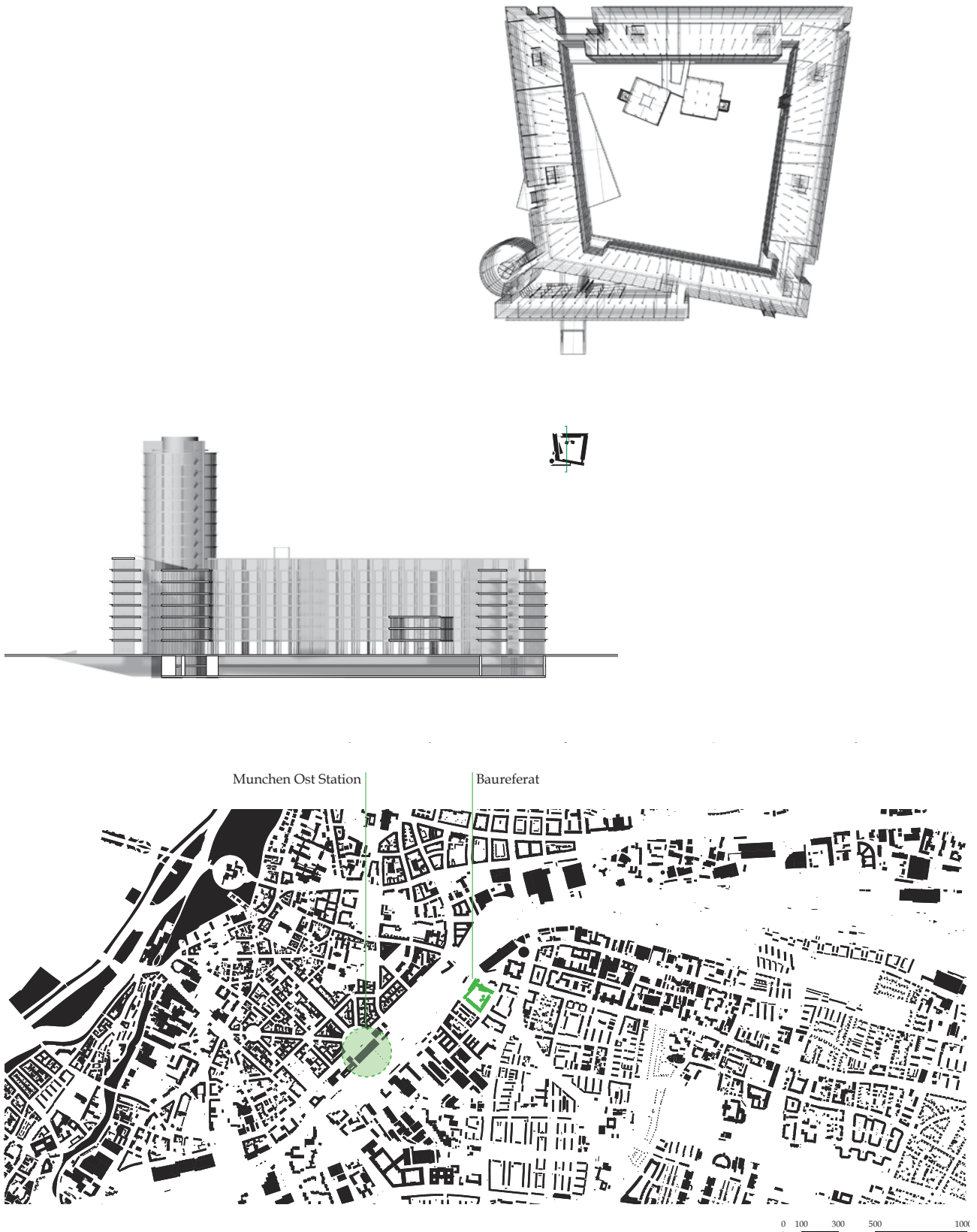


Fig.46
 Top left: Baureferat, Munich, 1999: Current status: Section3D, current status
 Top right: Baureferat, Munich, 1999: Current status: Structural analysis
 Bottom: Baureferat, Munich, 1999: Current status: Urban-site plan

Technical description

The building was completed in the year 2000. It forms an almost quadratic courtyard, surrounded by four seven-storey wings and a 16-storey tower in the north corner. Structurally it consists of a reinforced concrete frame structure with the popular grid size of 4.6 metres and an overall depth of 19.6 metres. It has two outer areas (grid depth 5.8 metres) for offices and a central area of 6.8 metres depth for corridors, stairs, toilets and other infrastructural functions, like photocopier plants and kitchenettes.

The reason for choosing this building for the case studies lies in these combined facts:

- a) The building's structure and arrangement is very typical and commonly used for offices and for administration buildings. It is a good example of the prototype of single-room offices and bigger open-plan offices arranged in a flexible system along both sides of a central access and infrastructure zone. There are hundreds or even thousands of buildings of this kind in Europe and around the world.

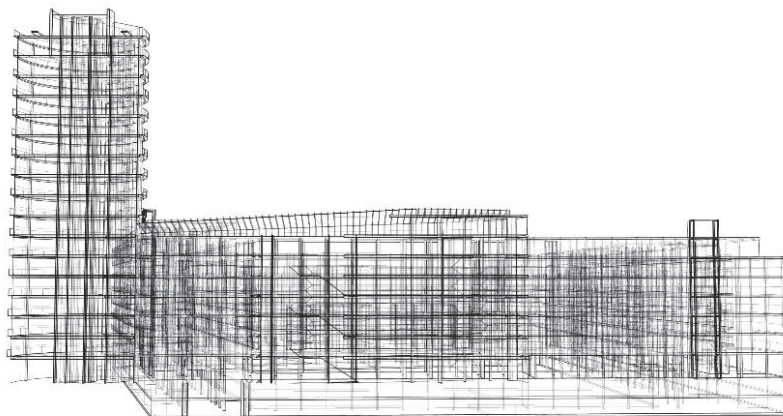


Fig. 47 Baureferat, Munich, 1999: Structure

- b) These buildings of concrete structure and light infill have a high inherent flexibility and can be changed with relatively little effort.
- c) The building's current use as a communal administration building guarantees a high level of predictability for the times it is in use.

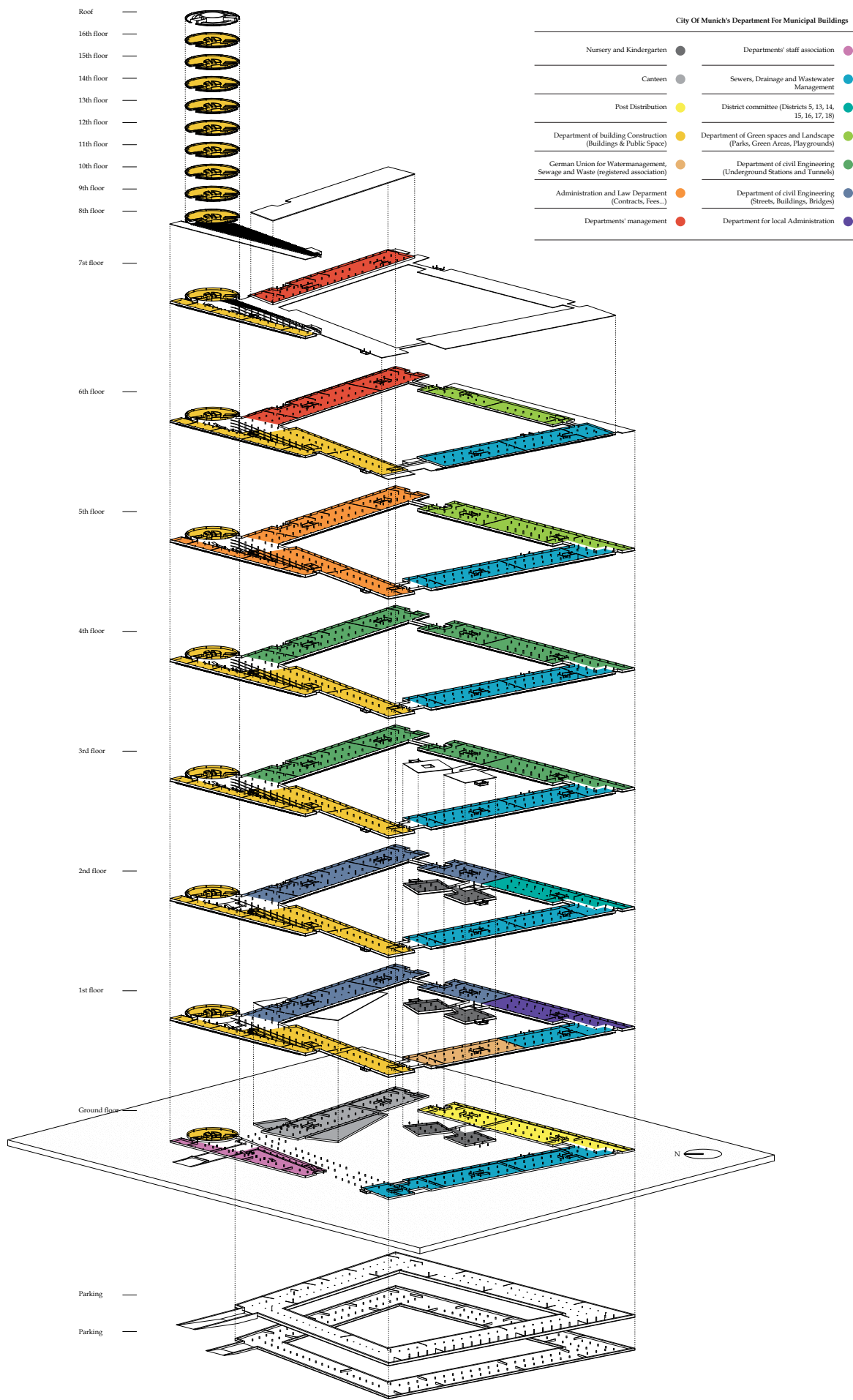


Fig.48
Baureferat, Munich, 1999: Current status: Organisation analysis

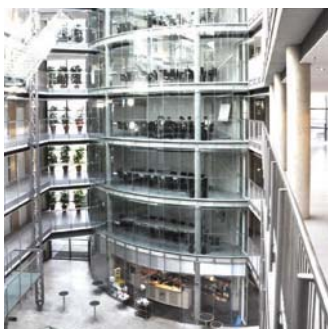


Fig.49
Baureferat, Munich, 1999: Current status: Exterior, current status

Current status of the building

As the interview with the building manager from the earlier chapter has indicated, office hours are from Monday to Friday roughly between 7:30am and 5:30pm with a daily regular working load of eight hours and a flexitime system. The entire building has about 1,200 office rooms for some 1,500 employees. During several visits to the building I could personally observe that an average office room of about 4.6 by 5.8 metres is used by an average of two employees.

For the following case studies I will concentrate on one wing (the southeast wing, internally called *Haus 2*) of the courtyard building and from this wing I have chosen one floor (3rd floor). This storey and its performance will be examined and observed during 24 hours. One building, one floor, one day!

6.3 USER SELECTION AND IDENTIFICATION

The proposed strategy for the two case studies is to complement the programme *administration* with the programme: *dwelling for one-person household*. As the studies of patterns of use from the earlier chapters indicate, these two programmes predominantly take place at different times of the day and week and therefore complement each other regarding time use.

Administration

Public administration patterns of use can be characterized as rigid. Due to strictly enforced employment rights with limited cases of people working beyond the daily arranged hours, the predictability of the pattern of use of an administration building is high and reliable. One might think that this rigidity is a unique phenomenon and is inherent in public administration. However, the real driving force behind strictly kept working hours is a strong workers' representation to enforce this. I experienced this when I

worked for the electronic firm Siemens' architecture department as a trainee. I had a deadline approaching for an interior furniture design and stayed at the office until 10 p.m. The next day I did the same. On the third day a man from the staff association told me I was not allowed to stay at the office beyond 6 p.m.

In the administration building for the case study many rooms are unused during working hours. This is due to the fact that some staff do not work full-time but still have dedicated desk space. Meetings inside or outside of the building keep employees away from their desks as well. When walking through the building, I observed that it is not unusual for about half the office rooms to be empty.

Dwellings as one-person households

The complementary programme has been selected as the one-person household for two reasons:

- a) There is a huge demand for this kind of dwelling in the city of Munich
- b) The patterns of use of the one-person dwelling units are rigid. Either the sole inhabitant is in or he is out, unlike in multi-person households where there is the possibility of varying degrees of inhabitation over time.

The dwellers' survey from the earlier chapters provided a set of data of people and the hours when they are at home. This database will be used to test the intended structure.

6.4 STRUCTURE AND ITS OPERATIONAL/ DYNAMIC ELEMENTS

The intended architectural projects can be labelled in different ways: Kronenberg would probably call it *Architecture that responds to change*⁵, Leupen, Heijne and van Zwol might call it *Time-based Architecture*⁶, others *interactive architecture*.

The physical structures constituting flexible architecture projects, as well as the intended projects, are static and dynamic components. The Italian language logically and beautifully illustrates the difference in the architectural context: the word for real estate (like buildings and land) is *immobili*, which means immobile (static). The word for furniture is *mobile*, which means mobile (dynamic). The static elements are bound in 3 dimensions while the dynamic elements enable the functioning of the whole system as 4-dimensional architecture.

Dynamic elements can change their properties, which can mean the change of geometrical position (e.g. movement of a sliding wall) or the change of their physical properties (e.g. change of temperature of a radiator).

One could argue that a light bulb, operated by a person through the interface of an electrical switch, is a dynamic element (though not all buildings equipped with light bulbs can be regarded as flexible architectures).

While the operational system of a light bulb is relatively easy to define, the envisioned architecture project demands a more complex solution.

⁵ Robert Kronenberg, *Flexible : Architecture That Responds to Change* (London: Laurence King, 2007).

⁶ Bernard Leupen, Rene Heijne and Jasper van Zwol, *Time-Based Architecture* (Rotterdam: 010 Publishers, 2005).

6.5 DESIGNING OPERATION

The operational matrix, a term used by Cedric Price to describe 'a tool for the user rather than for the designer'⁷, is a relevant part of the system. Its design is of equal importance to the design of the structural and space defining components. Structure and operational intelligence go hand in hand, both need to be designed and cannot be separated from each other. (C. Price leaves space for unpredictability and for the delight of the unknown while this is not intended in this project).

The operational matrix consists of rules and algorithms to control⁸ the dynamic components. The aim is to define which building component moves where and when and is actuated by what.

In fact, the starting point for *Tracks* is the design of the operational system. Only later are the physical components defined.

The proposed concepts stipulate the distribution of office space when it is unused. Expendable space can be given to other occupants. The same applies to unused dwelling space. The active participants of the distribution process are:

- The users of the dwellings
- The users of the offices
- The dynamic architectural components

The aims for the design of the operational matrix are:

- The generation of a distribution system for unused space depending on presence/absence of participants.

⁷ Cedric Price, *Cedric Price*. ([London]: [Architectural Association], 1984), p. 89.

⁸Though Price states: 'space is ordered, not controlled' Price, p. 92.

- The provision of a bottom-up controlling mechanism for all participating users and freedom of choice.
- A balanced system of distribution of unused space to a defined group of recipients.

6.6 MANAGEMENT

The level of self-organisation is dependent on the superior hierarchy element (entities): who owns and operates the building and its control mechanisms? For the current case-studies, I envision the city of Munich being the operator, maintaining the administration programme but complementing it with the programme of affordable housing or with student accommodation, within a state-owned building.⁹

⁹ For more on possible management structures and forms of ownership for the proposed case studies see Appendix A.6.1

6.7 CASE STUDY: TRACKS PROJECT

Tracks is informed by the findings of the speculative approach. Like in the *Balloon* project, the aim is to spread the expendable space to as many participants as possible.

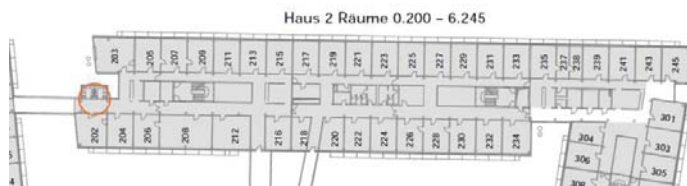
TRACKS PROJECT - PROGRAMME

The programme consists of the combination of administration offices for a large department of the public authority of the city of Munich and individual dwellings¹⁰.

Programme of the administration offices

The selected storey (3rd floor) in the selected wing (Haus 2) currently has 22 plus 16 = 34 office rooms providing 68 workspaces (2/room) and four meeting rooms. The office concept is traditional; it consists of personalized workspace where each employee has his own allocated desk and chair. The office rooms are arranged along the central corridors; means of access and facilities like photocopier plants, server rooms, archives, kitchenettes, toilets, cleaning rooms are arranged between the corridors, in the core zone. This programme, exactly as currently found, will be retained.

Fig. 50 Baureferat, Munich, 1999: Plan of Haus 2



The dwellings constitute the complementary programme to the administration offices, using the unused capacities of the administration building.

¹⁰ This programme should not be confused with a popular scheme in the UK: live-work units, a concept where self-employed professionals, small businesses or start-ups combine their office space with the place where they live in the same architectural unit

The programme of individual dwelling units consists of:

- Furnished studio flats, approximate size 25 m²;
- Fittings/equipment: bathroom with shower, small kitchen, dining area, sofa area, bed and study area, storage;
- Some services/amenities, like laundry services are provided outside the flats in a shared laundry room on the corridor. The already existing canteen for employees' lunch can provide additional evening dining services for the dwellers.

The amount of dwelling units will be determined by a reasonable fitting of these dwellings, maintaining a reasonable quantitative and qualitative standard (i.e. no luxury flats but also not social housing standard).

The user group spans from students to young professionals.

6.7.1 TRACKS PROJECT - DISTRIBUTION

In the first instance, any given space (v) is divided into a number of participants (n). This results in n spaces for n participants. These spaces will be called *guaranteed spaces*. Each participant has his guaranteed space assigned (when he/she is at home).

Example:

If $v = 100 \text{ m}^2$ and $n = 10$ this results in 10 guaranteed spaces of 10 m^2 each. This configuration will be called *basis configuration*.

(The guaranteed spaces will not necessarily be of equal size but for this example I'd like to keep it like that.)

The hypothesis is that any unused space is expendable and therefore could be distributed to other participants. If any participant leaves the building, and therefore also his guaranteed space, this participant is being given the

opportunity to make part of his unused (and therefore expendable space) available to any number of other participants.

Taking the example from above:

If one participant (let's call him Frank), after he leaves the building, decides to make available half of his guaranteed space to all other participants, this leads to the following configuration:

Frank's space now only extends to 5 m², the other 5 m² is made available to the other participants. I call the amount of available space the *pool*. The 5 m² in the pool will now be split into nine equal parts and these will be made available to the other participants:

5 m² divided by nine receiving participants gives each of them an additional space of 0.55 m² and makes their space grow to 10.55 m² each.

0.55 m² does not make a big difference, but if more participants leave the building and make their space available to others, the proportions change significantly.

If five participants are out of the building and all decide to allocate 5 m² each into the pool, then the remaining five participants can benefit from 5 more square metres each resulting in a growth by 50% (from 10 m² to 15 m²).

The distribution is calculated by this equation

$$L_o^n = L_a + \left(\left(\frac{L_t}{U_t} - L_a \right) \times P^n \right) + \frac{U_a \times \left(\frac{L_t}{U_t} - L_a \right)}{U_t - U_a} \times P^n$$

Fig. 51 Distribution Equation

<i>L</i> = length	<i>a</i> = absent
<i>U</i> = users	<i>t</i> = total
<i>P</i> = presence	<i>d</i> = distributable
	<i>g</i> = guaranteed
	<i>r</i> = resulting
	<i>o</i> = occupied

Fig. 52 Distribution Parameters

The operational approach and the user experience and interaction for this model are as follows: Frank, when he has left the house, can either agree or disagree to make his space available. He does this by operating an application on his smart mobile device. On his way back, the same application (via GPS) registers his approximation and by the time he arrives at the building, the guaranteed size of his space is re-established.

When all participants are in, all participants get their guaranteed space (*basis configuration*).

6.7.2 TRACKS PROJECT - SPATIAL ARRANGEMENT

Haus 2 (equally Haus 1 and 3) will be divided into three zones. The central zone is the most public area providing access for the offices and for the dwellings¹¹. The central zone will also contain infrastructure and services for the office users as well as a laundry room for the dwellers. The outer zones will house the individual dwelling spaces as well as the office spaces for four employees.

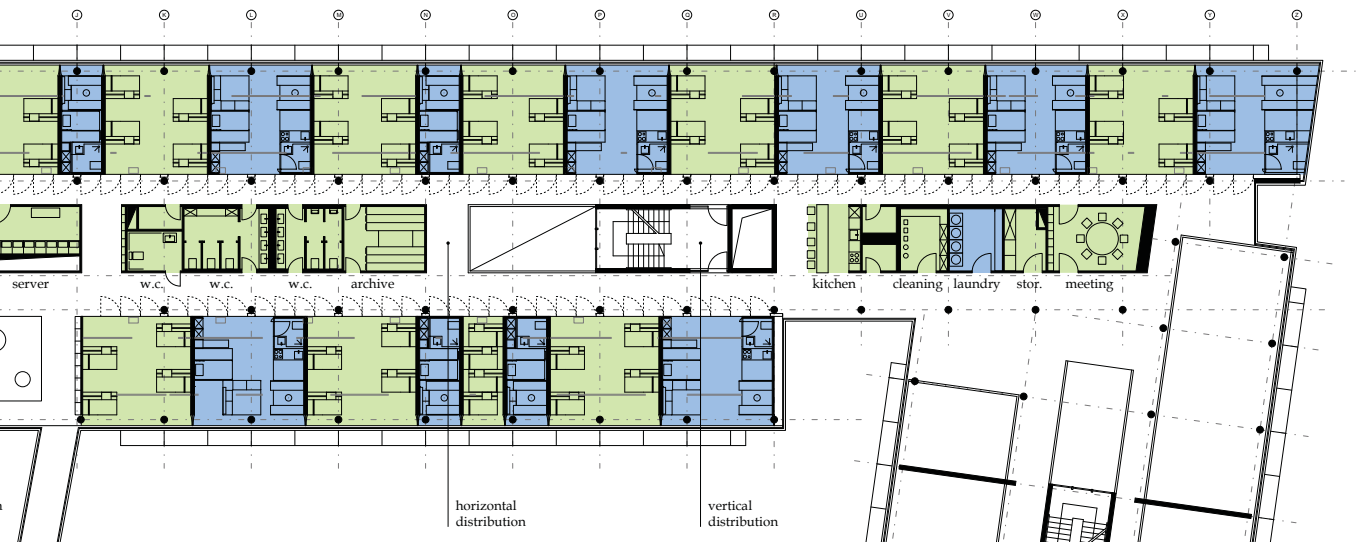
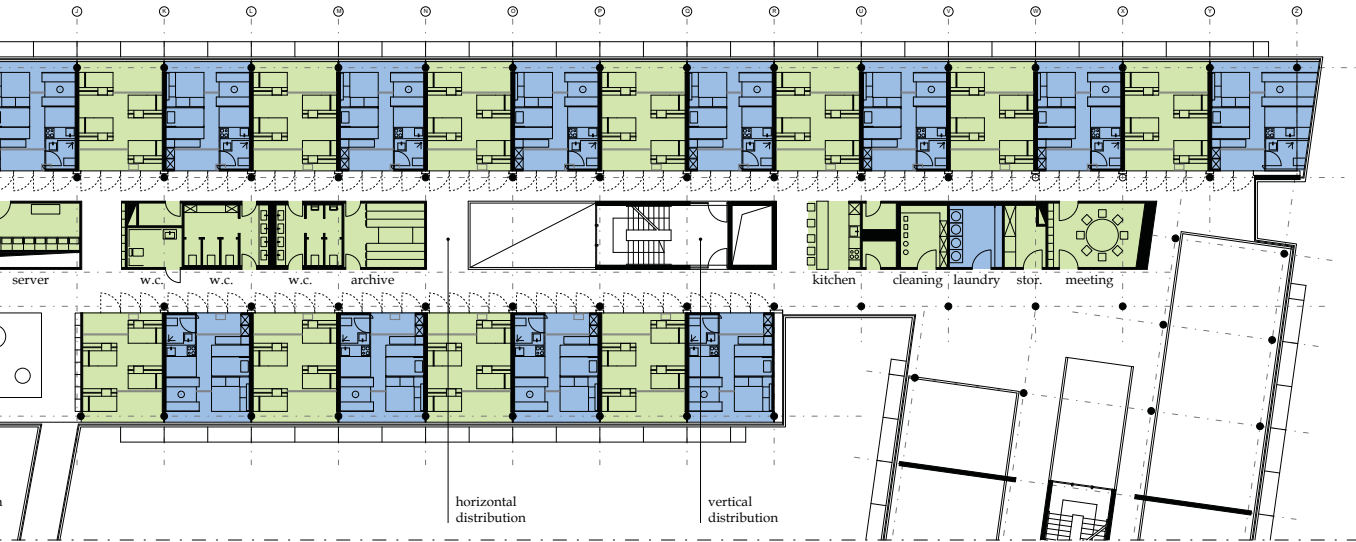
The starting point for the spatial arrangement is:

- Equally sized spaces for all office rooms and for all studio flats, providing an area of 4.6 m by 5.4 m = 24.8 m² each. This 24.8 m² will be called the guaranteed size.

¹¹ This is also the condition of the building today. It can be freely accessed without any special permission.



Fig.53
 Case Study Tracks:
 Top: Basis configuration
 Bottom: Spatial entities configurations according to the system of distribution of space



- The rooms are arranged linearly in a chain of single spatial entities, alternating in the office pattern – dwelling – office – dwelling and so on.
- The rooms are separated by movable partition elements, which are also inhabitable furniture with multiple functions. They move on a set of rails which run parallel to the façade and are arranged perpendicular to the rails.
- Both kinds of moving and inhabitable elements contain furniture and infrastructure parts for the two different spaces they separate. They are called *dry wall* and *wet wall*.
- Each space is confined by these two walls only. The distance between the two walls varies and defines the size of the spaces. The distance and therefore the size of the space is set by positioning the walls at defined positions. The positions are calculated by the operational system which I describe later. Unused spaces can become small (down to 12.4 m²) and used spaces can become large and gain in usable area.
- The dwelling side of the *wet wall* contains a small bathroom with shower, toilet and basin, a small kitchen with fridge, hob and sink and a dining area, seating up to four people.
- The dwelling side of the *dry wall* incorporates storage, a study area and a bed. An independent sofa platform is attached to it.
- The office sides of the *dry wall* and the *wet wall* each contain two conventional workspaces with a desk, a chair and some shelving.

Dry wall and *wet wall* perfectly fit into each other (like a 3d-puzzle). They can be positioned indenting very tightly, like in a lock and key system. In this tightly stacked position the width between the centre-lines of the walls can be reduced to 2.3 metres which is 50% of the width of the guaranteed space size.

Due to the walls' movement the individual rooms between them can change position. Therefore the wall separating the corridor consists of a row of doors assuring access to all rooms whatever their position and size. The operation of the doors can be controlled electronically with a pin system.

6.7.3 TRACKS PROJECT - OPERATION

The starting point is the standard distribution of the spaces amongst the participants. A dwelling space is allocated to one dweller and an office space is allocated to four employees. In this guaranteed space position the separation walls are all positioned exactly between the columns at a distance of 4.6 metres. Like this all rooms have the same size, be it dwelling or office. The size is 4.6 by 5.4 metres = 24.84 m².

The system has the capability to distribute expendable space in unused rooms to other rooms, where users are present and can benefit from additional space above the guaranteed size.

The distribution system is operated on the basis of absence of the participants. Each space has an assigned value (P) that oscillates between zero and one. For the dwellings this value depends on the absence of the dweller and for the office rooms this value depends on the absence of all employees at any time.

The values will be generated depending on the geographical position of the participant(s). GPS (global positioning system) sensors inside standard smart mobile devices provide the information via mobile communication to the operating system.

The standard value is one (guaranteed space size). If a dweller or all employees of one office room is/are within a predefined geographical distance (actuation distance 1) of their space, this value is one. From that distance, with additional distance, the value gradually goes down to zero

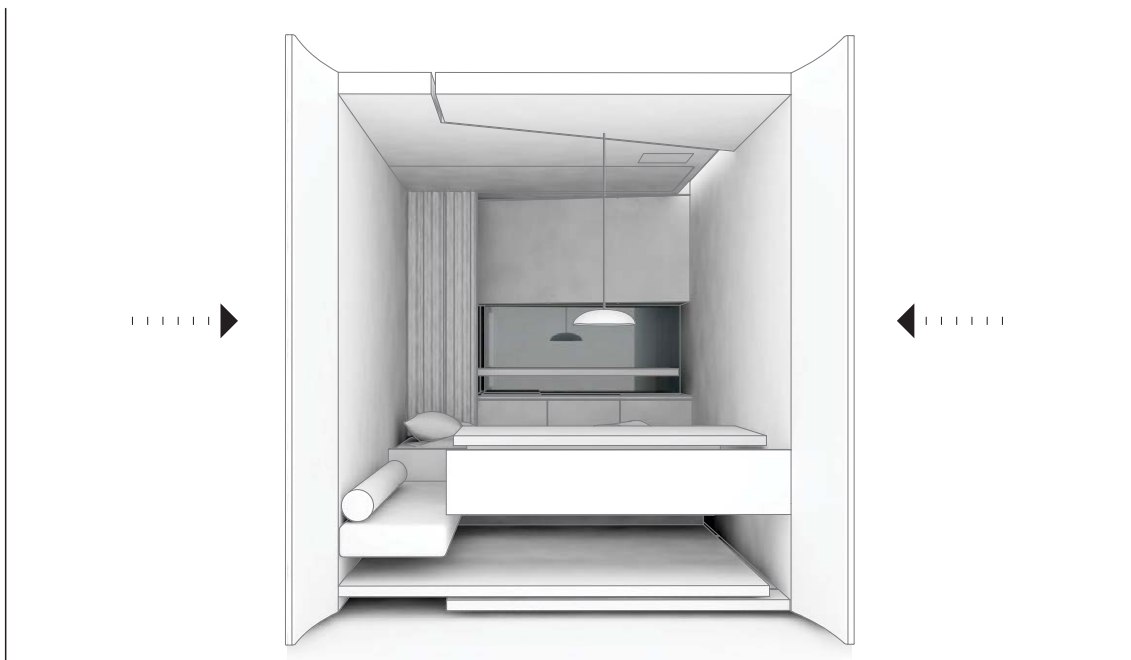
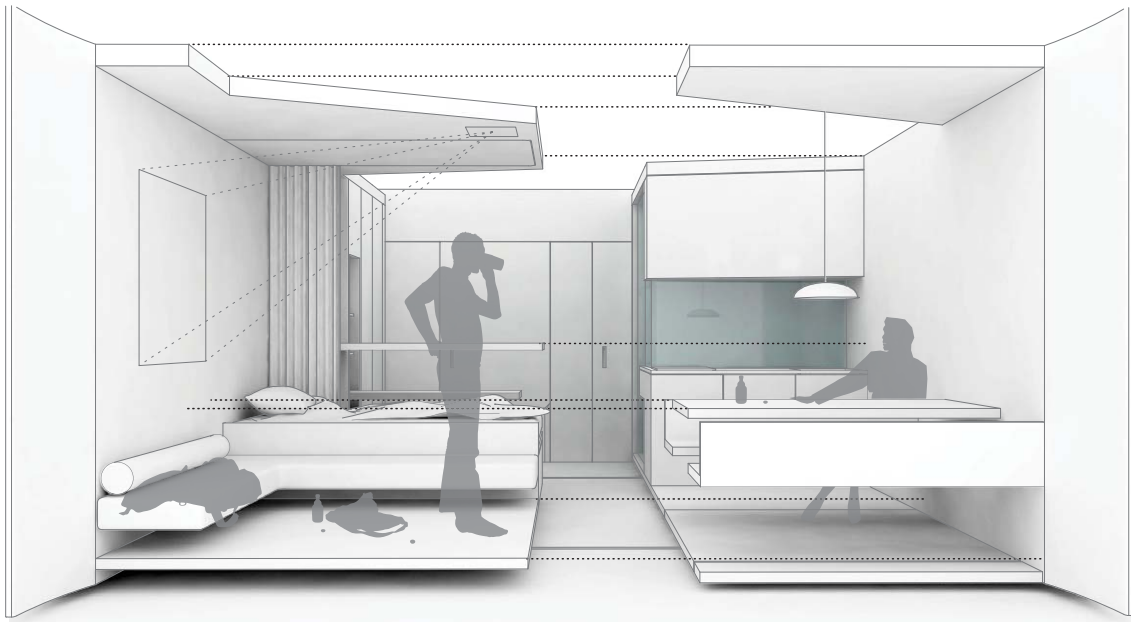


Fig.54
Case Study Tracks:
Top: Dwelling unit guaranteed size
Bottom: Dwelling unit in absent mode

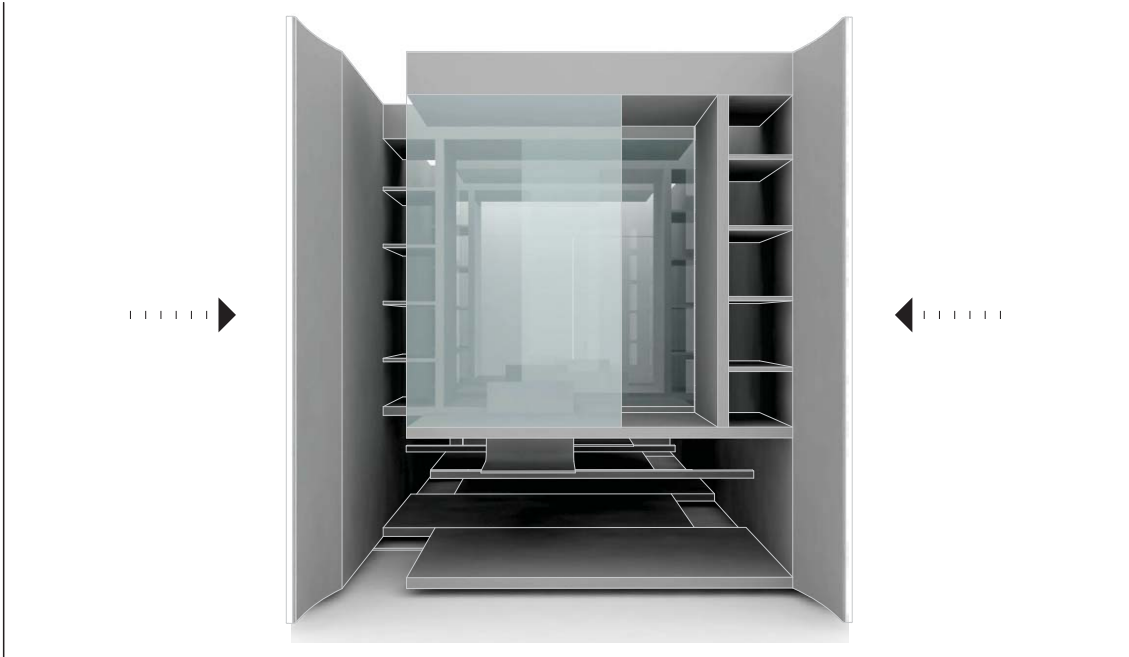
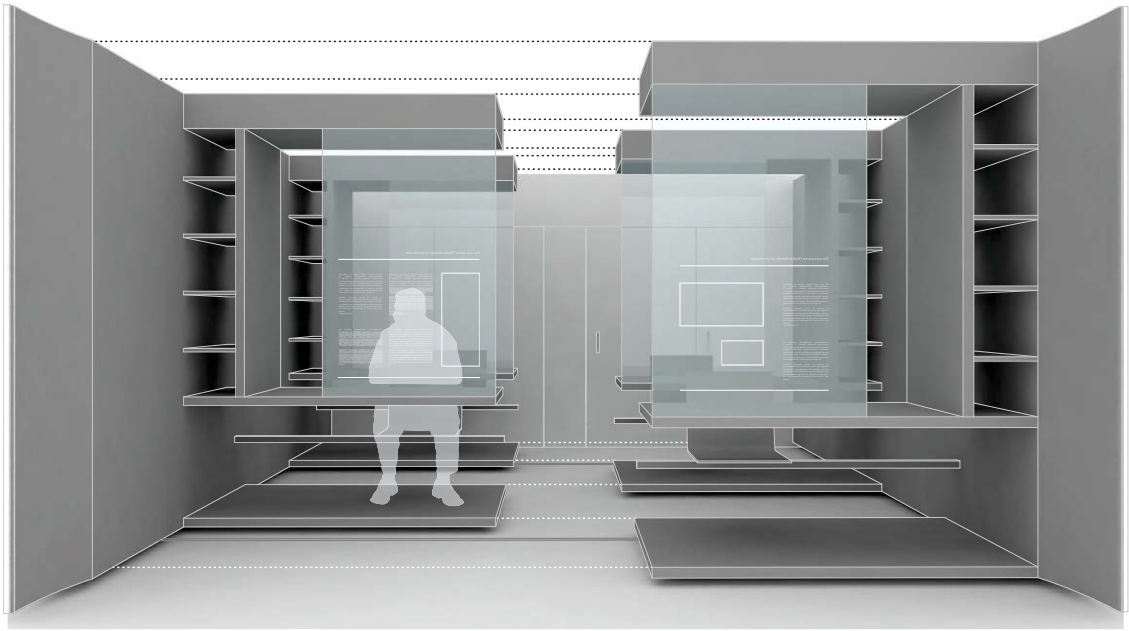


Fig.55
Case Study Tracks:
Top: Office unit guaranteed size
Bottom: Office unit in absent mode



Actuation start and end distance for provision of space
 -value 1= user present
 -value 0= user absent

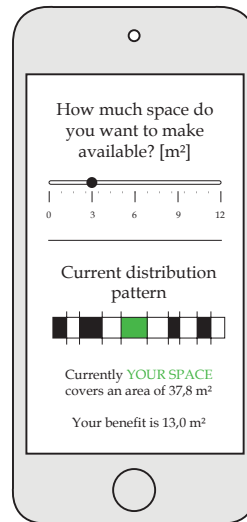
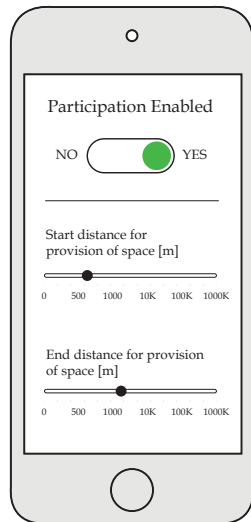


Fig.56
 Case Study Tracks: Exemplary application for GPS-sensed smart mobile devices.
 Bottom up approach for the distribution of space.

until a certain second distance (actuation distance 2) from the building is reached. Beyond that distance the value stays at zero.

For the dwellers the two distances could be set to 500 metres and 1000 metres¹². For the employees a faster reacting system could be reasonable with lower values for the two actuation distances. Alternatively the system could be synchronized with the work time recording system.

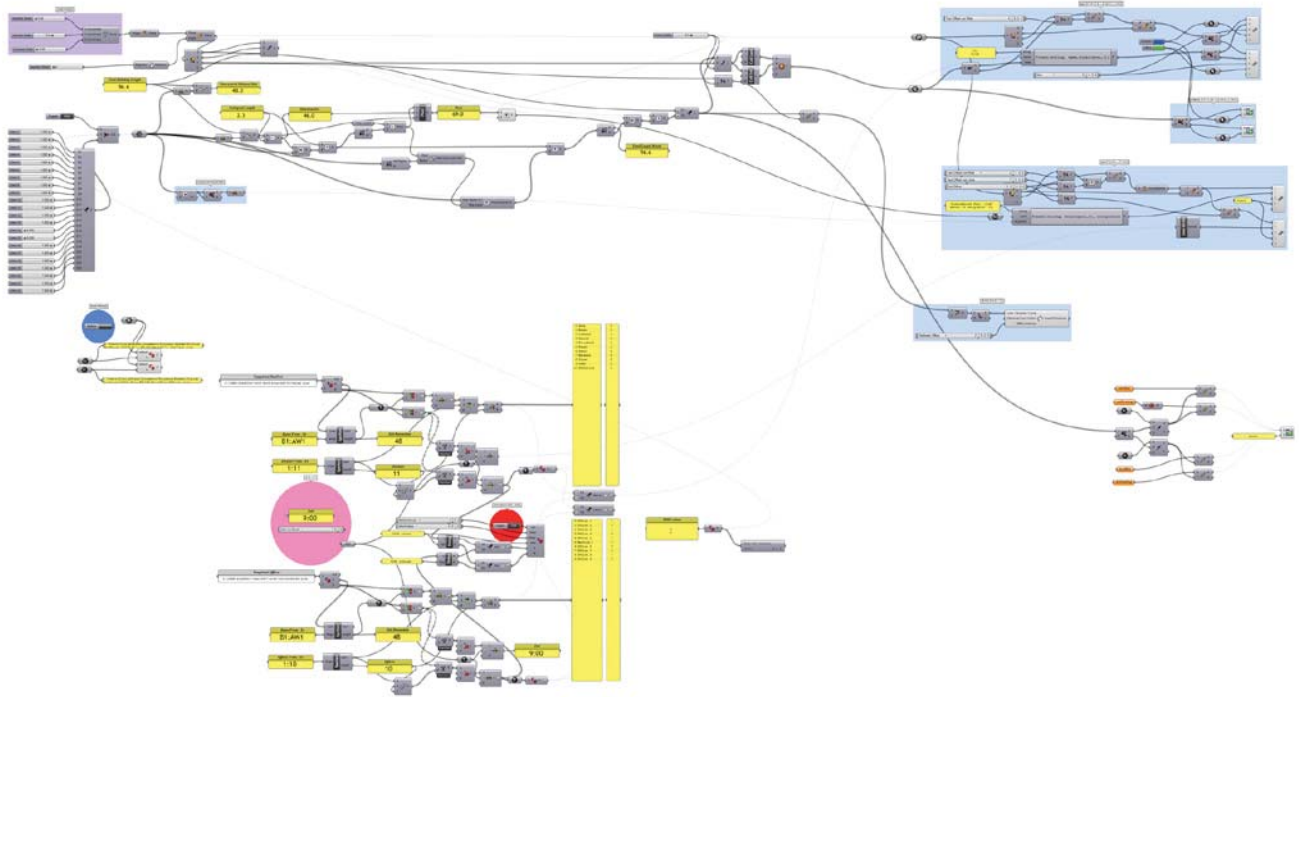
This method enables spaces to be 'in position' when people approach them.

All rooms with any value between 0 and 0.99 belong to the group of space providers. The provided space is unused anyway. The spaces with value 1 are part of the group of receivers (assumed there is at least one provider). Dwellers or employees of the receiver spaces are the spatial beneficiaries.

The operation system permanently collects data from all the participants and a distribution algorithm computes the positions of each single separation wall.

An application for smart mobile devices ensures that all participants have control over their space. The dwellers and the employees can decide if they participate or not and at which distance their space is distributed to others. If a participant decides not to participate, his/her space maintains the guaranteed size (24.8 m²), though her/his space might change position. The application could be imagined as a simple programme where a few parameters could be set and where the performance of the building can be monitored for the avoidance of surprises (see illustrations).

¹² The value can be set to any distance preferred by the user



TRACKS PERFORMANCE

Time	Anna Dwocł	Office 1 Dwocł	Brona Dwocł	Office 2 Dwocł	Chauka Dwocł	Office 3 Dwocł	Daniel Dwocł	Office 4 Dwocł	Elisabeth Dwocł	Office 5 Dwocł	Frank Dwocł	Meeting Dwocł	Genie Dwocł	Office 6 Dwocł	Hermann Dwocł	Office 7 Dwocł	Erna Dwocł	Office 8 Dwocł	John Dwocł	Office 9 Dwocł	Katharina Dwocł	
00:00	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	
00:30	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	
01:00	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	
01:30	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	
02:00	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	
02:30	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	
03:00	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	
03:30	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	
04:00	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	
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08:00	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	29,81	
08:30	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	
09:00	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	32,48	
09:30	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	36,15	
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11:00	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	34,15	
11:30																						
12:00	55,89					55,89				55,89	55,89									55,89	55,89	
12:30	55,89					55,89				55,89	55,89									55,89	55,89	
13:00	45,02					45,02				45,02	45,02									45,02	45,02	
13:30	38,50					38,50				38,50	38,50									38,50	38,50	
14:00	41,48					41,48				41,48	41,48									41,48	41,48	
14:30	38,50					38,50				38,50	38,50									38,50	38,50	
15:00	38,50					38,50				38,50	38,50									38,50	38,50	
15:30	38,50					38,50				38,50	38,50									38,50	38,50	
16:00	45,02					45,02				45,02	45,02									45,02	45,02	
16:30	49,68					49,68				49,68	49,68									49,68	49,68	
17:00	55,89					55,89				55,89	55,89									55,89	55,89	
17:30	49,68					49,68				49,68	49,68									49,68	49,68	
18:00	55,89					55,89				55,89	55,89									55,89	55,89	
18:30	49,68					49,68				49,68	49,68									49,68	49,68	
19:00	49,68					49,68				49,68	49,68									49,68	49,68	
19:30	49,68					49,68				49,68	49,68									49,68	49,68	
20:00	49,68					49,68				49,68	49,68									49,68	49,68	
20:30	41,48					41,48				41,48	41,48									41,48	41,48	
21:00	41,48					41,48				41,48	41,48									41,48	41,48	
21:30	41,48					41,48				41,48	41,48									41,48	41,48	
22:00	38,50					38,50				38,50	38,50									38,50	38,50	
22:30	38,50					38,50				38,50	38,50									38,50	38,50	
23:00	38,50					38,50				38,50	38,50									38,50	38,50	
23:30	38,50					38,50				38,50	38,50									38,50	38,50	
hours	1.286,22	682,81	1.272,87	636,22	1.213,25	566,49	1.055,47	874,89	909,78	577,86	1.634,35	246,40	1.253,69	536,69	682,79	774,53	882,44	661,07	967,57	648,68	842,47	
avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	avg. h/dw	
hours of dwelling occupation	16,90	17,00	22,00	14,00	14,00	12,00	15,00	15,00	15,00	15,00	15,00	9,00	12,00	13,00	13,00	13,00	13,00	13,00	11,00	11,00	11,00	
average dwelling occupancy	39,84	37,44	36,94	37,70	37,89	36,77	40,44	36,89	36,77	37,21	36,63											

reference area from existing space of building 24,88 m²
 271,04 143,67
 288,4 142,02

/number of dwellings (11) average of hours of occupation of 14,68 dwellings 148,50
 /number of dwellings (11) average number of occupied dwellings 37,88 dwellings 426,91
 /number of offices (10) average of hours 132,18 %

Fig.57
 Case Study Tracks: Grasshopper script and founding mathematical expression

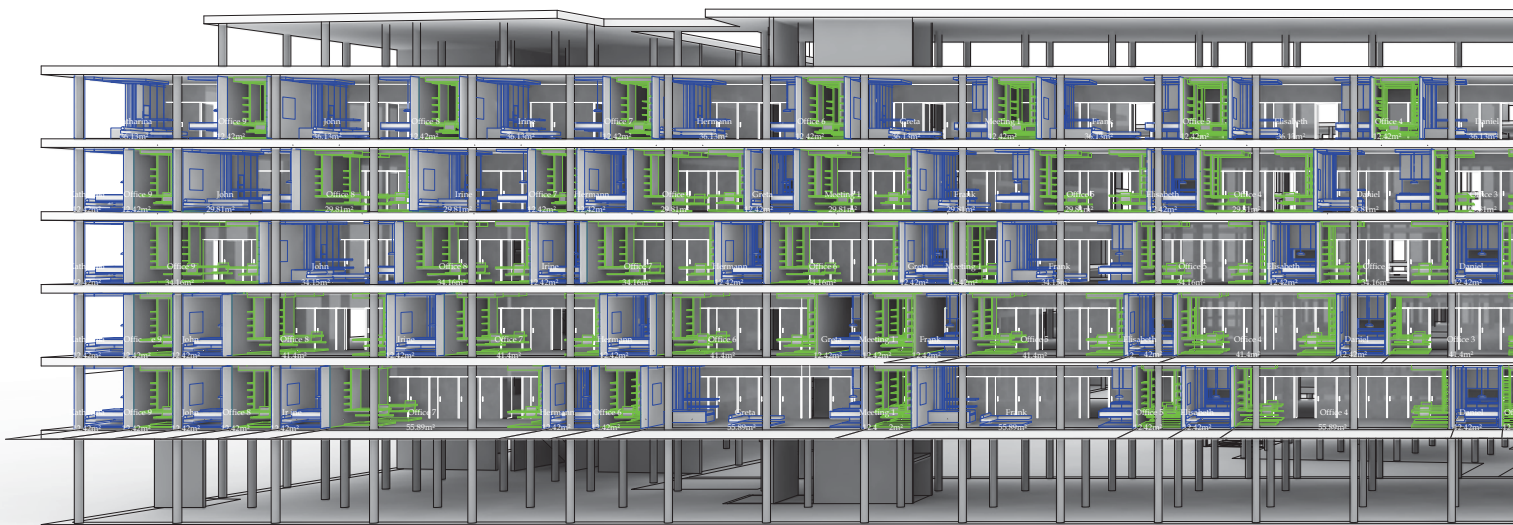
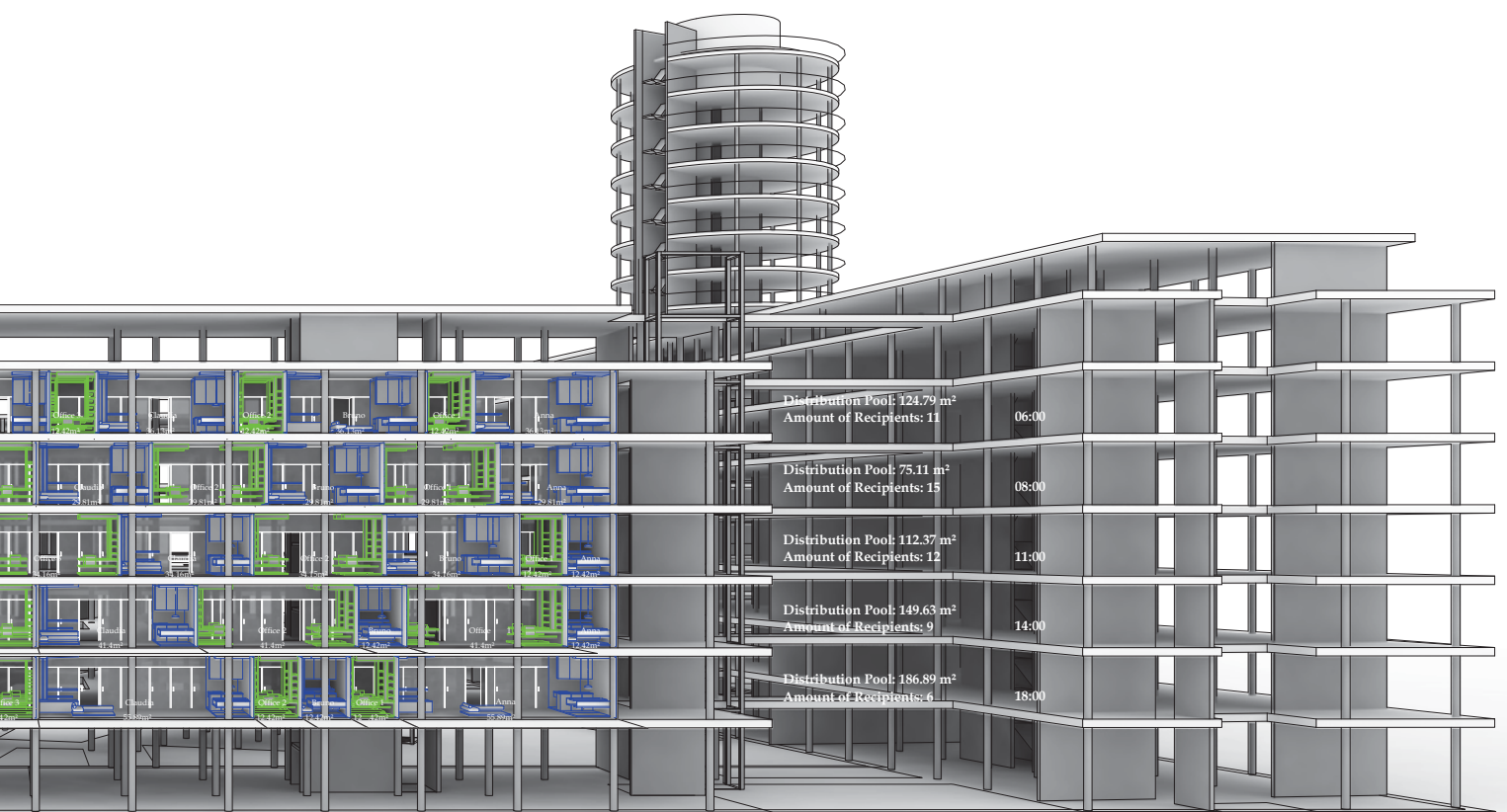


Fig.59
 Case Study Tracks: South east elevation at Trausnitzstraße: The elevation displays at each storey a different time of the simulated day:
 5th floor = distribution at 6:00 h, 4th at 8:00 h, 3rd at 11:00h, 2nd at 14:00 h, 1st. at 18:00 h



the names of the participants of the survey. The randomly chosen weekday is Monday.

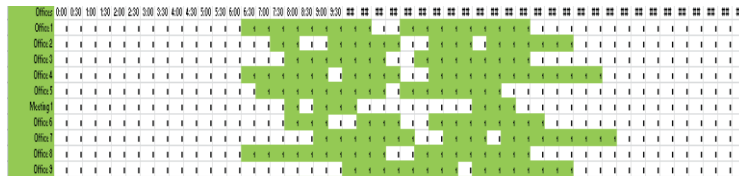


Fig. 60 Case Studies, Offices Spreadsheet

The office spreadsheet has been generated on the basis of the information provided by the building manager of the existing building and of personal observations during several visits to the building.

The simulation has been captured with two different media, a diagram and an animated movie.

The diagram visualises the spatial performance of every single spatial entity and provides each room size's performance over the course of one day, captured every half hour. The rows represent the half hour steps and show where each room is at a specific time of the day, e.g. at 14:30. Blue areas are dwelling areas and green areas are office areas. The areas represented in the diagram reflect the real proportions of the areas.

6.7.5 TRACKS PROJECT - PERFORMANCE SIMULATION RESULTS

The diagram delivers the following information:

General observations for the simulated day:

- At no time are all spaces used.
- The smallest size of any used space is 29.81 m² resulting in a spatial difference of 4.97 m² over the guaranteed size of 24.84 m² (at 7:00hrs

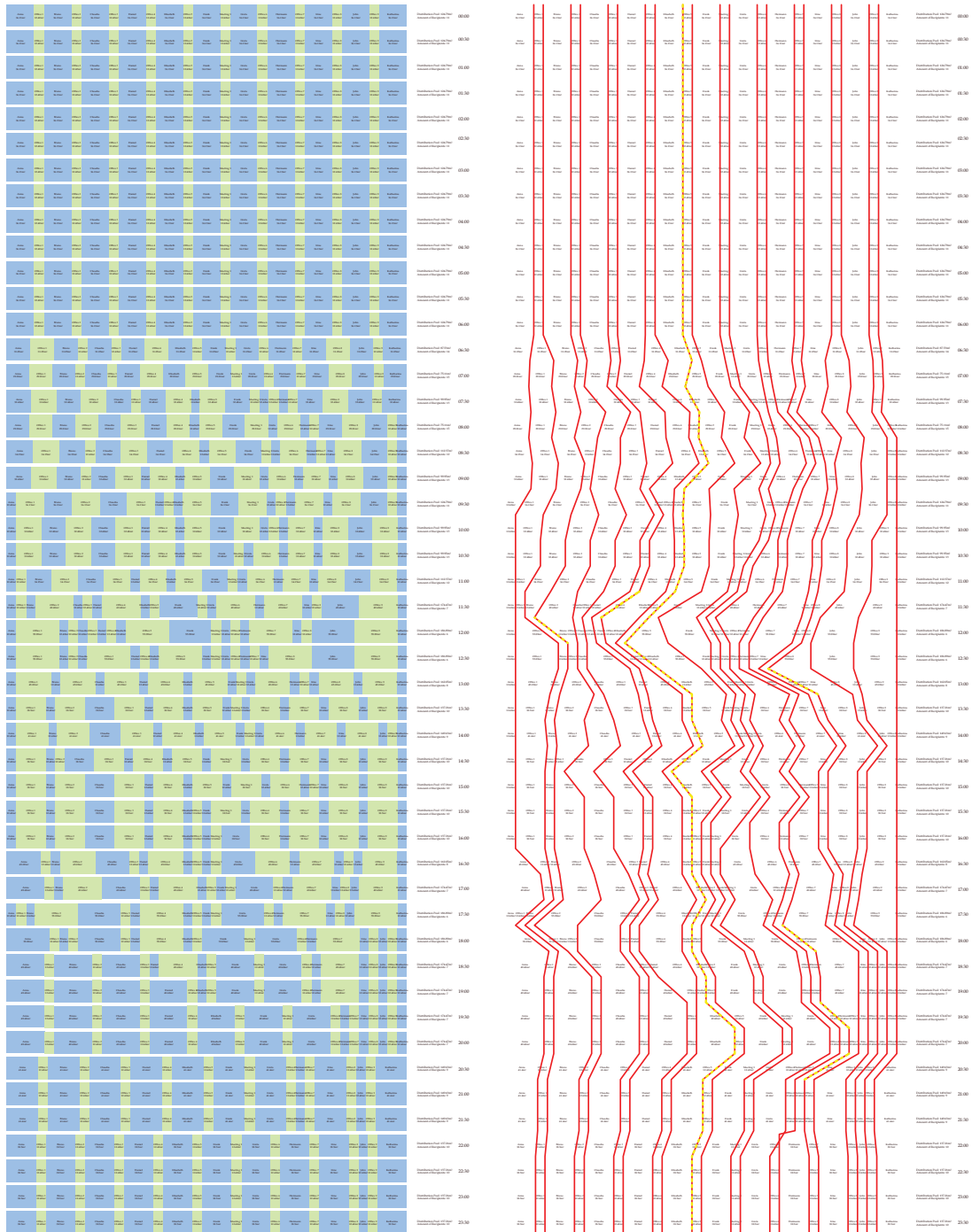


Fig.61
Case Study Tracks: Record of the dynamic performance over 24 hours (48 times 30 minutes)
and their spatial representation and performance of space dividing thresholds (right)

and at 8:00hrs). The resulting growth factor is 120%. At these times 15 out of 21 rooms are used.

- The biggest size of any used space is 55.89 m² resulting in a spatial difference of 31.05 m² over the guaranteed size of 24.84 m² (at 12:00hrs and at 18:00hrs). The resulting growth factor is 225%. At these times 6 out of 21 rooms are used.
- The moving wall with the biggest range is the wall between *office 6* and *dweller Greta*. The sum of the amplitudes of movement in both directions is 27.60 metres (10.04 m north and 17.56 m south).
- The moving wall with the biggest distance covered in 30 minutes of a used space is the wall between *office 8* and *dweller Irine*. It covers 12.08 metres and therefore moved with a speed of 6.7 mm per second.



Fig. 62 Case Studies Tracks,
Fastest moving separation wall

Dwelling observations:

- During the average use time of the dwellings of 14.68 hours, the dwelling spaces had an average size of 37.82 m².



Fig.63
 Case Study Tracks:
 Top: Dwelling unit
 Bottom: Office unit

- The used dwelling spaces provided a total of 416.91 m² dwelling space for the 11 dwellers. This is 152.58% of the guaranteed size of 273.24 m² and represents a gained area of 143.67 m².

Office observations:

- During the average use time of the offices of 7.90 hours, the office spaces had an average size of 39.04 m².
- The used office spaces provided a total of 390.42 m² office space to the 10 x 4 employees. This is 157.17% of the guaranteed size of 248.40m² and represents a gained area of 142.02 m.

The animated movie was made to give a visual impression of how the spaces physically change over the course of one day. The movie shows the Tracks project and the Curtain project (see next chapter).¹⁴

A description of the technical components of the Tracks project can be found in the appendix.

¹⁴ To be viewed on the internet at this address: <https://vimeo.com/105620841>
The password is: f9Fqj8

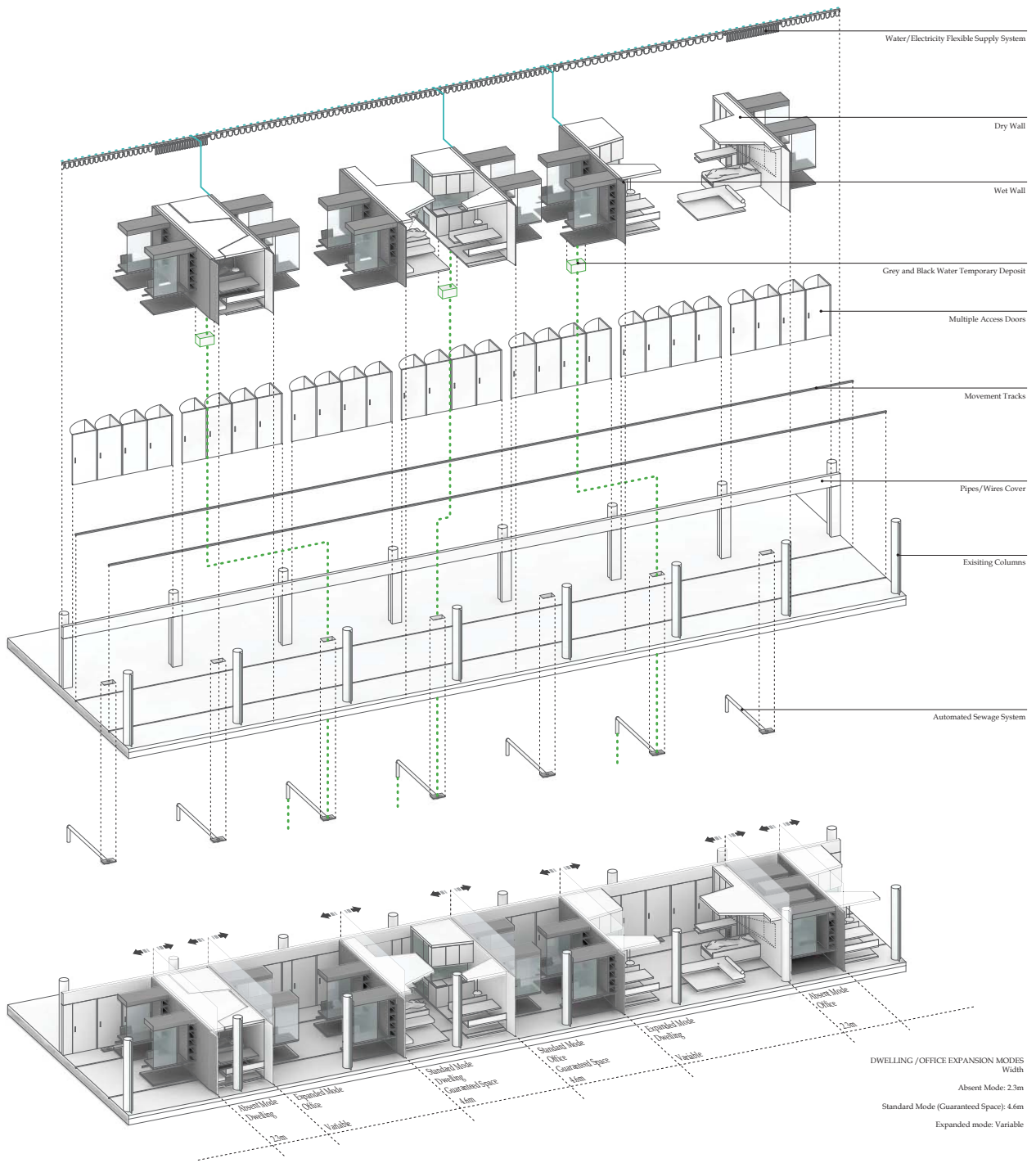


Fig.64
Case Study Tracks: Technical components

6.8 CASE STUDY: CURTAIN PROJECT

The *Tracks* project starting point is the idea of a distribution concept where design follows distribution. The *Curtain* project starts with a spatial concept and then operational components are designed accordingly for it.

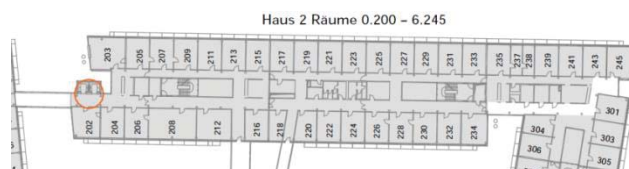
Inspired by an indeterminate empty space like in Archizoom's No Stop City (a combination of flexibility by redundancy and technical means) the existing administration office spaces are imagined as an open landscape with as few fixed entities as possible. Dynamic objects provide most functions: office desks and furniture and the dwelling's study compartment and living room/lounge areas can all move independently. The only static parts are the dweller's private sanitary installations with attached sleeping compartment. The separation of the spaces is performed by bending soft walls that move on predefined paths.

CURTAIN PROJECT - PROGRAMME

Programme of the administration offices:

In comparison to the rather conventional programme of the tracks project, the curtain programme can be called progressive or even experimental. The currently installed administration office programme will be retained with regard to the number of workspaces provided for the employees. The personally allocated workspace though will be replaced by a system of movable hot-desking.

Fig. 65 Baureferat, Munich, 1999: Plan of Haus 2



The dwellings again constitute the complementary programme to the administration offices, filling the temporary gaps:

Programme of individual dwelling units:

- Serviced and furnished studio flats, approximate size 25 m².
- Fittings/equipment: minimal bathroom with shower, minimal kitchen closet with a small hotel fridge, a small sink and a microwave oven, suitable for warming up food; sleeping compartment, sofa and leisure zone; study/dining area, small storage area.
- The provided services are a dining restaurant for the inhabitants which uses the facilities of the canteen of the administration building, a laundry room and a shared communal kitchen on the corridor.

The number of dwelling units will be determined by a reasonable fitting of these dwellings, maintaining a reasonable quantitative and qualitative standard (i.e. no luxury flats but also not social housing standard).

The user group spans from students to young professionals. Culturally they belong to Gen Y, the digital natives (see glossary).

6.8.1 CURTAIN PROJECT - SPATIAL ARRANGEMENT

Dwellers' Islands in the Office Landscape

In unused condition, the dwellers' spatial entities are contracted. They form spatial islands, surrounded by office areas. Vice versa, when the offices (one spatial area suits four desks) are unused they configure a cluster and mutate into small islands of furniture containers and leave space for what could be understood as a dwelling landscape.

The absence is expressed by encapsulation and by a move to the less attractive area of the building, away from the facades; this movement allows access to the windows, to natural light and to ventilation for others.

The only fixed entity is the dwellers' access to sanitation, to water supply and disposal. It also contains the sleeping compartment and serves as the anchor for the dynamic components of the dwelling.

A necessary parameter is the equal distribution of space amongst all participants with the assumption that they are all present at the same time. In this (theoretically possible but in fact rare) situation the spaces are divided identically as in the basis configuration of the tracks project, though this is achieved by different mechanical tools.

In the *basis configuration*, each *spatial entity* (dwelling or cluster of four administration employees) measures 24.66 m². This is also the guaranteed size of each *spatial entity*.

Dwellings

The dwellings - partially serviced (food and laundry) homes for students and for 'limited period living' - consist of three puzzle style pieces of furniture. One is fixed and contains, as core element for the most private functions, the bathroom cubicle and the sleeping compartment. This compartment also has a minimal kitchen with a hotel fridge, a small sink and a microwave oven. It serves for storing and warming up food but is not suitable for the preparation of meals. The other two elements are moving platforms with a space-defining back wall that functions as a space shield. One provides the living room lounge (with sofa, shelving, entertainment) and the other provides the study/sitting area (with table, benches and shelves) and each can rest in different positions along a predefined track in the floor.

The possible positions for the lounge element are L.1, L.2, and L.3.

The possible positions for the study element are S.1, S.2, and S.3.

In positions L.2 and S.2 (guaranteed space) the dweller has 24.66 m² available for use.

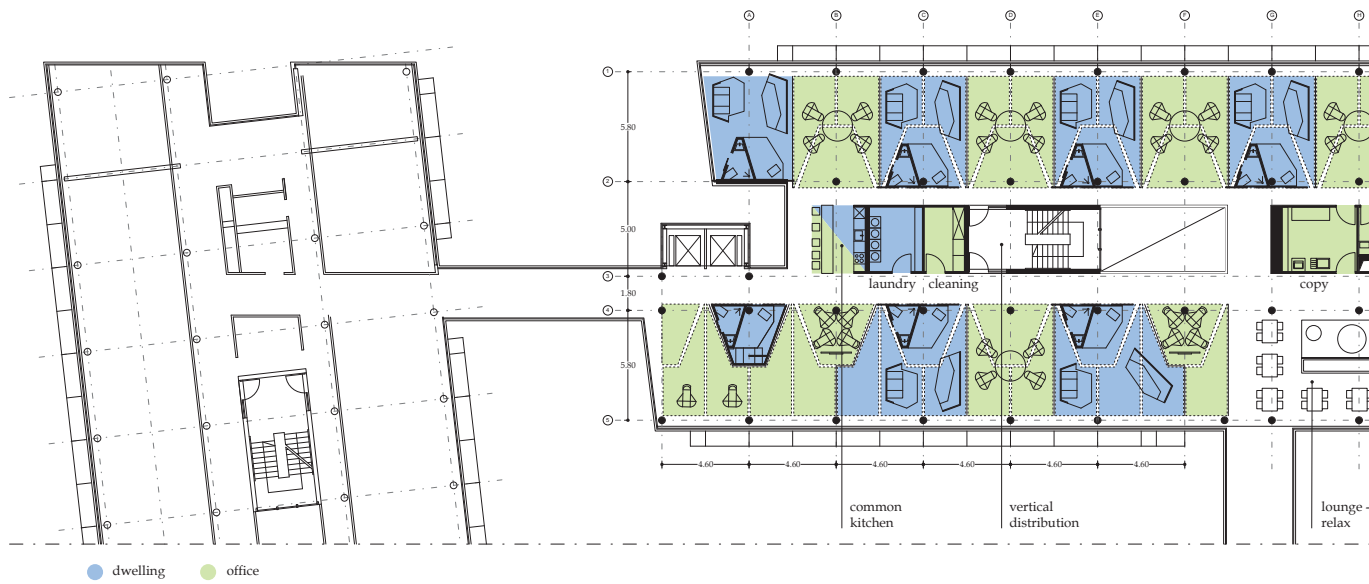
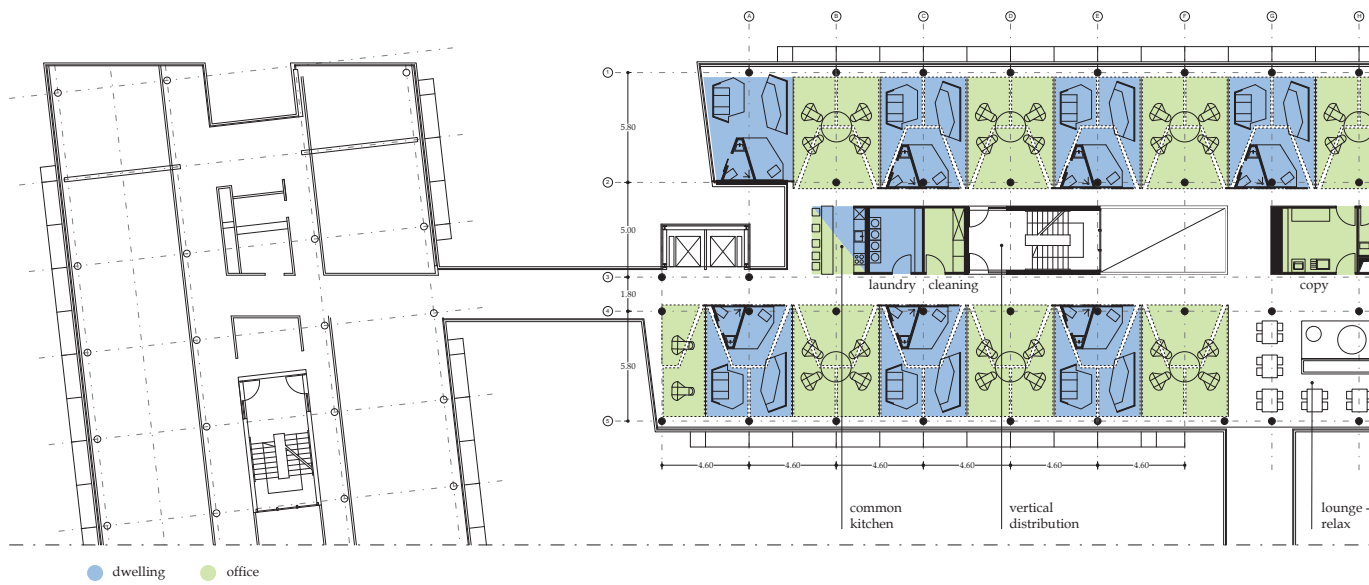
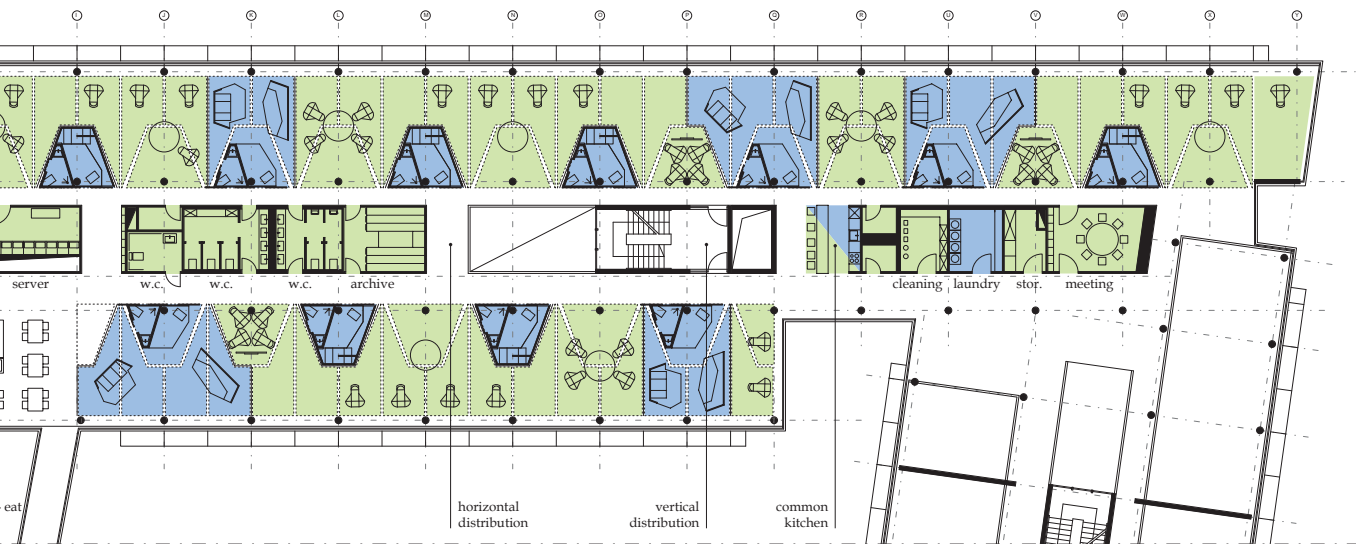


Fig.66
 Case Study Curtain:
 Top: Basis configuration
 Bottom: Spatial configurations to varying presence of users



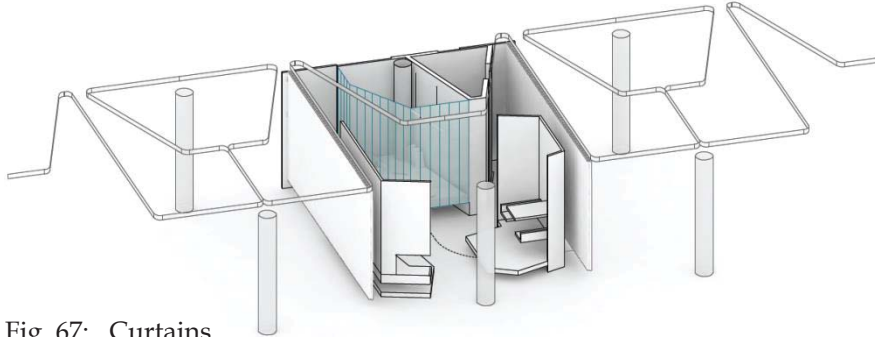


Fig. 67: Curtains
Positions L.2 and S.2 (guaranteed space)

Positions L.3 and S.3 (using expendable space) can be taken either by both or just one of the dynamic pieces of furniture, depending on the direct neighbours on the respective side and whether they declare themselves as not present. In this position the dweller can use an additional 7.80 m^2 on each side, leading to a maximum dwelling size of 40.25 m^2 .

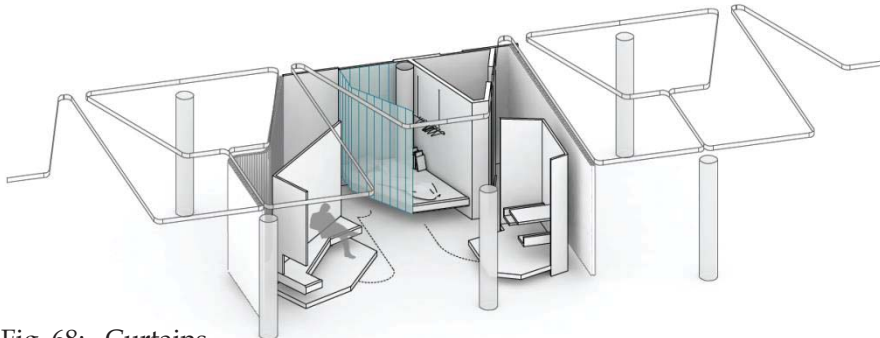


Fig. 68: Curtains
Positions L.3 and S.2 (increased area on one side)

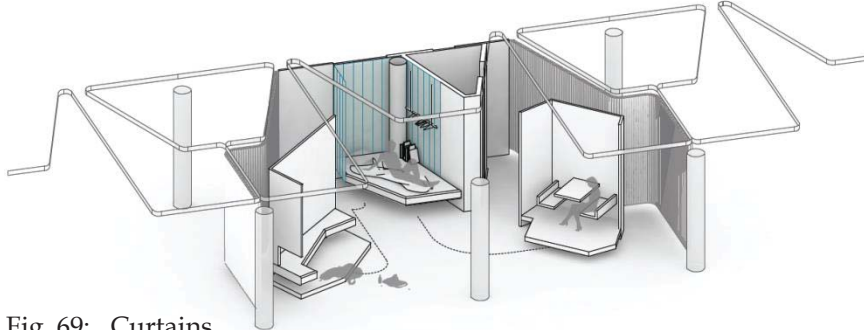


Fig. 69: Curtains
Positions L.3 and S.3 (increased area on both sides)

Positions L.1 and S.1 is the position in the case that the dweller declares himself as not present (either by direct input or by an automated process actuated by a GPS tracker). Then the three pieces of furniture are stuck into each other like a puzzle and become a furniture-container island.

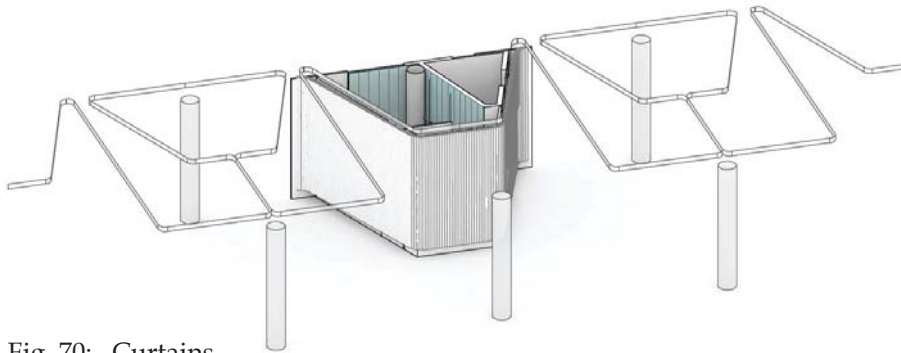


Fig. 70: Curtains
Caption: Positions L.1 and S.1

Offices

The office clusters (four workspaces) use what could be described as a zone rather than a space: the hot-desking (see glossary) concept provides all employees with dynamically movable desk devices on wheels. I call them DDD (Dynamic Desk Device). These DDDs are personalized only on the software not on the hardware level.

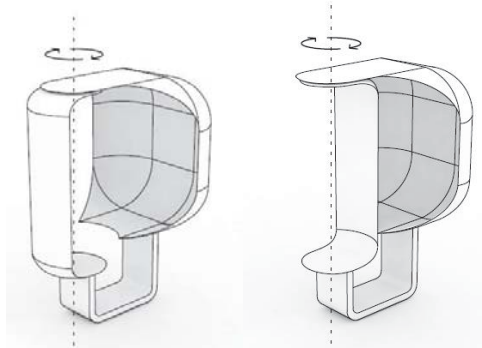


Fig. 71
Dynamic Desk Device (DDD)

The technical description of the DDDs can be found in the appendix.

Four DDDs use an office zone of 24.66 m² in guaranteed space position (Positions D.2). The DDDs can be freely arranged within this zone.

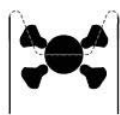


Fig. 72
DDD configuration
in guaranteed space

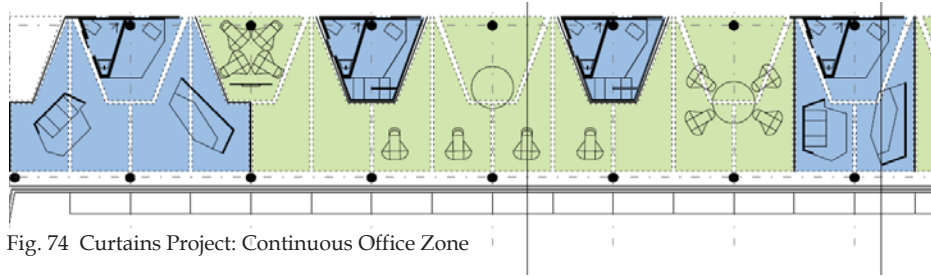
Standard Mode (Guaranteed space)
Office - Meeting Configuration

If a declared absence of neighbouring dwellers means that more space along the windows is available, this can be used by the office employees by moving their DDDs into the free landscape.



Fig. 73
DDD configuration
along windows

Then the office space can be joined with the next neighbouring office unit (behind the dweller) to form a continuous office zone with floating DDDs.



If an office cluster zone is entirely unused (all four employees have declared themselves as not present) then the DDDs form a tight group (position D.1) which covers just 9m² of floor area.



Fig. 75 Curtains Project:
DDDs form a tight group



So far in the case study *Curtain*, the privacy factor has only been solved by the dynamic furniture devices. These do not provide the expected quality of a separating threshold capable of managing issues of sound, privacy and security. This lack of sufficient threshold is solved by a flexible and movable soft wall system similar to a curtain (hence the name for the case study project).

(The technical qualities of the curtain are described in the appendix, here I describe the spatial distribution system.)

The curtain confines the distributed space. It can take different positions along a fixed, installed curtain rail segment. Each rail segment holds one curtain.

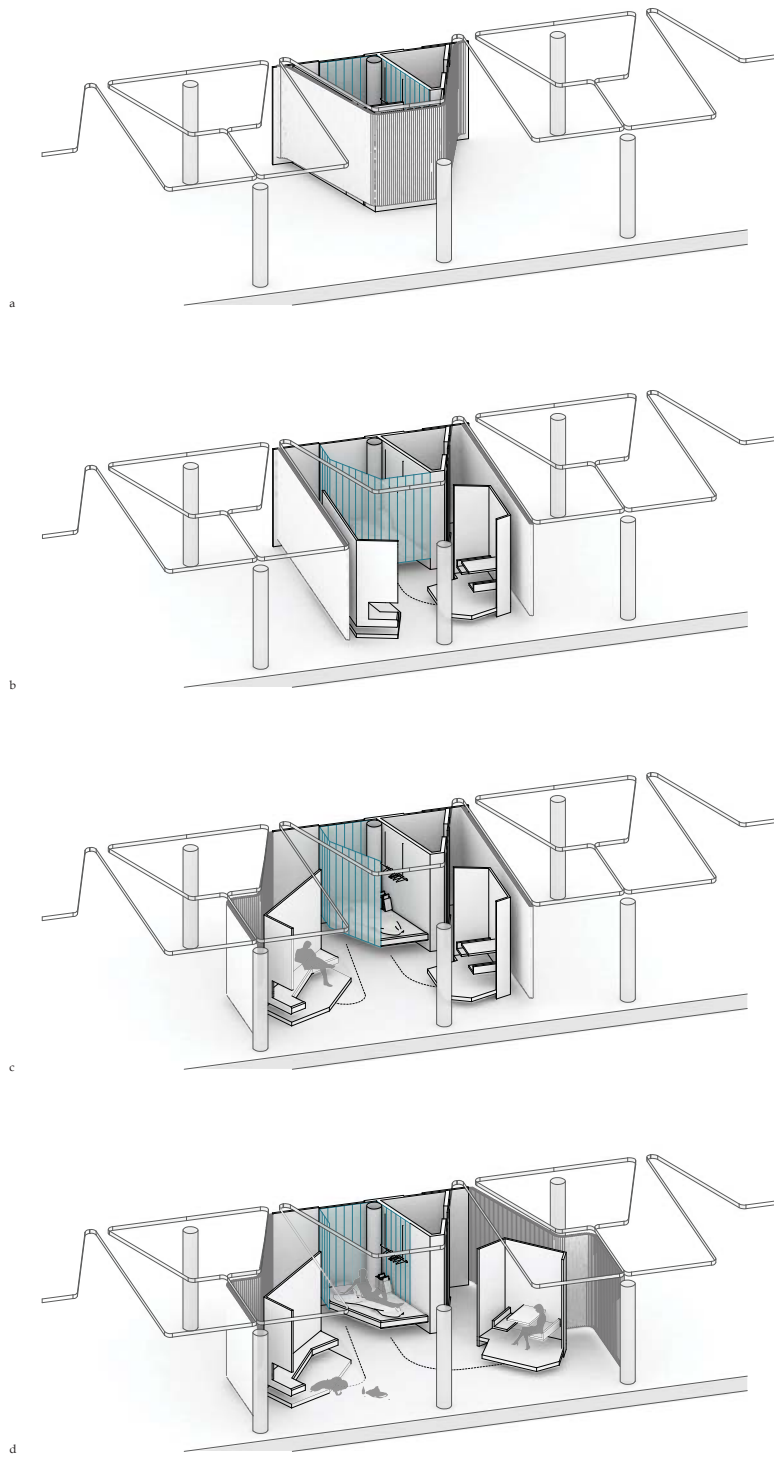


Fig.76
 Case Study Curtain: Dwelling unit and its spatial performance
 a)unused; b) guaranteed space; c) profiting from absent neighbours

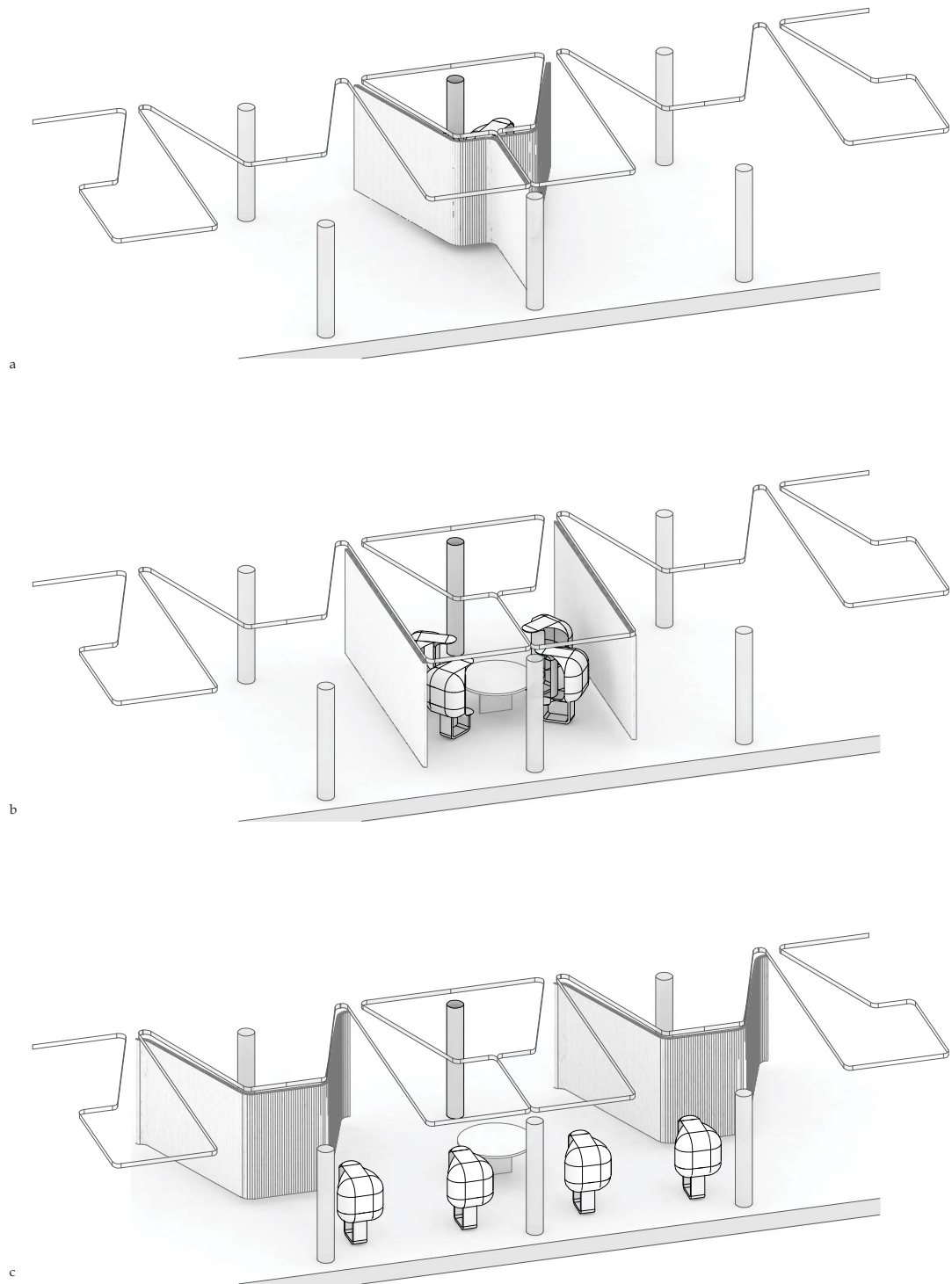


Fig.77
Case Study Curtain: Office unit and its spatial performance
a)unused; b) guaranteed space; c) profiting from absent neighbours

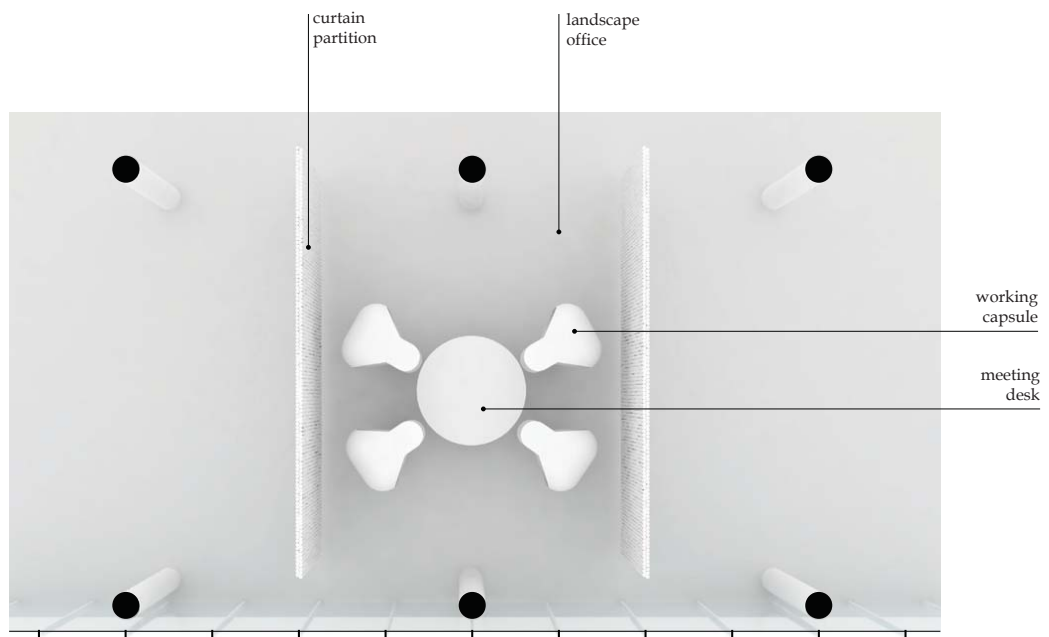
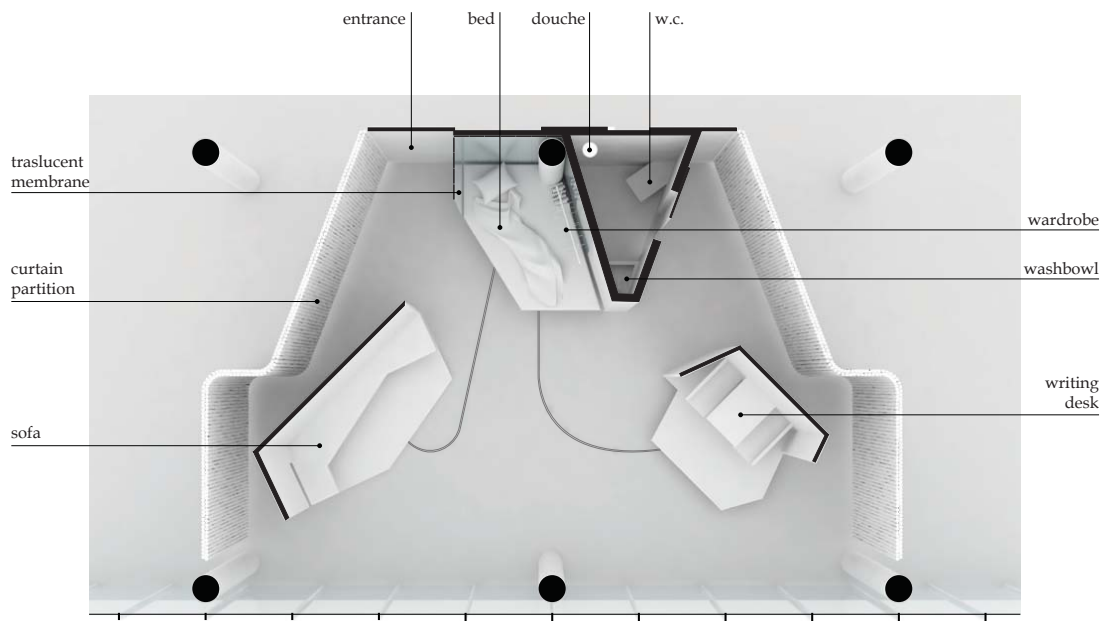


Fig.78
 Case Study Curtain: Plans of the two units
 Top: Dwelling unit
 Bottom: Office unit



Fig.79
Case Study Curtain: Dynamic desk device

One curtain is always allocated as a separation between two users, a dweller and a cluster of employees. This curtain can assume three predefined positions, C1, C2 and C3. These positions and a combination with other curtains cover all relevant spatial configurations.

6.8.2 CURTAIN PROJECT - DISTRIBUTION AND OPERATION

For the distribution and operation there are the following parameters:

- Dwellers: 0 or 1
- Offices: 0 or 1
- Curtain Position: C.1 or C.2 or C.3
- Lounge Position: L.1 or L.2 or L.3
- Study Position: S.1 or S.2 or S.3
- DDDs Position: D.1 or D.2 or D.3

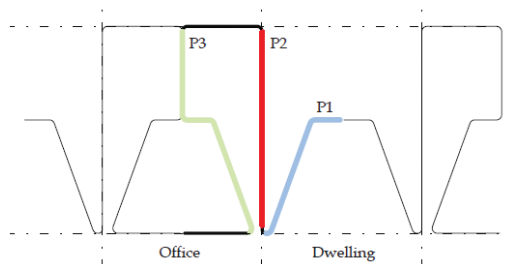


Fig. 80 Different curtains position P1, P2, P3

The positions are computed according to the following matrix: 1 = used; 0 = no one present.

Curtains Operational Matrix

Office value	Dwelling value	DDD's (D) position	Lounge (L) + Study (S) position	Curtain (C) position
1*	1*	D.2	L.2 + S.2	C.2
0	0	D.1	L.1 + S.1	C.1
0	1	D.1	L.3+S.3/L.2+S.3/L.3+S.2**	C.3
1	0	D.3**	L.2 + S.2	C.1

* guaranteed space configuration

** towards the side(s) of the respectively absent neighbour(s)

Fig. 81 Curtains position matrix

6.8.3 CURTAIN PROJECT - OPERATION

A curtain can take the positions C.1, C.2 and C.3; a DDD can take the positions D.1, D.2 and D.3; a Lounge-component can take the positions L.1, L.2 and L.3 and a Study-component can take the positions S.1, S.2 and S.3.

The starting point is the standard distribution of the spaces amongst the participants. A dwelling space is allocated to one dweller and an office space is allocated to four employees (office cluster). In this guaranteed space position all curtains take Position C.2. Like this, each room has 24.66m², be it dwelling or office.

The system distributes expendable space in unused rooms to the adjacent neighbour's rooms, where users are present.

Each room/space gets an assigned value that is either zero or one.

As in *Tracks*, the values are generated depending on the geographical position of the participant(s), measured by smartphones.

The standard value is one (user is present and has at least the guaranteed space size). If any user (dweller or all employees of one office room) is within actuation distance of their space, this value is one. Beyond that distance the value is zero (user not present). The distance could be set to 500 metres¹⁵.

With the application for smartphones all participants always have control over their space and can decide if they participate or not and at which distance their space is distributed to neighbours. If a participant decides not to participate, his/her space maintains the guaranteed size (24.66m²).

¹⁵ The value can be set to any distance preferred by the user

Curtains Operational Matrix

Office value	Dwelling value	DDDs (D) position	Lounge (L) + Study (S) position	Curtain (C) position
0	0	D.1	L.1 + S.1	C.1
1*	1*	D.2	L.2 + S.2	C.2
0	1	D.1	L.3+S.3/L.2+S.3/L.3+S.2	C.3
1	0	D.3**	L.2 + S.2	C.1

* guaranteed space configuration

** towards the side(s) of the respectively absent neighbour(s)

Curtain positions in one rail segment

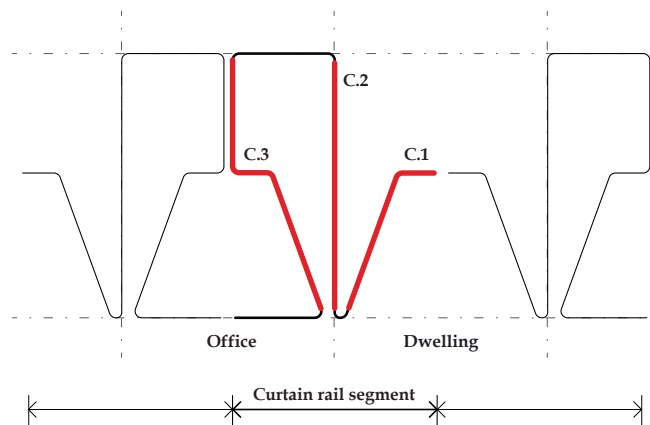


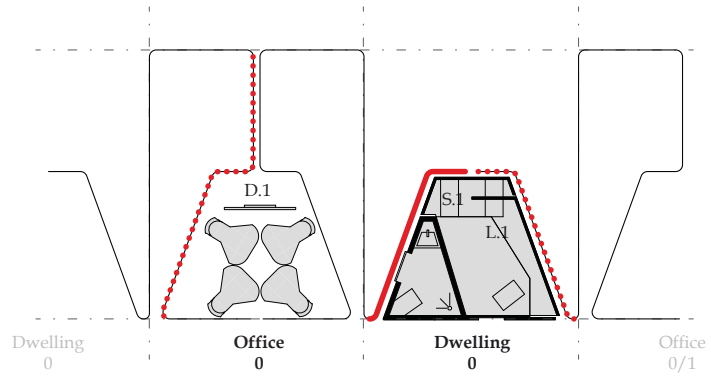
Fig.82

Case Study Curtain:

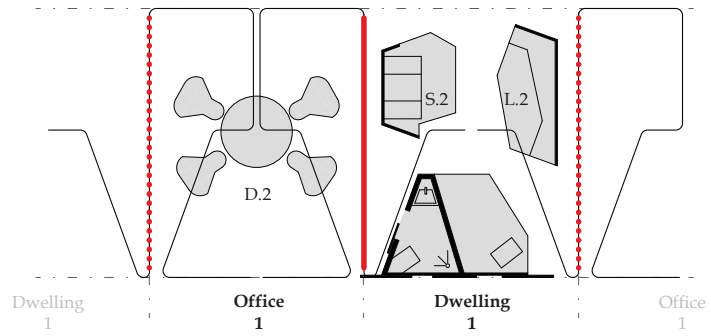
Top: Operational matrix

Bottom: Positioning of the dynamic elements according to all possible combinations of two neighbouring spatial units

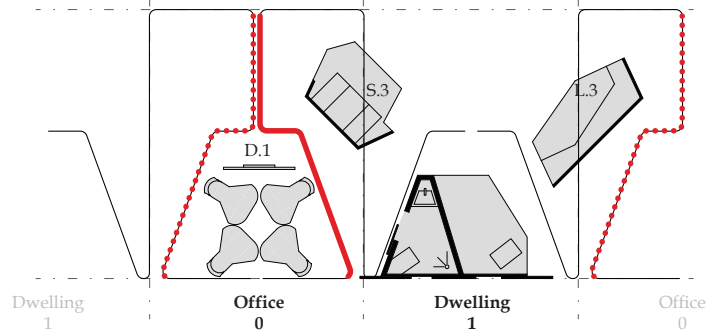
Curtain position C.1



Curtain position C.2



Curtain position C.3



Curtain position C.1

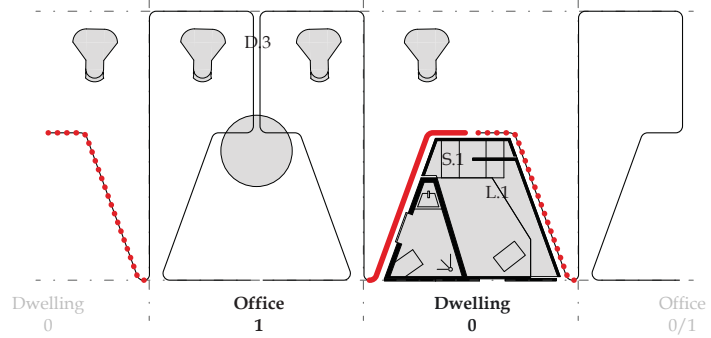


Fig.83
Case Study Curtain: Positioning of the dynamic elements according to all possible combinations of two neighbouring spatial units (1 = used; 0 = unused)

The operation of the space follows similar patterns to the track project but in two different processes:

- The floating dynamic elements (DDD's and the two dwelling platforms) move gradually with a predefined speed.
- The curtain changes position along the track and configures spatial connections and separations. The distribution does not happen gradually. Space is either allocated or not.

The changes follow a predefined order of successions, which is described in the appendix.

CURTAINTRACKS
SYSTEM

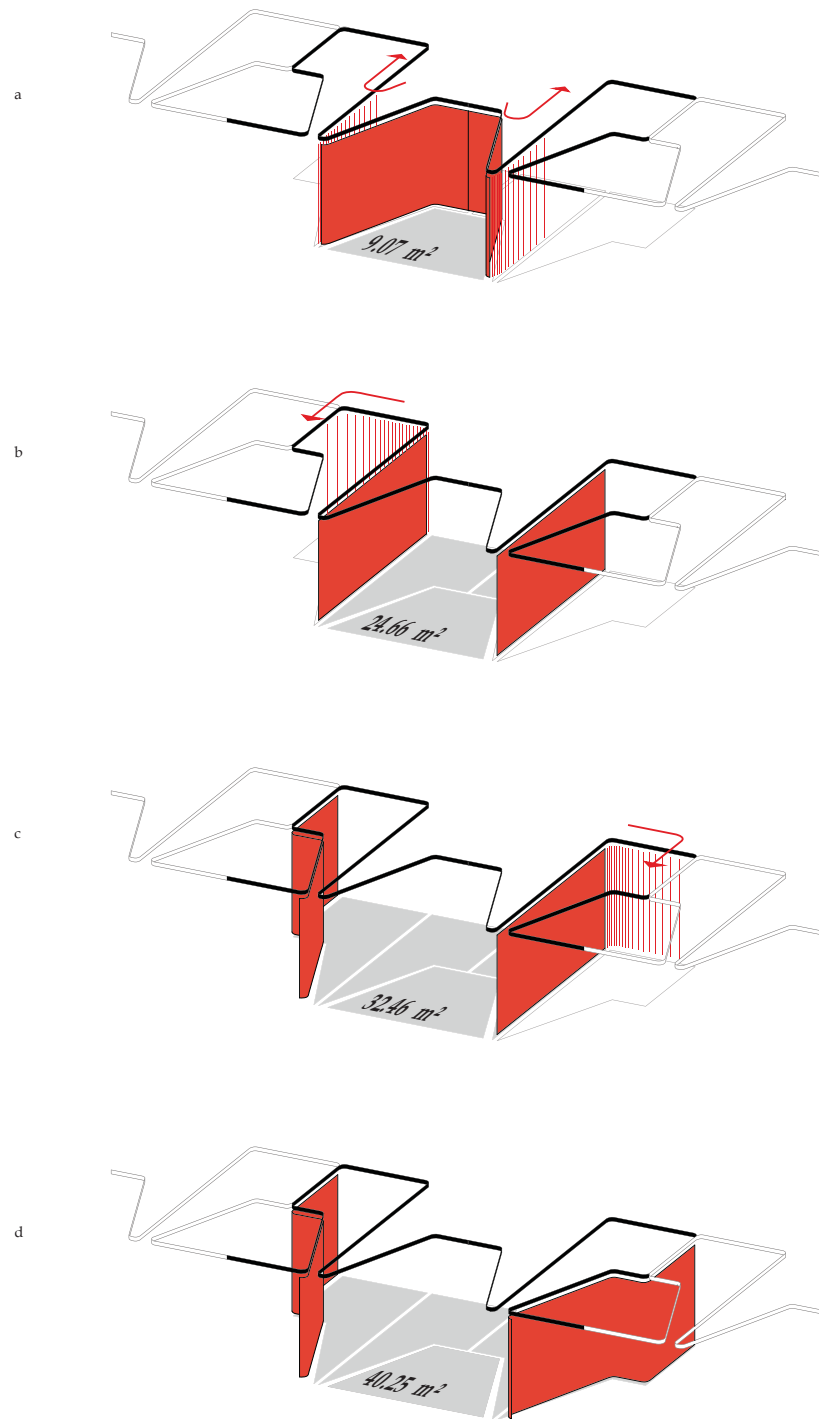


Fig.84
Case Study Curtain: Varying spatial configurations according to the positioning of the curtains;
a) unused; b) guaranteed size; c) gaining space from left neighbour;
d) gaining space from left and right neighbour

6.8.4 CURTAIN PROJECT - PERFORMANCE SIMULATION RESULTS

The simulation framework is the same as described in chapter 6.4 with regard to method, observed areas, selected spreadsheets of use and simulation setup. However, a different computer script has been used to generate the simulation.

The simulation has been captured with two different media, a diagram and an animated movie.

The diagram visualises the spatial performance of every single spatial entity and provides room sizes' performance over the course of one day, captured every half hour. The rows represent the half-hour steps and show where each room is at a specific time of the day, e.g. at 14:30. Blue areas are dwelling areas and green areas are office areas. The areas represented in the diagram reflect the real proportions of the areas.

The diagram delivers the following information:

General observations for the simulated day:

- At no time are all spaces used.
- The smallest size of any used space is 24.66 m² which is also the guaranteed space size.
- The biggest size of any used space is 40.25 m² resulting in a spatial difference of 15.59 m² from the guaranteed size of 24.66 m². The resulting growth factor is 163%.

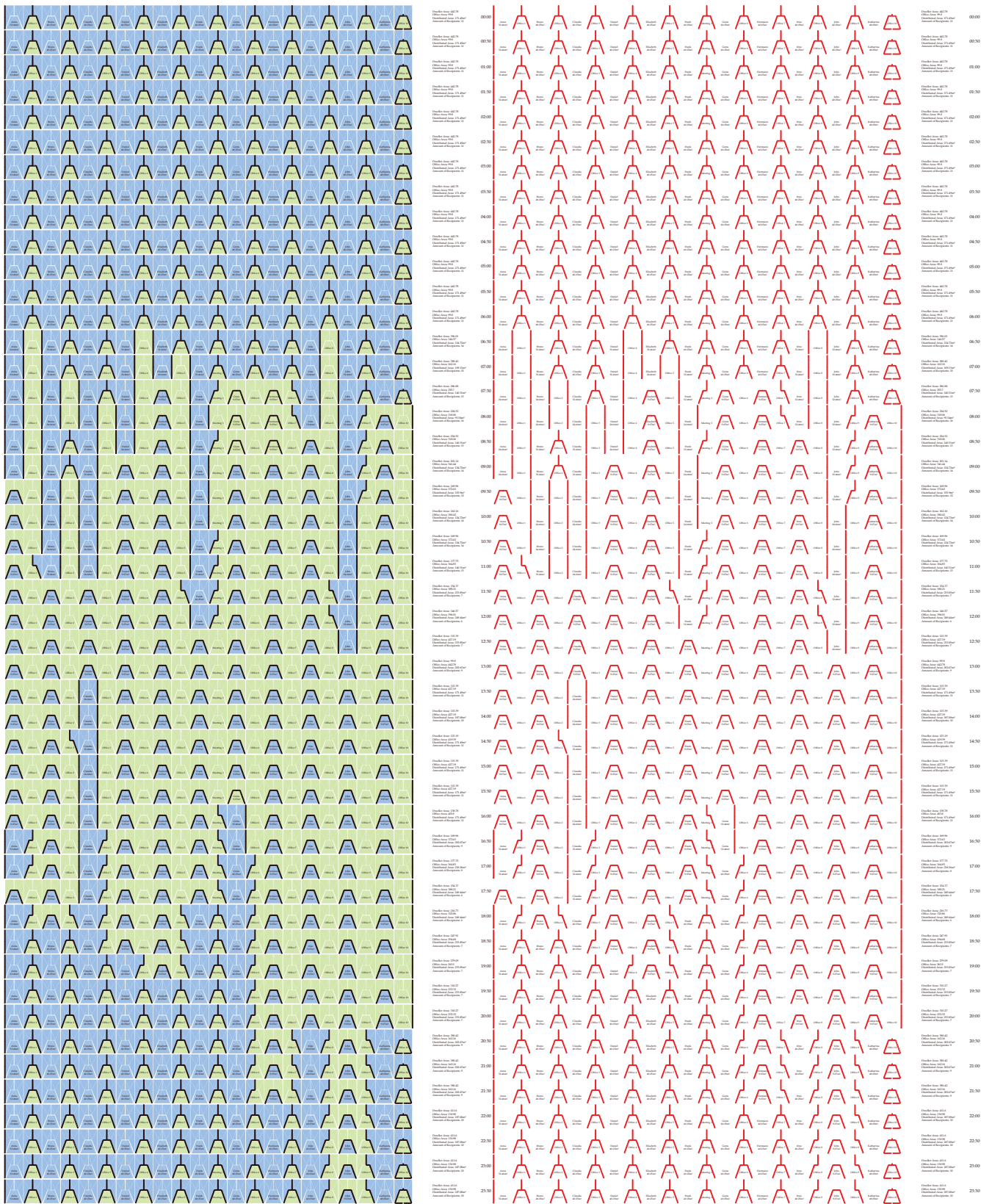


Fig.85 Case Study Curtain: Record of the dynamic performance over 24 hours (48 times 30 minutes) and their spatial representation and performance of space dividing thresholds (right)

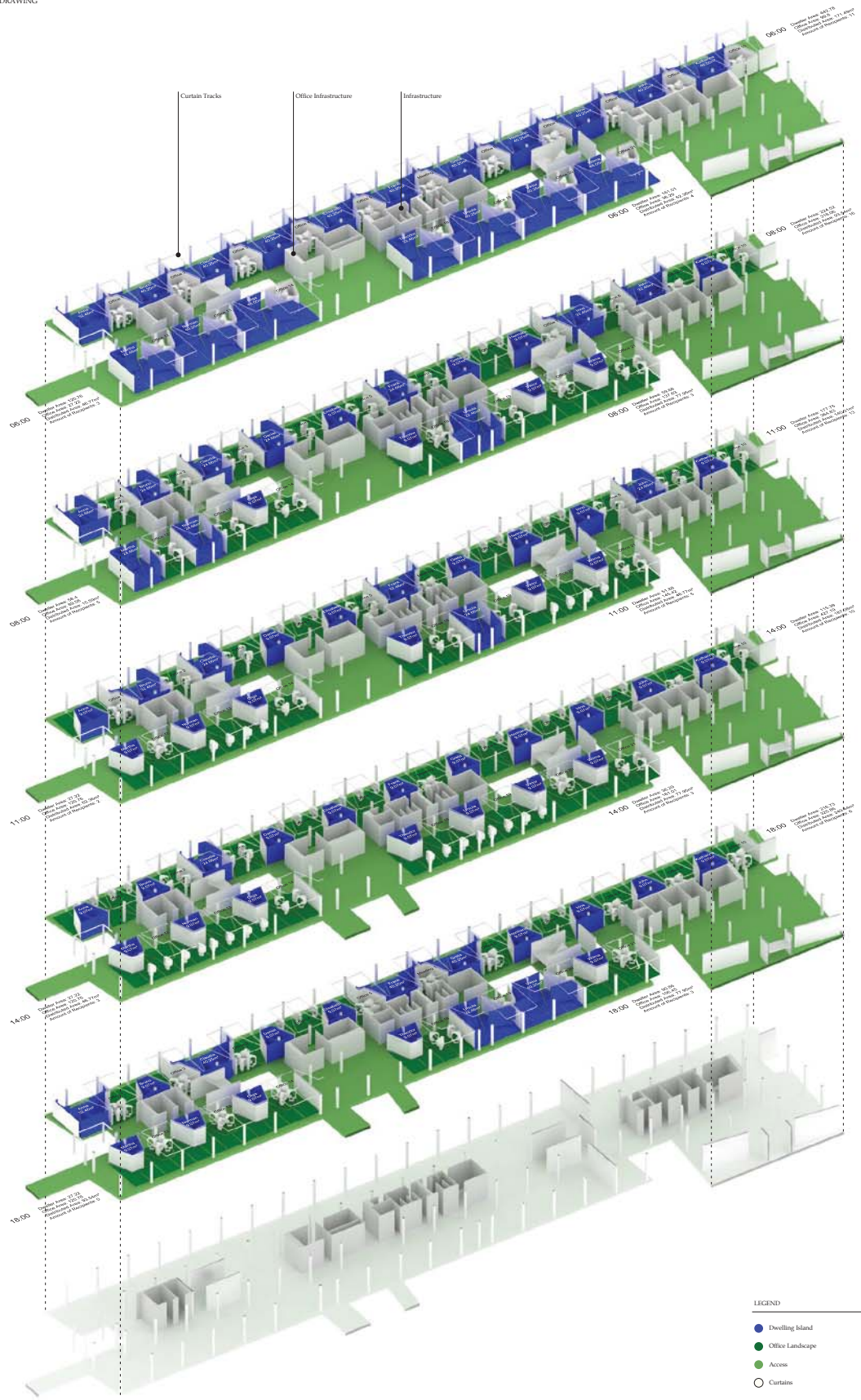
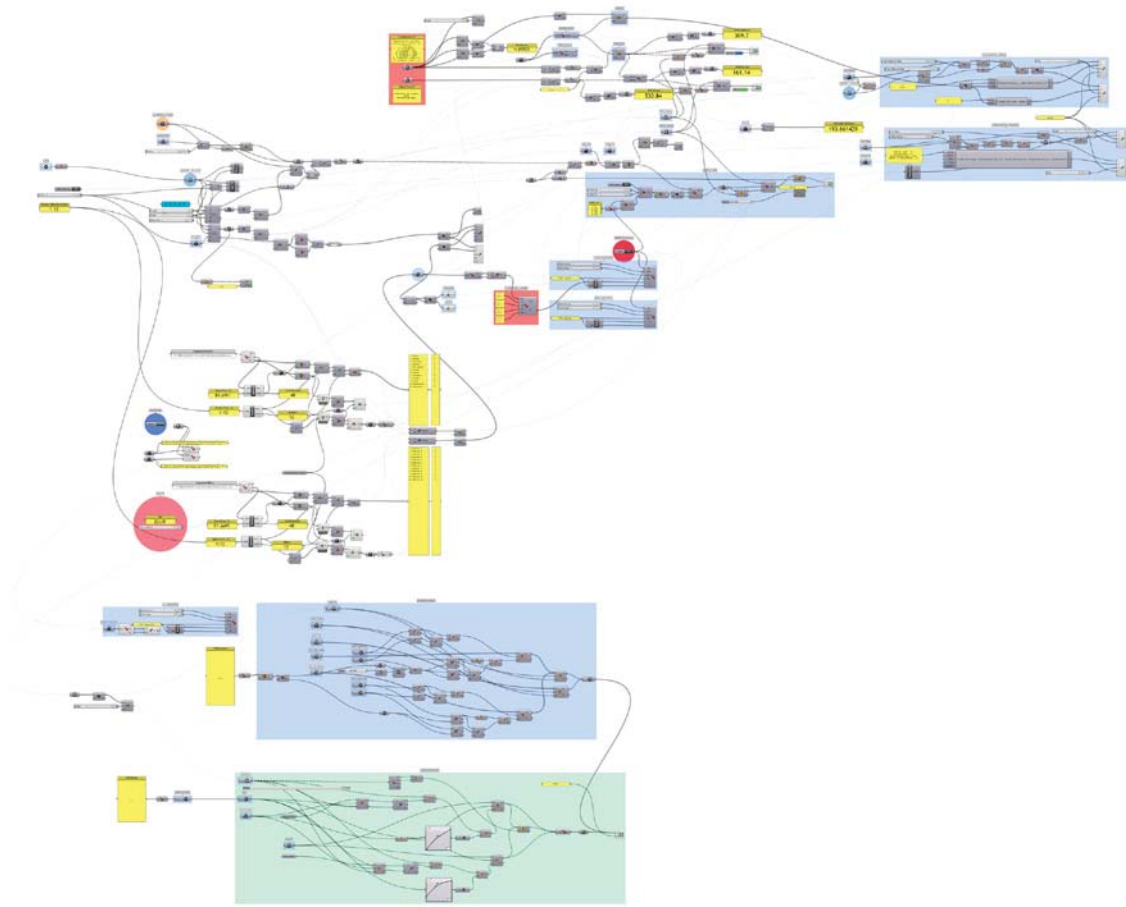


Fig.86
Case Study Curtain: One storey captured at different times of the day:
Top to bottom: 6:00 h, 8:00 h, 11:00 h, 14:00 h, 18:00 h



CURTAIN PERFORMANCE

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Number of shading devices	0	0	0	0	0	0	0	0	0	0	0	0	0
Average shading efficiency	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of office occupants	0	0	0	0	0	0	0	0	0	0	0	0	0
Average office occupancy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Shading equipment cost per sq. ft.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Office equipment cost per sq. ft.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Number of shading devices	144
Average shading efficiency	0.00
Number of office occupants	0
Average office occupancy	0.00
Shading equipment cost per sq. ft.	0.00
Office equipment cost per sq. ft.	0.00

Fig.87 Case Study: Curtain: Performance analysis and Grasshopper skript

Dwelling observations:

- During the average use time of the dwellings of 14.68 hours, the dwelling spaces had an average size of 38.20 m².
- The used dwelling spaces provided a total of 420.18 m² dwelling space to the 11 dwellers. This is 154.90% of the guaranteed size of 271.26 m² and represents a gained area of 149.92 m².

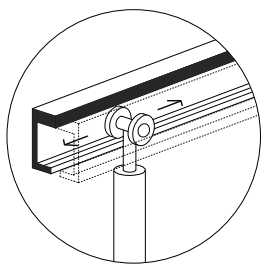
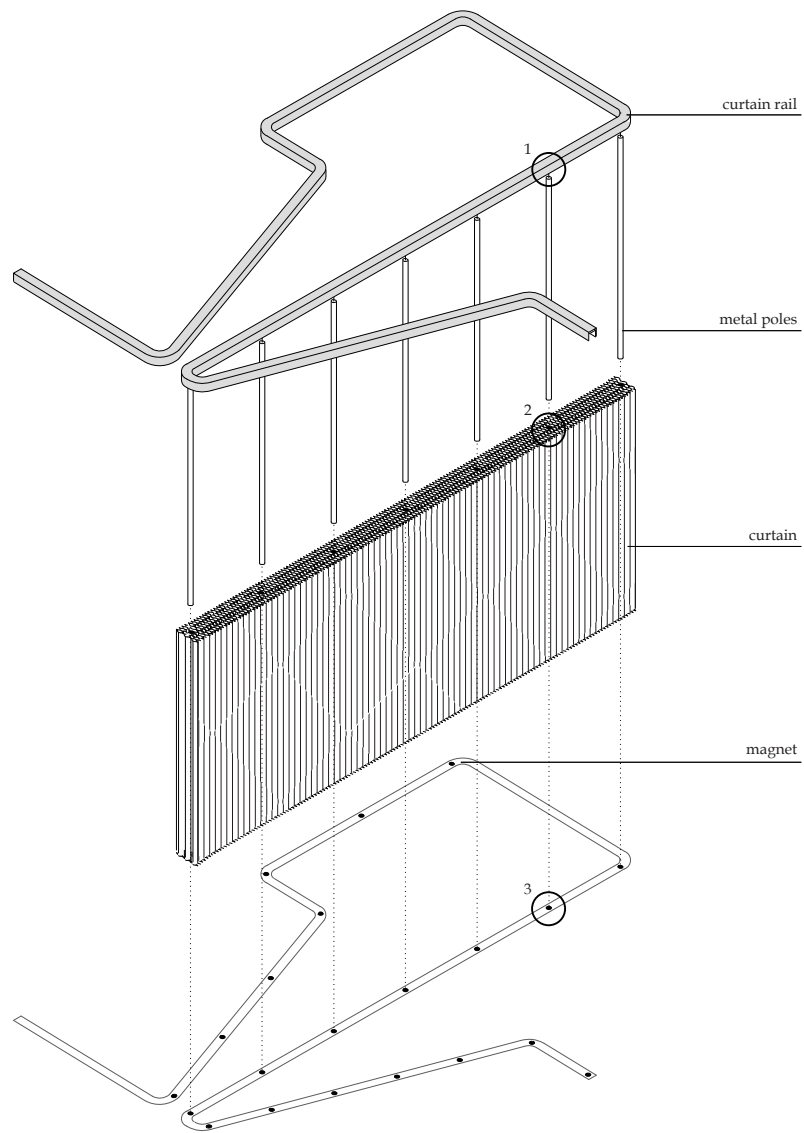
Office observations:

- During the average use time of the offices of 8.70 hours, the office spaces had an average size of 45.84 m².
- The used office spaces provided a total of 458.37 m² office space to the 11 x 4 employees. This is 185.88 % of the guaranteed size of 281.26 m² and represents a gained area of 187.11 m²

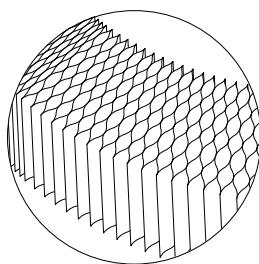
The animated movie was made to give a visual impression of how the spaces physically change over the course of one day. The movie shows the Tracks project from the previous chapter and the Curtain project¹⁶.

A description of the technical components of the Curtain project can be found in the appendix.

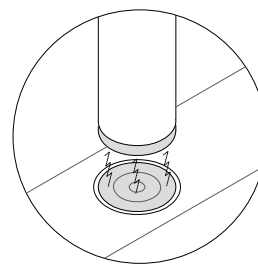
¹⁶ To be viewed on the internet at this address: <https://vimeo.com/105620841>
The password is: f9Fqj8



1 Moving structure along rail segment



2 Open cells of the curtain



3 Hidden magnets to fix wall structure

Fig.88
Case Study Curtain: Technical components of one curtain system

6.9 TRACKS AND CURTAIN PROJECTS: CONCLUSION

The main aims/objectives addressed in this chapter were:

- Could the combination of work and living result in space increase when users are present?
- How could the operational control of the building be organized?
- Which spatial configurations could support the idea?
- Technically, which concepts could be applied for changing spatial configurations and for the moveable elements?

In this conclusion I answer these questions by analysing, comparing and evaluating the results of both projects *Tracks* and *Curtain*. This evaluation is done through different criteria.

Both projects are based on the affirmation that 'one person can only be at one place at one time'. (This makes it irrelevant what happens when one is out of the house.)

The aims listed have been attempted in a real urban context by applying a plug-in process that filled up the temporarily expendable physical space of an existing building and programme with a secondary, complementing programme.

Baureferat in Munich with the programme administration building was defined as suitable building for the real context application of the concept. The plugin complementing programme was defined as dwellings for one-person households for users in the age between 20 and 40.

6.9.1 LINKS TO PREVIOUS CHAPTERS

The design of the case studies is informed by the architectural references and by the social, cultural and technological context outlined in chapters 2 and 3.

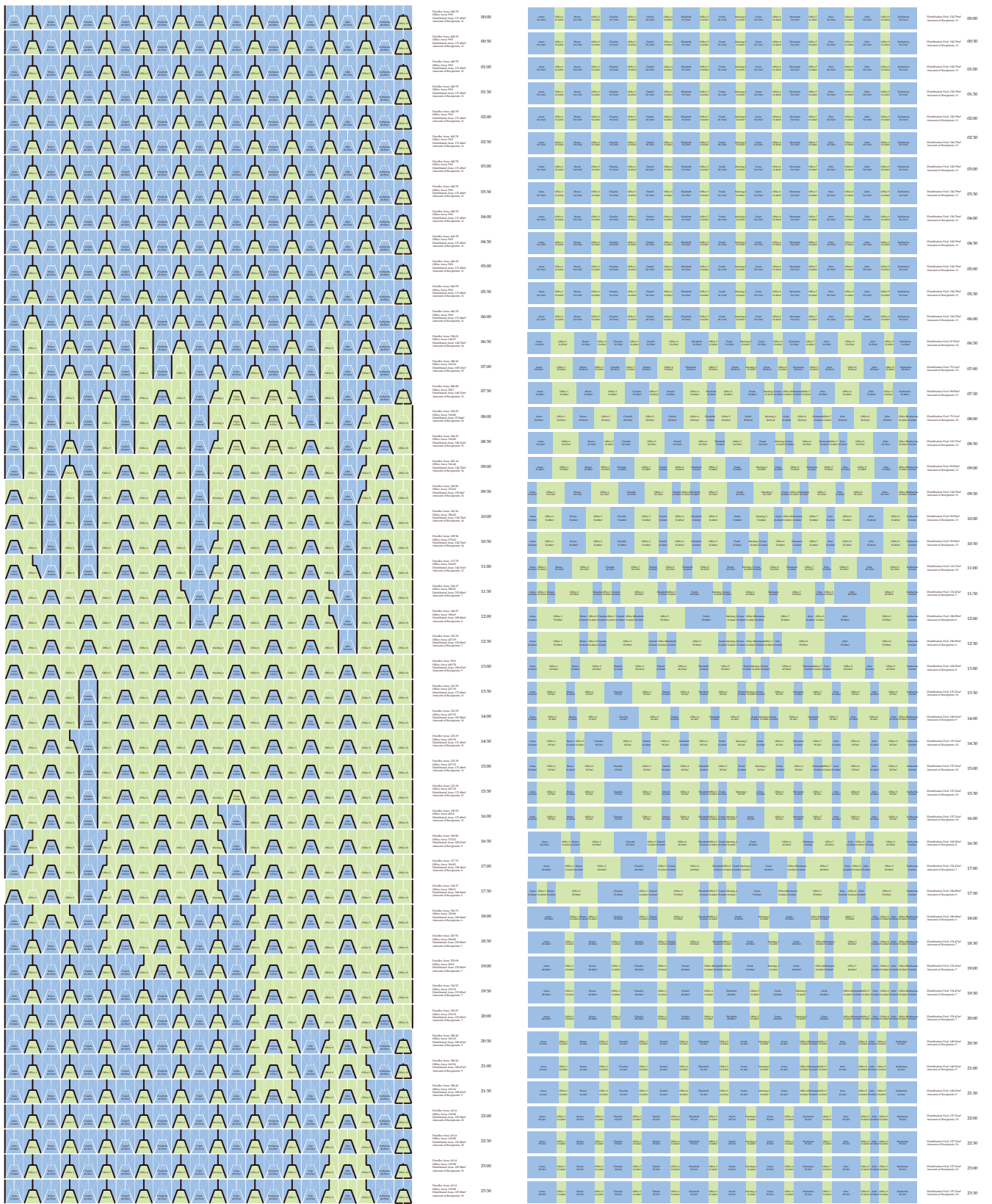


Fig.89 Case Studies Curtain (left) and Tracks (right): Comparison of the dynamic performance over 24 hours (48 times 30 minutes)

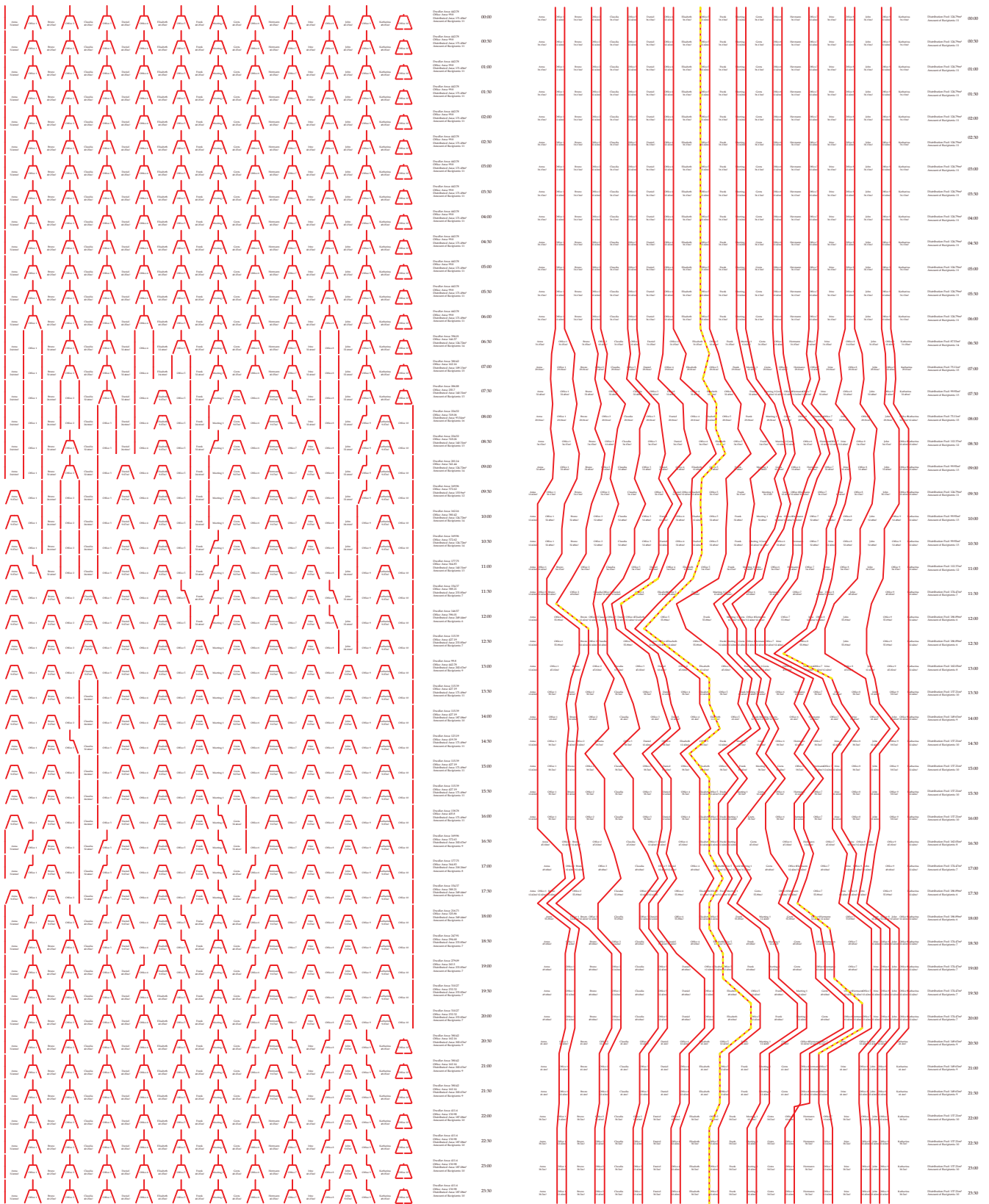


Fig.90
Case Studies Curtain (left) and Tracks (right): Comparison of the performance of space dividing thresholds

The most relevant links to mention are the relation to Cedric Price who, in his work, emphasizes the participation of the user in the configuration of the architectural elements, enhanced by the contribution of J. and J. Frazer, who gave intelligence to every single architectural component, communicating with each other. However, it is the concept of distribution and allocation and not the design of the physical components that I draw from. A similar setting is proposed here, though the movements of building components are actuated by the participants' geo-position, sensed by smart mobile devices. This setting would also allow for an evolutionary process to identify optimised settings which have not been carried out in the case-studies as it would have gone beyond the scope of this thesis.

Smart mobile devices were identified in chapter 3 as one of the catalysts for the sharing economy, which the case-studies projects can be assigned to. The rival good space gets distributed and this process is possible by the distribution of the non-rival good information, in a process similar to the one used by car-sharing systems.

The research conducted in chapter 4 not only provided testing data for the case-studies simulation, but also the graphical representations and diagramming triggered the indenting, interwoven and interpenetrating spatial arrangements. These were conducted in both the elastic architecture project and in the case-studies.

In Elastic Architecture I rehearsed a system of distribution of space. It led me to the conclusion that in order to implement reactive behaviour, it was necessary to program the structure, like a software. This was crucial information to develop the case-studies.

6.9.2 PERFORMANCE – QUANTITY OF SPACE

The main argument of the whole research is the potential space gain of the concept of complementing use. Responding to the first question of this chapter the results were unexpected in a positive way. In terms of performance of the quantity of space available to each spatial entity, both *Tracks* and *Curtain* delivered an increase of about 50% of space additional to the guaranteed space.

The argument for space is a constant in our society. In urban contexts flats and rooms are increasingly smaller proportional to the price paid. In the study 'The Case for Space: the size of England's new homes' conducted by the Royal Institute of British Architects in 2011, one of the main concerns of respondents was that 'rooms were too small'¹⁷.

The two proposed spatial and operational concepts provide access to additional space. The overall performance figures of both projects are in a similar range (all above 50% of additional space). Although the *Tracks* system benefits from a bigger group of space providers (up to 20 at the same time) it still cannot beat *Curtain* (max. two providers at the same time). This is due to the fact that the collapsed spatial entities in *Curtain* (9.07sqm) are smaller than in *Tracks* (12.42sqm). Therefore the distributable space per spatial entity in *Curtain* is bigger by 3.35 sqm.

The observation that the more people simultaneously present in the building the less space each has, can be regarded as a potential limitation.

However, the starting point for the design of the distribution system of space was the basis configuration (see chapter 6.7.1) which is also the worst-case configuration. In the basis configuration all users (dwellers and employees) are simultaneously in the building. Then all spaces have the

¹⁷ 'CaseforSpace.pdf', p. 8
<<http://www.architecture.com/Files/RIBAHoldings/PolicyAndInternationalRelations/HomeWise/CaseforSpace.pdf>> [accessed 1 September 2014].

guaranteed size, which is also the defined size potential tenants/buyers can acquire¹⁸.

Also, the user groups were identified in such a way that the simultaneous presence of all users is avoided as far as possible, as they use the building at different times of the day or of the week. There is the theoretically possible but unlikely event of all users being present (according to the data this would happen during daytime of a weekday). Then all users have their own assured guaranteed space.

With each user leaving the building, remaining users profit from the absence of other users as their spaces grow beyond the guaranteed size. The solutions tested also allow them to benefit from different spatial configurations and sizes of spaces built into the system of tracks and curtains.

For example in the case study tracks, dwellers could arrange between themselves to shrink certain dwelling units and to enlarge one of them to make space for common social activities, like parties or other events.

The proposed system of space distribution is based on the voluntary provision of unused space for other users. The possible gain of additional (provided/donated) space from others can be regarded as a motivation to also provide one's own unused space when one is not in the building.

Users have been suggested for their predisposition towards a sharing culture as well as their rather 'flexible' lifestyle. Their incentive to join this scheme is the desire for a larger space than the guaranteed size. In a press release by the Bundesinstitut für Bevölkerungsforschung (Federal Institute for Population Research) dated September 2013 it is stated that the living space per capita in Germany grew from an average 39m² in 1998 to 45m² in

¹⁸ For more on scenarios of ownership details please see Appendix A.6.1 - Management Structures and Forms of Ownership for the proposed Case Studies

2013 due to increased demand for larger areas and due to the increasing amount of one- and two-person households¹⁹.

The project should be understood as a response to such societal trends. Again, the emphasis of the research is rather on the technical and structural transformation that housing or office complexes should undertake to maximise the use of physical space.

6.9.3 ARCHITECTURAL QUALITY OF SPACE - INTERIOR

Curtain's spatial concept follows the principle of growing and shrinking personal spheres represented in islands of unused and collapsed spatial entities. For the offices this means that the more dwellers are away the more the office rooms mutate into an office landscape. Vice versa, direct dwelling neighbours have the choice to combine their rooms into a big continuous space with a collapsed office inside; or to stay individually apart. The dwelling has different levels of protected privacy. The bed compartment corresponds to the highest degree of privacy, like a cocoon. Study and lounge are more public, i.e. less protected. This is an onion skin principle where different shells enclose the inside.

Tracks advocates a 'praise of the wall'²⁰ and of insulation. The dividing elements are walls, thus assuring a high level of privacy and division between the different spatial entities and programmes. The indented arrangement even emphasizes this. The direct neighbour is regularly out of the building and his furniture container works like a buffer to the next neighbour of the same programme. This is regarded as a quality.

¹⁹ '2013_07_pro_kopf_wohnflaeche.pdf' <http://www.bib-demografie.de/SharedDocs/Publikationen/DE/Download/Grafik_des_Monats/2013_07_pro_kopf_wohnflaeche.pdf?__blob=publicationFile&v=3> [accessed 10 May 2015].

²⁰ Peter Sloterdijk, 'Architekten machen nicht anderes als In-Theorie.', *ARCH+*, *Zeitschrift für Architektur und Städtebau*, Architekturen des Schaums, 169/170 (2004), 16-23 (p. 22).

The two approaches have profoundly different spatial configurations and also promote different lifestyles: *Tracks* is a system of individual living and working in one's own room, the curtain proposal offers possibilities to merge smaller rooms into bigger and continuous spatial entities.

6.9.4 OPERATIONAL QUALITIES SPATIAL ENTITIES

The bottom-up approach of both systems changes the role from the 'applicant for space' to the role of 'donator of space'. The guaranteed space principle makes every participant a winner of space. This is regarded as an important factor. The proposed system of giving can be characterized as a system of solidarity.

However, what, if you are at home and your flat shrinks? This event occurs only to participants who previously benefited from additional 'donated' space. It's not a must, it's an option. I envision that in more complex simulations (outside the scope of this research) user-routines that minimise disruption will evolve.

6.9.5 PATTERNS OF USE

During the night and presumably at weekends, when the offices are unused, the system operates steadily. During working hours there are many changes in the spatial configuration. This could be regarded as distracting. This could be solved by the participants of the system who could keep their room size constant during transition phases, if desired. Dwellers can also reduce their dwelling in the evenings before work days to their guaranteed size in order to avoid surprise in the mornings.

6.9.6 ROLE OF USER

Referring to the role of the user in configuring the system, there is always the option to say no to change. If dwellers of office employees do not wish for its space to change, they do not need to donate space, however they would also not be allowed to profit in an envisioned 'reward' system. In terms of control there is a mix. Is the control top-down or bottom-up and where ends the power of the end user? To call the user the designer would be wrong. However its presence triggers the operational system. So it is user-reactive, but the possible design positions are predetermined by the specific set of circumstances.

6.9.7 ROLE OF OWNERS / PROVIDERS

The operation of the proposed building includes the handling and processing of sensitive and private information. To keep all participants' private data protected, a solution could be devised through the development of a code of conduct. These important issues of privacy and trust would need to be addressed in depth in any further work.²¹

6.9.8 EVOLUTIONARY EVALUATION

Both systems are fully behaviour driven and real-time adaptive. However, the proposed distribution system is still in an early stage. If more simulations and user-based experiments were carried out, the software component of the projects could even get an evolutionary character and benefit from algorithms used for modern smart grids (see glossary) however that was not the aim for this specific research.

²¹ Please see Appendix A.6.1 - Management Structures and Forms of Ownership for the proposed Case Studies

In *Curtain* there is a strong dependency of the immediate neighbours, since the participants can only benefit from their two physically adjacent neighbours. Also there is no soft transition. Either an entity is on or off, meaning in each of the predefined positions. In *Curtain* there is a bigger personal dependency on the decisions of the donating neighbour.

The research reveals for both systems that the dwellers are profiting more than the administration officers. They profit from reliable and strict office hours. Vice versa the routines of the dwellers could change every day.

6.9.9 SIMPLICITY

An advantage of the two systems is their **simplicity**. They reveal the potential that they could be implanted into any standard office building, using existing technologies. All changes of spatial configurations are based on linear movements of the components. Atmospheric diversity is created by little physical interventions revealing a variety of spatial configurations.

6.9.10 OTHER BENEFITS/ECONOMIC & ECOLOGICAL POTENTIAL

One can conclude potential economical savings. From an **investment point of view**, the proposed building with all its mechanical components is more expensive in the initial investment but in the long-term contains several benefits: There are savings in building infrastructure, in its erection, in its maintenance and in running costs. Several services can be shared in a 24-hour-use cycle that in a 12-hour system would need to be double. Also there is the benefit of not needing to cover another piece of land since the considered site is an existing building.

In terms of **ecological advantages** like heat-saving, in both projects the envelope is used twice as much as in the current status of the building. This

induces a saving in the volume of heated air. For this project this factor is only a side benefit.

6.10 CHAPTER'S FINAL NOTE

What was most striking and surprising was the performance of the proposed projects in terms of increase of space when the user is present. The conclusion was that at all times of the simulation the individual spatial entities were bigger than the guaranteed space. In the evenings there is a big gain for dwellers. The simulation did not include weekends since the simultaneity of the two programmes would be reduced. One can induce that the results in favour of the dwellers would even be more convincing at weekends resulting in an even higher space gain for the dwellers.

An additional conclusion is that despite their different approaches of distribution, there was a similar performance in both projects.

7 CONCLUSION

7.1 CONCLUSIONS INITIAL NOTE

7.2 CONCLUSION CHAPTER CONTEXT ARCHITECTURE

7.3 CONCLUSION CHAPTER CONTEXT CULTURE SOCIETY

7.4 CONCLUSION CHAPTER PATTERNS OF USE , USER
IDENTIFICATION, CONTROL

7.5 CONCLUSION ELASTIC ARCHITECTURE

7.6 CONCLUSION CASE STUDIES TRACKS AND CURTAIN

7.7 OVERALL CONCLUSIONS

7.8 CRITICAL STATEMENTS

7.9 FURTHER RESEARCH AND DEVELOPMENTS

7.1 CONCLUSIONS INITIAL NOTE

I will give an account of what I concluded in each chapter followed by an overall conclusion of the whole thesis and an outlook to the future.

7.2 CONCLUSION CHAPTER CONTEXT ARCHITECTURE

In this chapter I have given an account of specific examples on the topics of flexibility and adaptability. I concluded that my work falls into Adrian Forty's categorisation 'flexibility by technical means'. I also explored briefly the topics of participation and evolutionary cybernetic principles. In the sense of participation I concluded that my work is informed by participation by presence. The introduction of the computer in architectural evolutionary projects was relevant since it was an emblematic example of the roots of interactive architecture. All of this constituted a targeted literature review that informed the design research and helped to categorise it in the first phase.

7.3 CONCLUSION CHAPTER CONTEXT CULTURE SOCIETY

In this chapter I explored how current technology supports a form of sharing and distribution of space. Responding to the relationship between the research question and contemporary technology I concluded that, through the generalisation of smart mobile devices and software applications for these (apps), there is a direct connection between ubiquitous computing and new forms of sharing, and therefore that new technologies allow new real-time distribution systems.

I outlined what sharing in the context of my research means, which is making space available according to presence, allowing a redistribution of unused space. I concluded that at home or in the workspace there should be a guaranteed space for the user when she or he is present.

It was relevant to analyze the topic of possessions in contemporary society, since the home or the workspace is a container of possessions (objects and furniture) even when one is absent. I concluded that there are emergent behaviours that challenge the tendency towards more possessions.

I realised that there is a multiplicity of thresholds, in the sense of separations of space, that could be used in order to divide programmes and activities and to preserve the ownership of a specific space, which was an important point to be tested in the design.

7.4 CONCLUSION CHAPTER PATTERNS OF USE , USER IDENTIFICATION, CONTROL

In this chapter, supported data extracted from surveys and interviews, I identified users and activities of my intended building. The users are dwellers in one-person households in the age group of 20-40 and the complementing programme to dwelling is administration offices.

7.5 CONCLUSION ELASTIC ARCHITECTURE

In the Elastic Architecture Chapter I developed a model of distribution of space, through geometrical and algorithmic exercises. The proposed structure resulted in two entangled landscapes, potentially an office and a living landscape in a hybrid building. I incorporated the factor of time and transformed it into a three-dimensionally changing spatial entity, with controlled patterns of use. As a result, I concluded that the selected method of distributing space amongst mutually impacting spatial entities, (according to their mutually oscillating degrees of use) arranged in the selected bicontinuous structure, leads to strong deformations of the space-dividing thresholds.

7.6 CONCLUSION CASE STUDIES TRACKS AND CURTAIN

In the Chapter Case Studies I developed two models of distribution of space in a site-specific approach, applied to a specific building. The performance of the proposed projects, in terms of increase of space when the user is present, was high and therefore achieved the aims and goals of this research. The conclusion was that at all times of the simulation the individual spatial entities were bigger than the guaranteed space. Despite their different approaches of distribution, there was a similar performance in both projects.

7.7 OVERALL CONCLUSIONS

I recognised that there is a potential in the unused space of buildings in an urban context. I first raised awareness of this dormant resource and secondly created access to it. I developed strategies of how the unused space could be used in new forms of real-time distribution between complementary patterns of use, enabled by current technologies. In the case studies' simulations this resulted in an effective space gain for both complementary programmes upon presence of users.

7.8 CRITICAL STATEMENTS

It is important to emphasize that the intended original contribution to knowledge of this research must be primarily read in terms of technical innovation. In the proposed system of distribution of space some social, political and cultural aspects were mentioned but not addressed in depth because they are outside the scope of this research.

For instance, the change of size in real-time and its effects on the users, on the domestic space and on the working environment could be the object of further investigation, evaluating the level of readiness of the target user groups for the proposed system.

The use of software to manage the system has also been presumed to be fully reliable. The thesis acknowledged the possible risk of hacking information systems or illegally collecting sensitive data from users but limited the scope of investigation to the spatial and technical issues and opportunities arising from utilising computers to manage the proposal. Also, the psychological aspects of living in a building fully controlled by machines are understood but not made part of the investigation.

Finally, some aspects related to the practicability of the system suggested that this could be further investigated. This would mean rendering the system technically mature and solving potential problems at a prototypical scale.

Similarly, the potential savings gained in adopting this system (in infrastructure erection, maintenance, energy consumption) could prove to be not as advantageous if the cost of operating and maintaining such a structure outweighed the savings.

7.9 FURTHER RESEARCH AND DEVELOPMENTS

Buildings like this can allow a dynamic negotiation and new forms of sharing of space. These can be developed into economical models where factors like utility bills, rent, etc. can be part of a credit system of give and take. With this, new negotiation systems can emerge in the context of the internet of things and non-human exchanges. Also energetic factors can be optimized according to supply and demand.

Through the double-use of buildings, there are side benefits of different orders: ecological, economic, social, cultural that can be developed into further research. Smart energy management and topics like the Smart Grid topic could be embedded in a further development of the current research.

One further hypothesis is whether systems like this could solve the housing problem present in cities like Munich, where there is a lack of affordable space in the inner-city.

The system of distribution of space I developed is a reaction to presence or absence of a user. The relationship of the enlarging/shrinking space with the body of the user is considered of interest for a further research, however it was not the goal of the present work. Here I only considered more general observations of the personal sphere.

One aspect that could be further investigated is the topic of DIY (do it yourself): I explored it at an initial phase of the research (see essay in appendix). DIY could happen at a 'hardware' level, people catering for their own desires in the design of the actual spatial entities and thresholds (in terms of choice of materials, building their own collapsible furniture, etc). However a more important level of DIY would be at a 'software' level. The system could evolve into an open-source community-based and community-led approach. Here each user could design a plug-in to the basic software of distribution of space, and set up her/his routine and exceptions .

This kind of DIY would allow even more spontaneous personal desires for space to be assured. This would also give an evolutionary status to the design. Feedback from the different individual plug-ins (users) would constantly re-inform the structure, which would learn from this feedback, and could in real-time be reconfigured according to personal wishes and needs. This is also the dream of Spyridaki, whose walls respond to his desires, and can either be like a 'protective armour' or can 'blossom out of their own space'¹.

¹ Georges Spyridaki, *Mort Lucide*, (qtd. in Gaston Bachelard, *The Poetics of Space [La Poétique de L'espace, 1958]*, Trans Maria Jolas (Boston: Beacon Press, 1994), p. 51.

LIST OF ILLUSTRATIONS	Page
Introductory Remarks	
Fig. 1 Tridom, Extension of a residential building, Munich 2009	12
Fig. 2 Entangled Eidicity, Installation, Förderpreis Exhibition, Munich 2013	13
Fig. 3 Entangled House, Complementing building, Munich 2014, Project	14
Introduction	
Context Architecture	
Fig. 4 Maison du Peuple à Clichy, Paris, France, J. Prouvé et E. Beaudouin, M. Lods, V. Bodiansky, 1939: Reproduced from Sulzer, <i>Jean Prouvé, Oeuvre complete, Volume 2: 1934 - 1944</i> (2000)	25
Fig. 5 No-Stop City, Archizoom Associati, 1970 Reproduced from Branzi, <i>No-Stop City: Archizoom Associati</i> (2006)	27
Fig. 6 Nagakin Capsule Tower, Tokyo, Japan, K. Kurokawa, 1971 Reproduced from French, <i>Key Urban Housing of the Twentieth Century: Plans, Sections, and Elevations</i> (2008)	29
Fig. 7 Generator, USA, C. Price with J. & J. Frazer, 1980 Reproduced from Price, <i>Cedric Price: The Square Book</i> (2003)	31
Context Society Culture Technology	
Fig. 8 Percentage of smartphone users for all mobile phone owners in Germany from January 2010 to August 2013 (top) Development of the car sharing industry in Germany 1997-2014 (bottom) Reproduced from Statistik: <i>Absatz Der Smartphones so Hoch Wie Noch Nie - Technik, Trends & Web 2.0'</i> < http://xyonline.de/2012/05/statistik-absatz-der-smartphones-so-hoch-wie-noch-nie/ > [accessed 26 May 2014] (top) Reproduced from Carsharing - <i>Autos Nutzen Statt Besitzen</i> < http://www.vcd.org/carsharing.html > [accessed 26 May 2014]. (bottom)	39
Fig. 9 Personal sphere, different enlargements in different spatial situations	45
Patterns of use and User Identification	
Fig. 10 Yokohama Harbour Urban Design Forum, Rem Koolhaas, 1992: "assemblage of programs" representing 24 hours Reproduced from Koolhaas, Rem, and Office for Metropolitan Architecture, <i>Small, Medium, Large, Extra-Large</i> (1998)	51
Fig. 11 Patterns of use taking place in buildings representing the seven days of a week	53
Fig. 12 Patterns of use taking place in buildings representing the seven days of a week	54
Fig. 13 Patterns of use taking place in buildings representing the seven days of a week	55
Fig. 14 Survey: Questionnaire	57
Fig. 15 Survey: Participant's recorded presence at their house over one week	59
Elastic Architecture	
Fig. 16 Elastic Architecture Series: Zufall: Sections and model	66
Fig. 17 P. Virilio & C. Parent, <i>Le Potentialisme</i> , 1966. Sketch. Topotonique, concept 1966. Drawing. Reproduced from Paul Virilio, Claude Parent and Bernd Wilczek, <i>Architecture principe: 1966 and 1996</i> (2000).	68

Fig. 18	Elastic Architecture Series: Interwoven paths II	70
Fig. 19	Elastic Architecture Series: Interwoven paths II, process	71
Fig. 20	Elastic Architecture Series: Orthogonal interpenetration II	72
Fig. 21	Elastic Architecture Series: Orthogonal interpenetration II, process	73
Fig. 22	Elastic Architecture Series: Interactive elastic model	74
Fig. 23	Elastic Architecture Series: Interactive elastic model: Mutation by actuation (nylon strings)	75
Fig. 24	Elastic Architecture Series: Interactive elastic model, process	76
Fig. 25	Top: Taichung Metropolitan Opera, Taiwan, Toyo Ito, 2014 Bottom: Radiator (geomerty aiming for maximised temperature exchange)	78
Fig. 26	Chateau Chambord, Chambord, France 1519-1547 Top left: Ground floor plan Top right: Ground floor plan in detail Bottom left: Intersection of the stair Bottom right: Staircase 1st floor, at the level of the armory Reproduced from Pierre Gascar, <i>Chambord</i> (1965)	79
Fig. 27	Elastic Architecture Series: Construction principle for the Grasshopper script (1)	80
Fig. 28	Elastic Architecture Series: Construction principle for the Grasshopper script (2)	82
Fig. 29	Elastic Architecture Series: Digital parametric model: Animation of reactive behaviour: Cuboids' growth and shrinkage	83
Fig. 30	Elastic Architecture Series: Digital parametric model: Simulation #1	84
Fig. 31	Elastic Architecture Series: Digital parametric model: Simulation #1	85
Fig. 32	Elastic Architecture Series: Digital parametric model: Simulation #2 (running dog)	86
Fig. 33	Elastic Architecture Series: Digital parametric model: Simulation #2 (running dog)	87
Fig. 34	Elastic Architecture Series: Digital parametric model: Simulation #3, wireframe	89
Fig. 35	Elastic Architecture Series: Digital parametric model: Simulation #3	90
Fig. 36	Elastic Architecture Series: Digital parametric model: Simulation #3	91
Fig. 37	Elastic Architecture Series: Digital parametric model: Tectonic approximation #1	92
Fig. 38	Elastic Architecture Series: Digital parametric model: Tectonic approximation #2	93
Fig. 39	Elastic Architecture Series: Digital parametric model: Tectonic approximation #3	94
Fig. 40	Elastic Architecture Series: Digital parametric model: Tectonic approximation #3, perspective and section	95
Fig. 41	Elastic Architecture Series: Digital parametric model: Tectonic approximation #4	96
Fig. 42	Elastic Architecture Series: Digital parametric model: Tectonic approximation #4	97
Fig. 43	Elastic Architecture Series: Digital parametric model: Tectonic approximation #4	98
Fig. 44	Elastic Architecture Project: Grasshopper script	100
Fig. 45	Elastic Architecture Series: Digital parametric model, configurations #1, #2 and #3	102

Case Studies: Tracks and Curtain Projects

Fig. 46	Top left: Baureferat, Munich, 1999: Current status: Section3D, current status Top right: Baureferat, Munich, 1999: Current status: Structural analysis Bottom: Baureferat, Munich, 1999: Current status: Urban-site plan	109
Fig. 47	Baureferat, Munich, 1999: Structure	110
Fig. 48	Baureferat, Munich, 1999: Current status: Organisation analysis	111
Fig. 49	Baureferat, Munich, 1999: Current status: Exterior, current status	112
Fig. 50	Baureferat, Munich, 1999: Plan of Haus 2	118
Fig. 51	Distribution Equation	120
Fig. 52	Distribution Parameters	121
Fig. 53	Case Study Tracks: Top: Basis configuration Bottom: Spatial entities configurations according to the system of distribution of space	122
Fig. 54	Case Study Tracks: Top: Dwelling unit guaranteed size Bottom: Dwelling unit in absent mode	126
Fig. 55	Case Study Tracks: Top: Office unit guaranteed size Bottom: Office unit in absent mode	127
Fig. 56	Case Study Tracks: Exemplary application for GPS-sensed smart mobile devices. Bottom up approach for the distribution of space.	128
Fig. 57	Case Study Tracks: Grasshopper script and founding mathematical expression	130
Fig. 58	Case Studies, Dwellers' Spreadsheet	131
Fig. 59	Case Study Tracks: South east elevation at Trausnitzstraße: The elevation displays at each storey a different time of the simulated day: 5th floor = distribution at 6:00 h, 4th at 8:00 h, 3rd at 11:00h, 2nd at 14:00 h, 1st. at 18:00 h	132
Fig. 60	Case Studies, Offices Spreadsheet	134
Fig. 61	Case Study Tracks: Record of the dynamic performance over 24 hours (48 times 30 minutes) and their spatial representation and performance of space dividing thresholds (right)	135
Fig. 62	Case Studies Tracks, Fastest moving separation wall	136
Fig. 63	Case Study Tracks: Top: Dwelling unit Bottom: Office unit	137

Fig. 64	Case Study Tracks: Technical components	139
Fig. 65	Baureferat, Munich, 1999: Plan of Haus 2	141
Fig. 66	Case Study Curtain: Top: Basis configuration Bottom: Spatial configurations to varying presence of users	144
Fig. 67	Curtains Positions L.2 and S.2 (guaranteed space)	146
Fig. 68	Curtains Positions L.3 and S.2 (increased area on one side)	146
Fig. 69	Curtains Positions L.3 and S.3 (increased area on both sides)	147
Fig. 70	Curtains Positions L.1 and S.1	147
Fig. 71	Dynamic Desk Device (DDD)	148
Fig. 72	DDD configuration in guaranteed space	148
Fig. 73	DDD configuration along windows	148
Fig. 74	Curtains Project: Continuous Office Zone	149
Fig. 75	Curtains Project: DDDs form a tight group	149
Fig. 76	Case Study Curtain: Dwelling unit and its spatial performance a) unused; b) guaranteed space; c) profiting from absent neighbours	150
Fig. 77	Case Study Curtain: Office unit and its spatial performance a) unused; b) guaranteed space; c) profiting from absent neighbours	151
Fig. 78	Case Study Curtain: Plans of the two units Top: Dwelling unit Bottom: Office unit	152
Fig. 79	Case Study Curtain: Dynamic desk device	153
Fig. 80	Different curtains position P1, P2, P3	154
Fig. 81	Curtains position matrix	154
Fig. 82	Case Study Curtain: Top: Operational matrix Bottom: Positioning of the dynamic elements according to all possible combinations of two neighbouring spatial units	156
Fig. 83	Case Study Curtain: Positioning of the dynamic elements according to all possible combinations of two neighbouring spatial units (1 = used; 0 = unused)	157
Fig. 84	Case Study Curtain: Varying spatial configurations according to the positioning of the curtains; a) unused; b) guaranteed size; c) gaining space from left neighbour; d) gaining space from left and right neighbour	159
Fig. 85	Case Study Curtain: Record of the dynamic performance over 24 hours (48 times 30 minutes) and their spatial representation and performance of space dividing thresholds (right)	162
Fig. 86	Case Study Curtain: One storey captured at different times of the day: Top to bottom: 6:00 h, 8:00 h, 11:00 h, 14:00 h, 18:00 h	163
Fig. 87	Case Study: Curtain: Performance analysis and Grasshopper skript	164
Fig. 88	Case Study Curtain: Technical components of one curtain system	166
Fig. 89	Case Studies Curtain (left) and Tracks (right): Comparison of the dynamic performance over 24 hours (48 times 30 minutes)	168
Fig. 90	Case Studies Curtain (left) and Tracks (right): Comparison of the performance of space dividing thresholds	169

Glossary

Activity

Action by the user of a room/building taking place inside a building.

Adaptive architecture

the adaption of the architecture to its user's demands, in a feedback loop system.

Basis Configuration

is the start configuration of both case studies Tracks and Curtain for the case that all spatial entities are in use at the same time. This configuration also defines the guaranteed size of each spatial entity.

Building envelope

the physical separators between the conditioned and unconditioned environment of a building.

Collapsible

Ability of one or more objects to be folded or pushed together or into a smaller space.

Conditioned space

The part of the building that contains air with different properties (e.g. heated, cooled, humidified, filtered, etc.) than the air of the environment outside of the building; e.g. for the comfort of the building users or to keep goods at defined temperature.

Digital Natives

Also known as Generation Y. Persons which were born or brought up during the age of digital technology, who are close to computers, the internet and other new technologies.

DIY

Abbreviation of Do It Yourself. A self-performed act of home- improvement or similar craftsman activities performed by amateurs

Duality:

Opposition between two concepts or two aspects of one thing.

Elasticity

describes in physical terms the ability of materials to be deformed and to return afterwards to their original shape.

Existenzminimum

an entitlement to a basic minimum standard of living

Flexible

Architectures with

Flexibility

In his book *Words and Buildings* Adrian Forty identifies three distinct strategies of flexibility in architecture: flexibility by redundancy, flexibility by technical means and flexibility as a political strategy.

Flexitime

Work scheme where employees are expected to be present at the work place in defined core times of the day. The remaining work hours can be set by the employee.

Flex space

System for office spaces where employees do not have a personally assigned desk space. Employee chose any free desk, connect to the computer network and work there for the day.

Generation Y:

>> Digital Natives

Hybrid Building (p. 7 - Abstract)

A building that combines more than one programme; a typical example is a shopping mall and a cinema and a hotel and dwellings all in the same building.

Internet of Things

New generation of internet- connected devices. The connection is established by cheap embedded micro sensors which are able to send and receive data.

Pattern of use

Time recording of the use of spaces

Persona

Fictional character used for scenarios

Pool

The sum of all distributable space

Programme (of a Building)

The purpose, for which a building is used, e.g. as a residential building, as commercial building, as office, administration, etc. (Cp. Rem Koolhaas¹)

Sensing and Actuation

Continuous cycle of collecting data and reacting according to the data. This leads to a change in the system and the cycle begins again.

Sharing Economy

¹ Rem Koolhaas and Office for Metropolitan Architecture., *Small, Medium, Large, Extra-Large: Office for Metropolitan Architecture, Rem Koolhaas, and Bruce Mau*, 2d ed. (New York N.Y.: Monacelli Press, 1998), p. 1221.

An economic model based on sharing underutilized assets from spaces to skills to 'stuff' for monetary or non-monetary benefits.

Smart Grid:

an electricity network based on digital technology that is used to supply electricity to consumers via two-way digital communication. Many government institutions around the world have been encouraging the use of smart grids for their potential to control and deal with global warming, emergency resilience and energy independence scenarios.

Threshold

Thresholds are separations of space that take place in several ways and through different media. Mostly these are walls and physical space-dividers, but nowadays many thresholds are created and mediated through technology. There are also cultural thresholds like, for instance, language barriers which can create spaces between people in a room. They often have a physiological or psychological effect on persons.

Type of Building:

Defines the purpose of a building, e.g. it is a commercial, a residential, an educational, etc...building.

Unused space

interior space that is temporarily not used by any person but that is being held available for potential use. Unused space still works as container for goods and furniture.

Used space

interior space that is currently used by at least one present user

User of a Room or Building

Person or group of persons allocated for use of a certain room/building.

Ubiquitous Computing:

'Ubiquitous computing names the third wave in computing, just now beginning. First were mainframes, each shared by lots of people. Now we are in the personal computing era, person and machine staring uneasily at each other across the desktop. Next comes ubiquitous computing, or the age of calm technology, when technology recedes into the background of our lives' (Mark Weiser)

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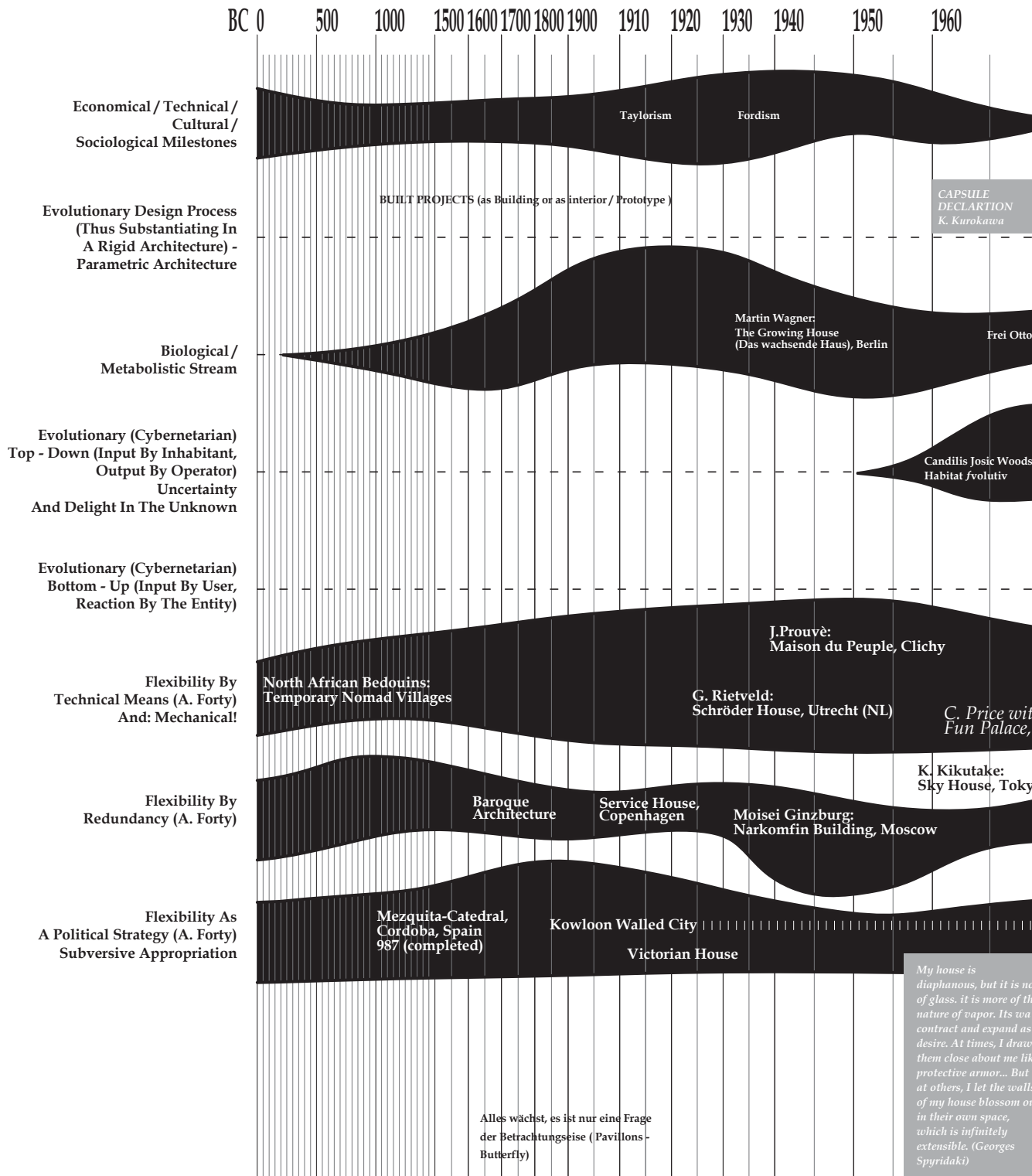
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APPENDIX TABLE OF CONTENT

- APPENDIX A.1 - CATALOGUE OF REFERENCES (RE. CH. 2)
- APPENDIX A.2 - INTERVIEWS (RE. CH. 4)
- APPENDIX A.3 - SURVEY (RE. CH. 4)
- APPENDIX A.4 - ELASTIC ARCHITECTURE SERIES (RE. CH. 5)
- APPENDIX A.5 - SPREADSHEET CALCULATIONS (RE. CH. 6)
- APPENDIX A.6.1 - MANAGEMENT STRUCTURES AND FORMS OF
OWNERSHIP FOR THE PROPOSED CASE
STUDIES (RE. CH. 6)
- APPENDIX A.6.2 - AN ALTERNATIVE MODEL OF USAGE:
THE COMBINATION OF A HOTEL WITH DAY
OFFICES (RE. CH. 6)
- APPENDIX A.7 - ESSAYS
- APPENDIX A.8 - CASE STUDIES (RE CH. 6)

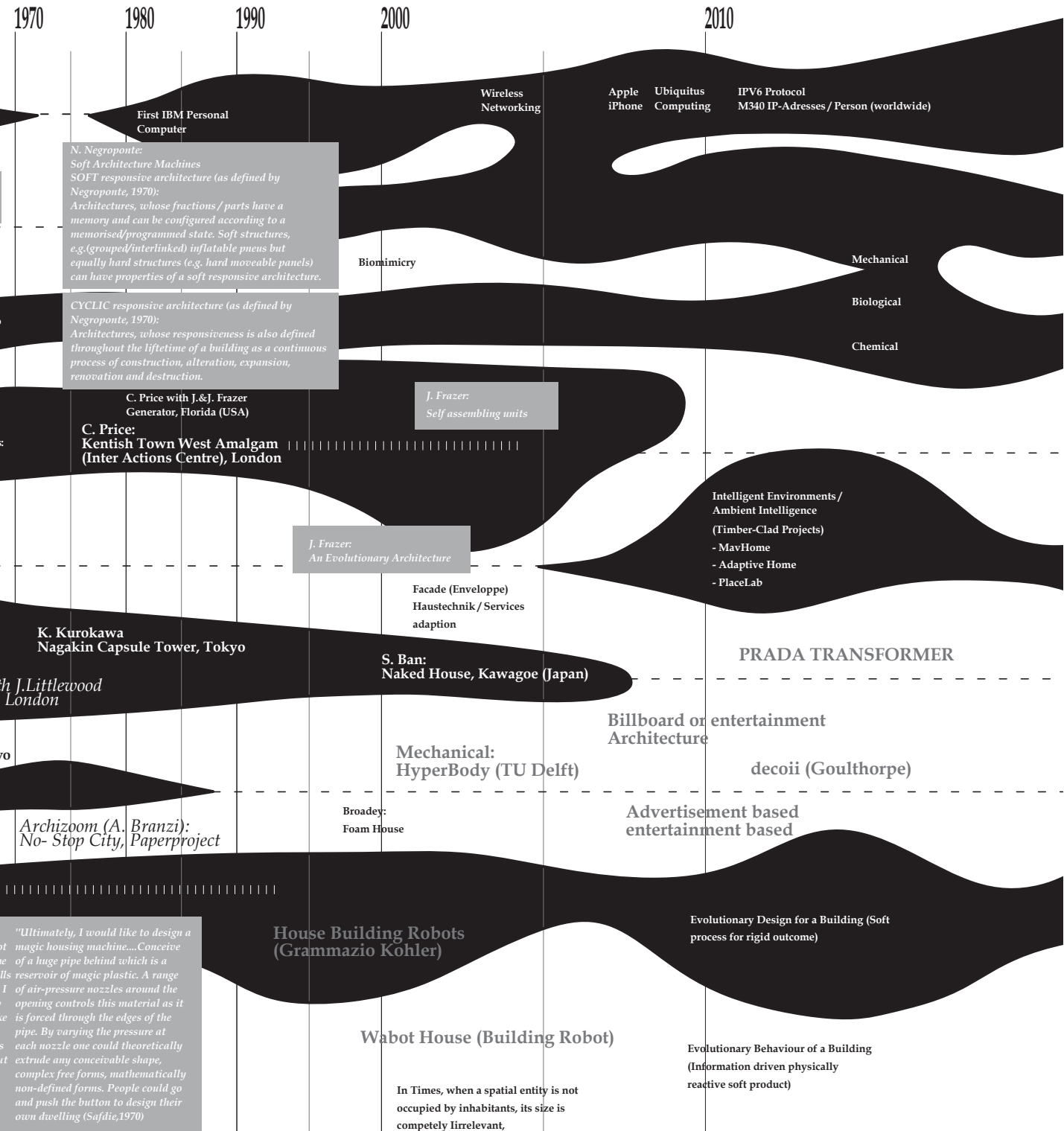
APPENDIX A.1 - CATALOGUE OF REFERENCES (RE. CH. 2)



| Buildings | Large Scale Models/ Advertisement Structures

| Paperprojects | Texts

Architectural reference Projects



Category Flow | | | | | Line of Continuity

Placeholder

Flexibility by Redundancy #1

No-Stop City

Discorsi per immagini (Discourse through images)

Archizoom Associati (Andrea Branzi)

1970

Subtitled RESIDENTIAL PARKINGS - CLIMATIC UNIVERSAL SYSTEM the project proposes a structure of seemingly infinite layers that serve all purposes, supermarkets, housing, business, working, production. The main intention of the project is not the achievement of flexibility. Flexibility is rather a side- effect of the vast production of space. No-Stop City, projected as a Discorso d' immagini rather than as literal architecture comes up with a political message rather than literal floor layouts, sections and models.

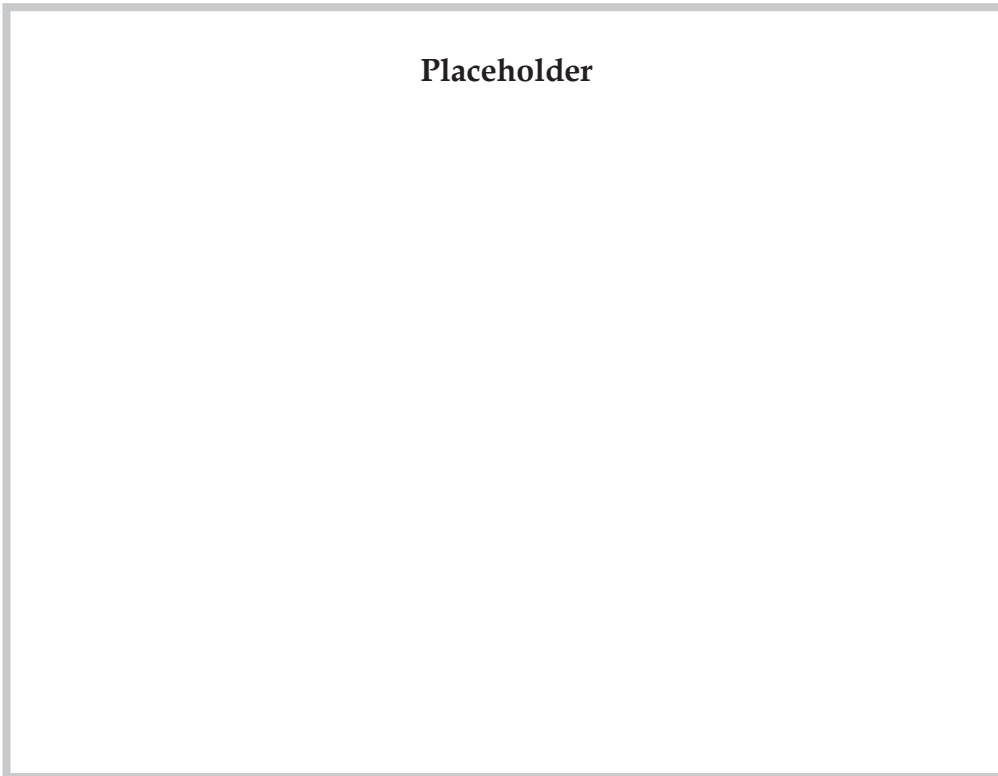
FLEXIBILITY CATEGORIES (as defined by..)	
Forty	Flexibility by Redundancy •
	Flexibility by Technical Means •
	Flexibility as a Political Strategy •
MOTIVE	
economical	
sociological	•
spatial quality	
spatially economical	
entertainment	
cultural	•
commercial advertorial	
legal	
SPATIAL PROFITEUR	
people	•
storage	•
CONTEXT	
urban	
rural	•
COMBINATIONS OF USE	
amount	plenty
programmes and their spatial use of floor area	residential n.a.
in percentage of the whole building	work n.a.
	entertainm. n.a.
	supermkt. n.a.
	manv more n.a.
sum	n.a.
sum can exceed 100% if occupations take place at different times	
PATTERNS OF USE (TIME-RELATED)	
strict (sharp steps)	•
soft (curvy hills)	•
CONTROL - PARTICIPATION	
top-down	•
bottom-up	•
evolutionary (learning)	•
PROJECT STATUS	
built	
paperproject	•
SPATIAL DISTRIBUTION	
internal <--> internal	•
internal <--> external	
space invasive (e.g. Shigeru Ban)	
CHANGING ENTITY	
support / structure (Habracken)	
infill / furniture (Habracken)	•
infrastructure / media	•
armour / bodyextension (Kurokawa)	•
CHANGE	
change of roomsize	
movement of compartments	
implant	•
number of user(groups) affected	plenty
EXPANSION / SHRINKAGE DIRECTION	
horizontal	•
vertical	•
other (e.g.rotating)	
TECHNICAL CHANGE THROUGH	
kinetical / mechanical	•
chemical / biological	
thermal	•
informational	•
RESPONSE SPEED	
sec / min / h / d / weeks / month / years	immediate
FURTHER CATEGORIES	
overall size [m]	500
relevance of daylight	none
relevance of freshair	none
lighting depth (estimation)	undefined

Plans

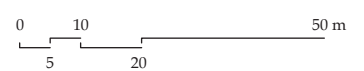
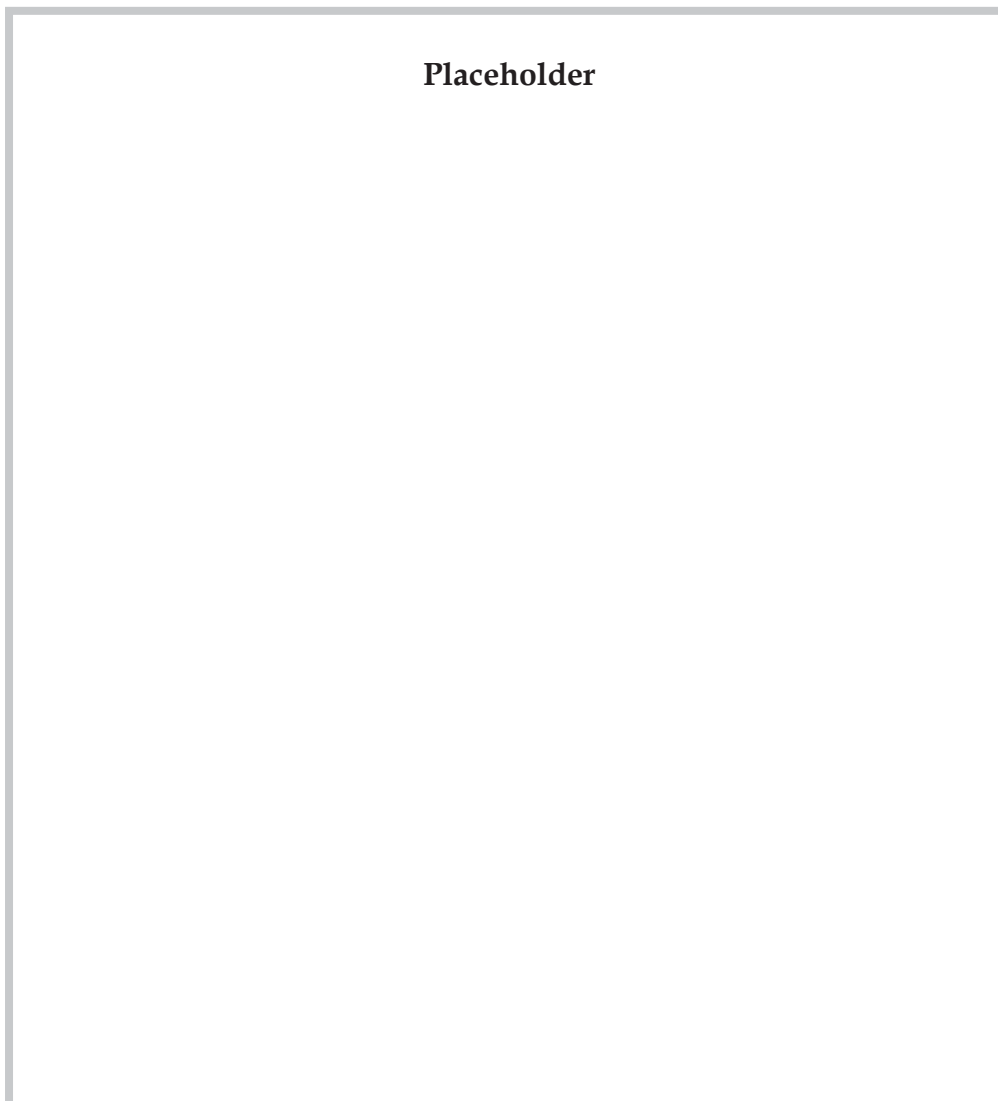
Placeholder

- Residential
- Leisure
- Commercial
- Social
- Religion
- Traffic
- Moving elements

Section, exemplary



Plans, exemplary



Placeholder

Flexibility by Technical Means #1

Maison du Peuple à Clichy
Paris, France

J. Prouvé & E. Beaudouin, M. Lods, V. Bodiansky
1939

FLEXIBILITY CATEGORIES (as defined by..)	
Forty	Flexibility by Redundancy
	Flexibility by Technical Means
	Flexibility as a Political Strategy
MOTIVE	
	economical
	sociological
	spatial quality
	spatially economical
	entertainment
	cultural
	commercial advertorial
	legal
SPATIAL PROFITEUR	
	people
	storage
CONTEXT	
	urban
	rural
COMBINATIONS OF USE	
amount	3
programmes and their spatial use of floor area	market 80%
in percentage of the whole building	cinema 25%
	theatre 25%
	convention 25%
	/ 0%
sum	155%
sum can exceed 100% if occupations take place at different times	
PATTERNS OF USE (TIME-RELATED)	
	strict (sharp steps)
	soft (curvy hills)
CONTROL - PARTICIPATION	
	top-down
	bottom-up
	evolutionary (learning)
PROJECT STATUS	
	built
	paperproject
SPATIAL DISTRIBUTION	
	internal <-> internal
	internal <-> external
	space invasive (e.g. Shigeru Ban)
CHANGING ENTITY	
	support / structure (Habraken)
	infill / furniture (Habraken)
	infrastructure / media
	armour / bodyextension (Kurokawa)
CHANGE	
	change of roomsize
	movement of compartments
	implant
	number of user(groups) affected
	4
EXPANSION / SHRINKAGE DIRECTION	
	horizontal
	vertical
	other (e.g. rotating)
TECHNICAL CHANGE THROUGH	
	kinetical / mechanical
	chemical / biological
	thermal
	informational
RESPONSE SPEED	
sec / min / h / d / weeks / month / years	1 h
FURTHER CATEGORIES	
overall size [m]	40 x 48 x 22
relevance of daylight	high
relevance of freshair	high
lighting depth (estimation)	~20m (roof)

“The schedule required the building of a Maison du Peuple, the great hall of which could accommodate 1,500 to 2,000 people – so that it would be possible to show films (500 seats) in part of the great hall – and to make available a number of offices for the use of local societies, trades unions, etc. The solution adopted was made possible by the fact that the two main components, the Market and the Maison du Peuple, never operated at the same time. The whole area of the ground floor was left free. On the first floor, the central part consisted of an operable floor, the eight components of which could be moved towards the stage and stored on it. The cinema and the promenades and foyer bar could be separated by a sliding partition of articulated panels that folded away behind the stage. Finally, the glazed roof which lit the hall was fully openable”

Techniques et Architecture (1955) (qtd. In Peter Sulzer, Jean Prouvé and Erika Sulzer-Kleinemeier, Jean Prouvé, Oeuvre complete, Volume 2: 1934 - 1944.

(Basel [u.a.]; Berlin: Birkhäuser [u.a.], 2000), p. 187.)

View from the Convention's room

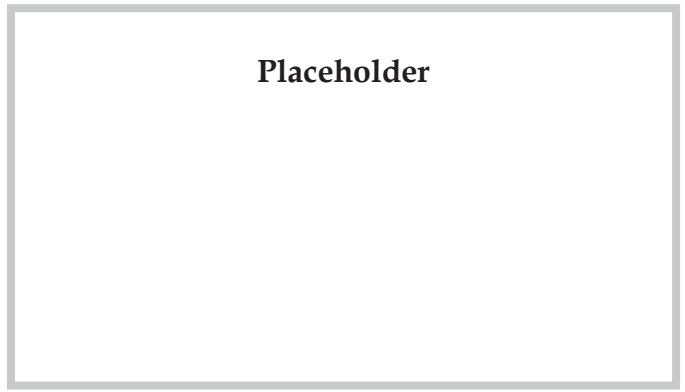
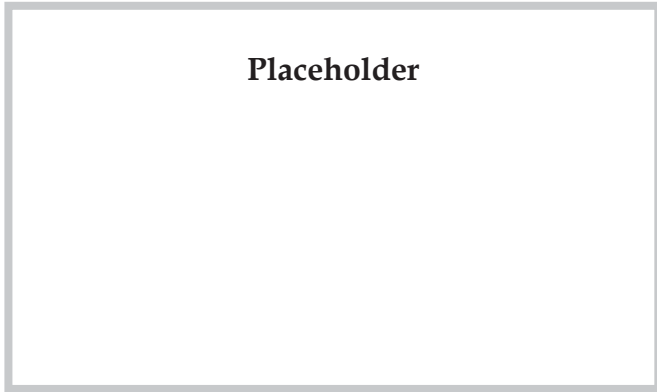
Placeholder

- Residential
- Leisure
- Commercial
- Social
- Religion
- Traffic
- Moving elements

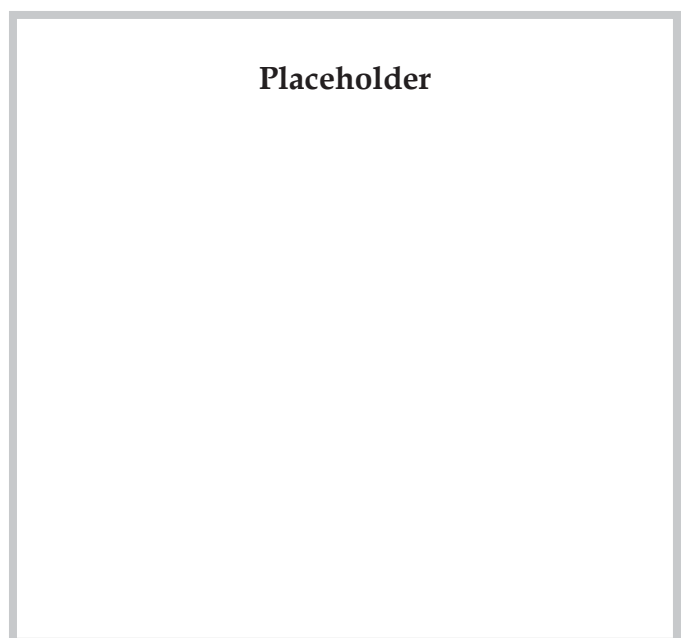
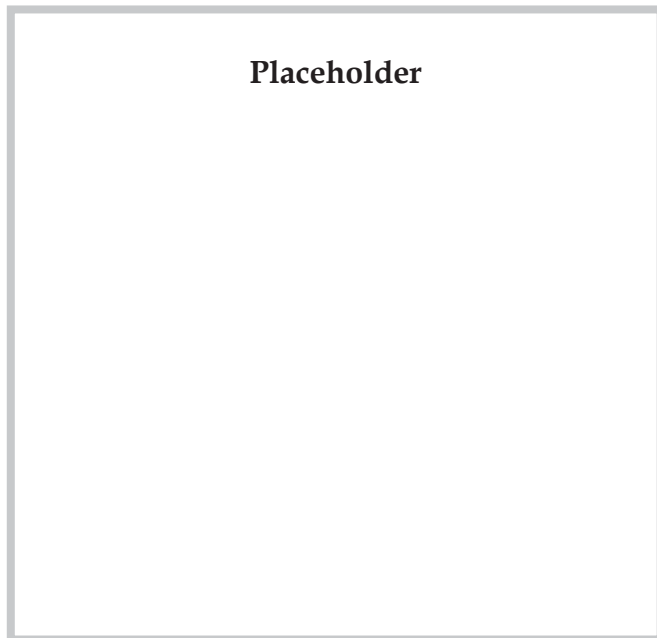
DAY TIME USE
Market

EVENING USE
Cinema, Theatre, Convention

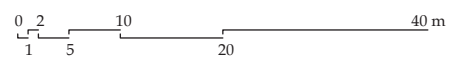
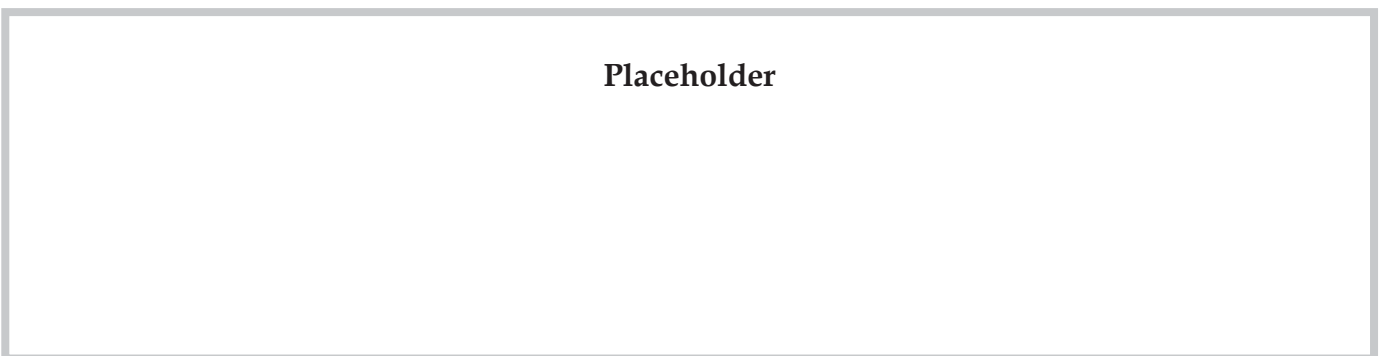
Section



First floor plan



Isometric views



Placeholder

Flexibility by Technical Means #2

Nagakin Capsule Tower
Tokyo, Japan
K. Kurokawa
1971

FLEXIBILITY CATEGORIES (as defined by..)	
Forty	Flexibility by Redundancy
	Flexibility by Technical Means
	Flexibility as a Political Strategy
MOTIVE	
	economical
	sociological
	spatial quality
	spatially economical
	entertainment
	cultural
	commercial advertorial
	legal
SPATIAL PROFITEUR	
	people
	storage
CONTEXT	
	urban
	rural
COMBINATIONS OF USE	
amount	2
programmes and their spatial use of floor area	residential 50%
in percentage of the whole building	business 50%
	/ 0%
	/ 0%
	/ 0%
sum	100%
sum can exceed 100% if occupations take place at different times	
PATTERNS OF USE (TIME-RELATED)	
	strict (sharp steps)
	soft (curvy hills)
CONTROL - PARTICIPATION	
	top-down
	bottom-up
	evolutionary (learning)
PROJECT STATUS	
	built
	paperproject
SPATIAL DISTRIBUTION	
	internal <-> internal
	internal <-> external
	space invasive (e.g. Shigetsu Ban)
CHANGING ENTITY	
	support / structure (Habraken)
	infill / furniture (Habraken)
	infrastructure / media
	armour / bodyextension (Kurokawa)
CHANGE	
	change of roomsize
	movement of compartments
	implant
number of user(groups) affected	2
EXPANSION / SHRINKAGE DIRECTION	
	horizontal
	vertical
other (e.g.rotating)	replace unit
TECHNICAL CHANGE THROUGH	
	kinetical / mechanical
	chemical / biological
	thermal
	informational
RESPONSE SPEED	
sec / min / h / d / weeks / month / years	1 day
FURTHER CATEGORIES	
overall size [m]	24 x 14 x 40
relevance of daylight	high
relevance of freshair	high
lighting depth (estimation)	~5m

The Nagakin Capsule tower is probably the most important work of the Japanese Metabolist group – a clear demonstration of their ideas that architecture should not be thought of as fixed or static, but should have the potential to grow or change over time. This notion is expressed here by Kurokawa through his use of capsules manufactured using non-traditional construction methods. The building can be thought of in two parts. One element is the fixed structural towers that contain the lifts, stairs and services and are constructed of steel and concrete. The second element, the habitable parts, is the individual pods: manufactured from lightweight steel in a factory and brought to site to be attached to the superstructure, they are more like pieces of equipment than dwellings. Intended for single people, many apartments were bought for use as pieds-à-terre by businessmen. At street level there is an entrance lobby and multi-purpose hall, and access to the two towers via stairs and lifts. The first floor houses some commercial office space to cater for the large number of business occupants. As the capsules spiral around the towers, the entrances to the apartments are situated at each landing; the two towers are only connected to each other at the sixth floor level, via a bridge. Inside, the capsules are fully fitted out with furniture and equipment. A bathroom unit is located in one corner of the space next to the entrance, and the bed space fits across the opposite end. The rest of the wall space is fitted with different kinds of storage units and optional fittings such as a freezer or audio-visual equipment, calculators and a desk. All the capsules are the same size, 2.5 x 4 metres in plan and 2.5 metres high, with some variation in layout depending on the location of the entrance. They are equipped with air conditioning as standard and daylighting comes from the large, 1.3-metre diameter windows in the end elevation."

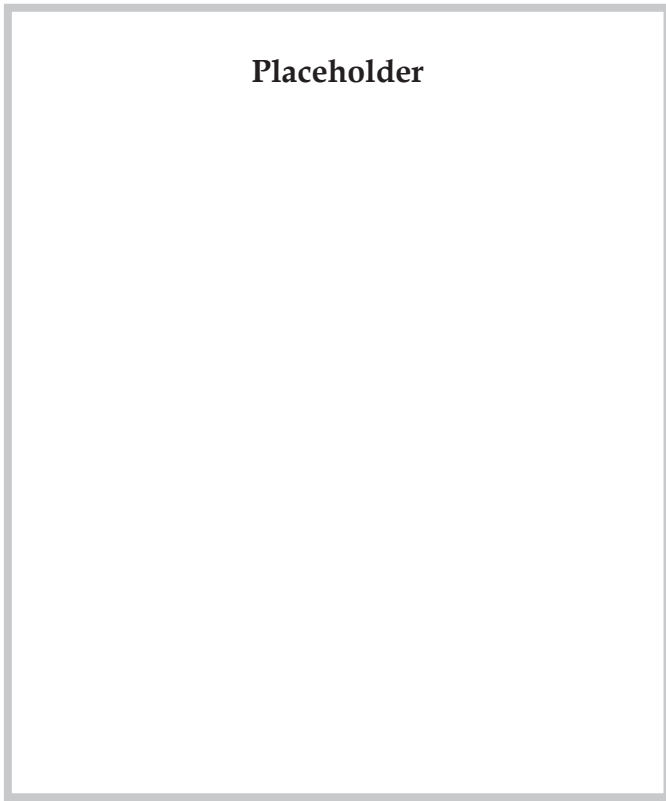
Hilary French, Key Urban Housing of the Twentieth Century : Plans, Sections, and Elevations (New York: W.W. Norton, 2008), p. 142.

Cell

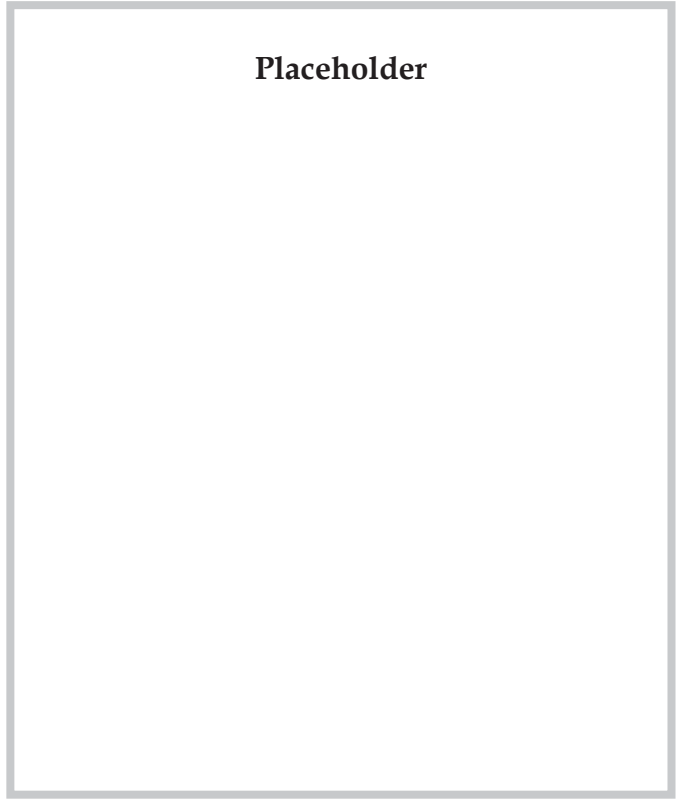
Placeholder

- Residential
- Leisure
- Commercial
- Social
- Religion
- Traffic
- Moving elements

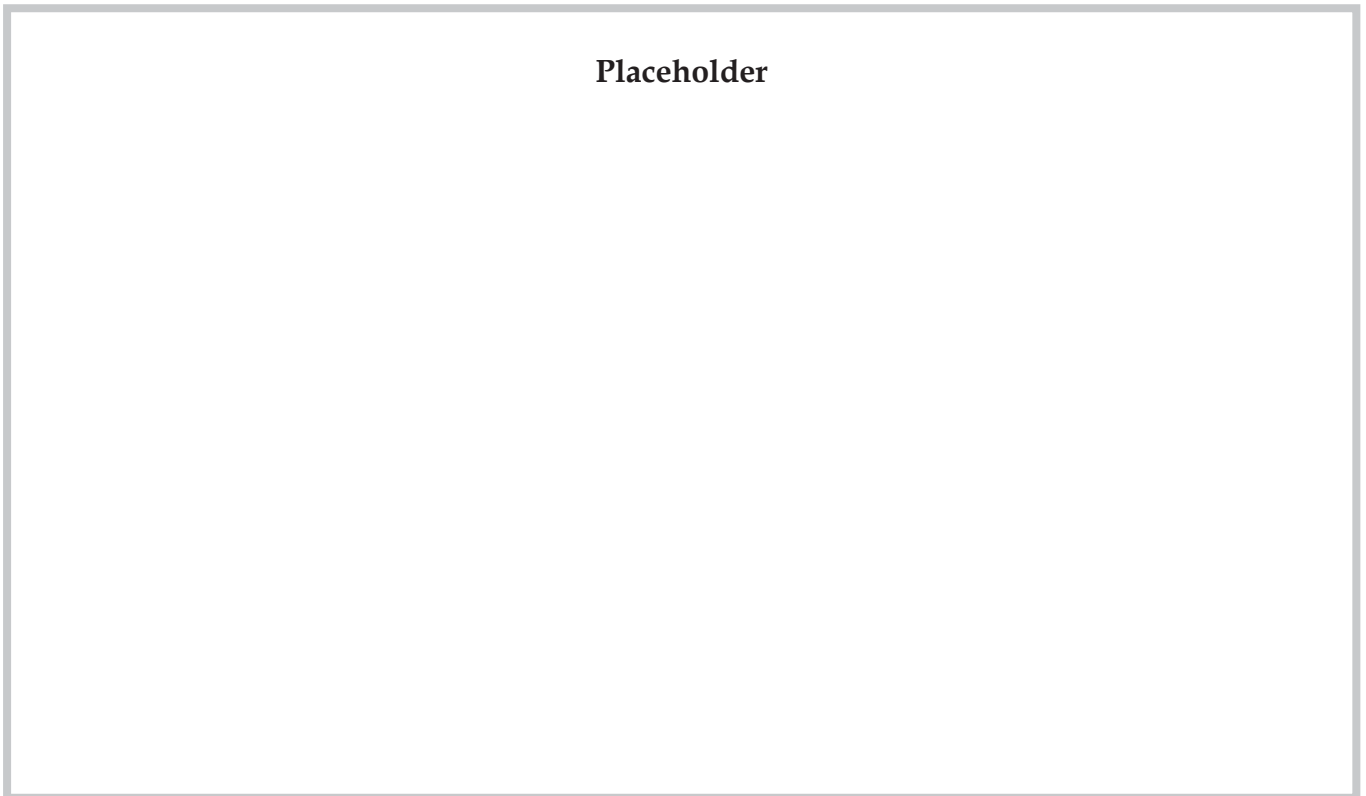
Elevation



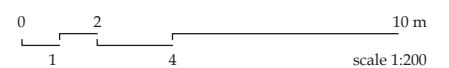
View from the city



Plan



each unit could be individually replaced
allowing for a bottom up approach to
the provided infrastructure



Placeholder

Flexibility by Technical Means #3

Generator

USA

C. Price with J. & J. Frazer

1980

FLEXIBILITY CATEGORIES (as defined by..)	
Forty	Flexibility by Redundancy
	Flexibility by Technical Means
	Flexibility as a Political Strategy
MOTIVE	
	economical
	sociological
	spatial quality
	spatially economical
	entertainment
	cultural
	commercial advertorial
	legal
SPATIAL PROFITEUR	
	people
	storage
CONTEXT	
	urban
	rural
COMBINATIONS OF USE	
amount	1
programmes and their spatial use of floor area	offices 100%
in percentage of the whole building	/ 0%
	/ 0%
	/ 0%
	/ 0%
sum	100%
sum can exceed 100% if occupations take place at different times	
PATTERNS OF USE (TIME-RELATED)	
	strict (sharp steps)
	soft (curvy hills)
CONTROL - PARTICIPATION	
	top-down
	bottom-up
	evolutionary (learning)
PROJECT STATUS	
	built
	paperproject
SPATIAL DISTRIBUTION	
	internal <-> internal
	internal <-> external
	space invasive (e.g. Shigeru Ban)
CHANGING ENTITY	
	support / structure (Habraken)
	infill / furniture (Habraken)
	infrastructure / media
	armour / bodyextension (Kurokawa)
CHANGE	
	change of roomsize
	movement of compartments
	implant
	number of user(groups) affected
	1
EXPANSION / SHRINKAGE DIRECTION	
	horizontal
	vertical
	other (e.g.rotating)
TECHNICAL CHANGE THROUGH	
	kinetical / mechanical
	chemical / biological
	thermal
	informational
RESPONSE SPEED	
	sec / min / h / d / weeks / month / years
	10 min
FURTHER CATEGORIES	
	overall size [m]
	n.a.
	relevance of daylight
	high
	relevance of freshair
	high
	lighting depth (estimation)
	n.a.

Especially interesting when looking at the aspect of control. This project, widely celebrated as the first intelligent building, reacts to the demands of the users with a cybernetarian feedback approach and represents an example of evolutionary architecture

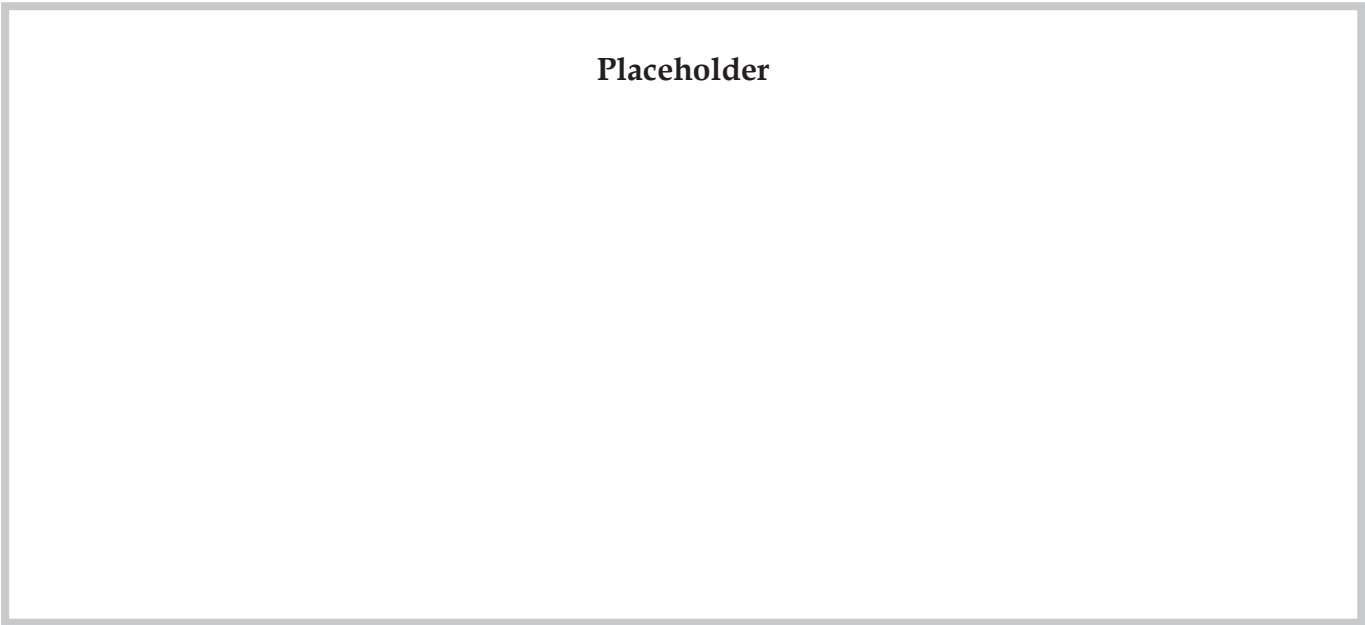
'Instantaneous architectural response to a particular problem is too slow. Architecture must concern itself continually with the socially beneficial distortion of the environment. Like medicine must move from the curative to the preventive. Architecture should have little to do with problem solving - rather it should create desirable conditions and opportunities hitherto thought impossible.

With this intention the client asked me to investigate whether architecture could help in providing such conditions for the individual and group from both inside and outside the company. The subsequent feasibility study proving positive, the Generator was born - an architectural complex with no previous title and no predefined use, only a desired end-effect. Sited in Florida, the Generator's services and structures respond to the users' wishes with help from both crumage and computer.'

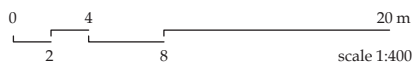
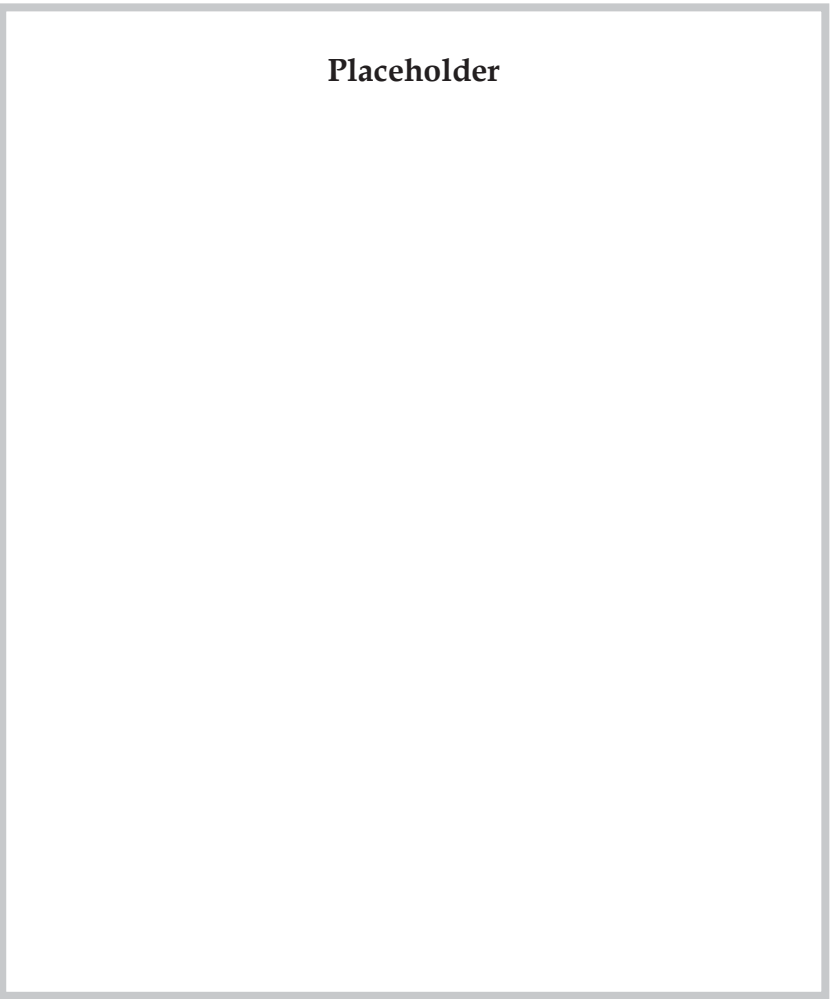
Cedric Price, Cedric Price. ([London]: [Architectural Association], 1984), p. 92.

Placeholder

- Residential
- Leisure
- Commercial
- Social
- Religion
- Traffic
- Moving elements



Menu 25: details of SW zone - ground level



Various wet serviced cubes



Placeholder

FLEXIBILITY CATEGORIES (as defined by..)	
Forty	Flexibility by Redundancy
	Flexibility by Technical Means
	Flexibility as a Political Strategy
MOTIVE	
	economical
	sociological
	spatial quality
	spatially economical
	entertainment
	cultural
	commercial advertorial
	legal
SPATIAL PROFITEUR	
	people
	storage
CONTEXT	
	urban
	rural
COMBINATIONS OF USE	
amount	1
programmes and their spatial use of floor area	residential 100%
in percentage of the whole building	/ 0%
	/ 0%
	/ 0%
	/ 0%
sum	100%
sum can exceed 100% if occupations take place at different times	
PATTERNS OF USE (TIME-RELATED)	
	strict (sharp steps)
	soft (curv hills)
CONTROL - PARTICIPATION	
	top-down
	bottom-up
	evolutionary (learning)
PROJECT STATUS	
	built
	paperproject
SPATIAL DISTRIBUTION	
	internal <--> internal
	internal <--> external
	space invasive (e.g. Shigeru Ban)
CHANGING ENTITY	
	support / structure (Habraken)
	infill / furniture (Habraken)
	infrastructure / media
	armour / bodyextension (Kurokawa)
CHANGE	
	change of roomsize
	movement of compartments
	implant
	number of user(groups) affected
	4
EXPANSION / SHRINKAGE DIRECTION	
	horizontal
	vertical
	other (e.g.rotating)
TECHNICAL CHANGE THROUGH	
	kinetical / mechanical
	chemical / biological
	thermal
	informational
RESPONSE SPEED	
sec / min / h / d / weeks / month / years	5 min
FURTHER CATEGORIES	
overall size [m]	20 x 7 x 5
relevance of daylight	high
relevance of freshair	high
lighting depth (estimation)	10 m

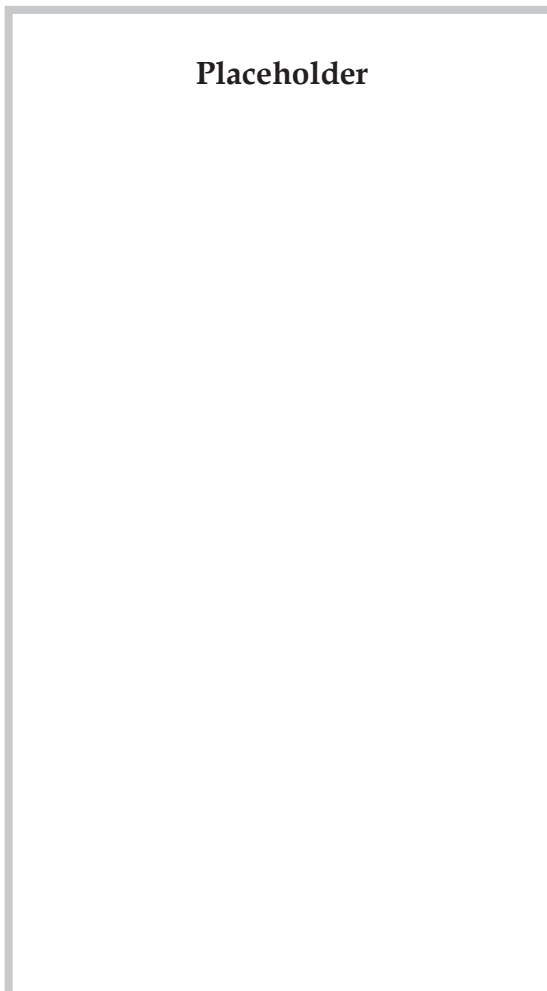
Flexibility by Technical Means #4

Naked House
Kawagoe, Japan
Shigeru Ban
2000

Three generations share a single common space in which private areas consist of four mobile bedrooms. 'The open-plan and neutral space of the shed can be organised and transformed as needed by moving the bedrooms, they even can be drawn out to the garden through the large window on the western facade.'¹ This is an example of flexibility by technical means. However for this flexibility to take place some measures are necessary, like the existence of a common fixed wardrobe for the whole family, and the fixity of the wet areas. The movement is limited to the areas without infrastructure.

¹STORIES OF HOUSES: The Naked House in Kawagoe, by Shigeru Ban' <<http://storiesofhouses.blogspot.de/2005/10/naked-house-in-kawagoe-by-shigeru-ban.html>> [accessed 24 February 2014].

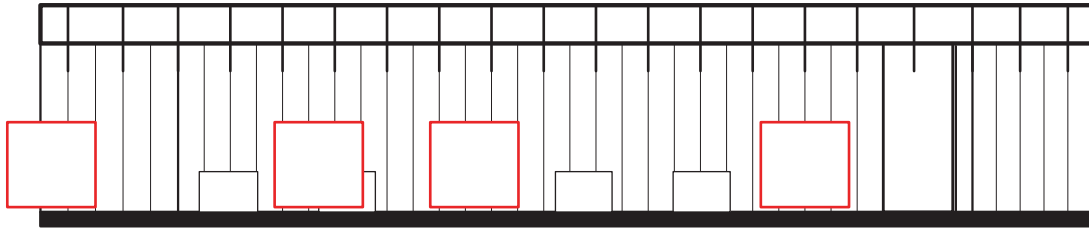
Isometric View



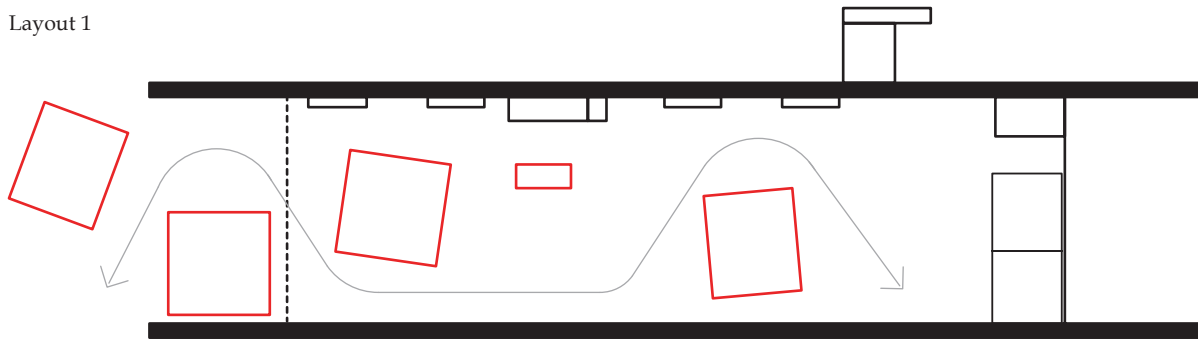
- Residential
- Leisure
- Commercial
- Social
- Religion
- Traffic
- Moving elements

DIAGRAM OF VARIABLE ROOM LAYOUTS AND CIRCULATION

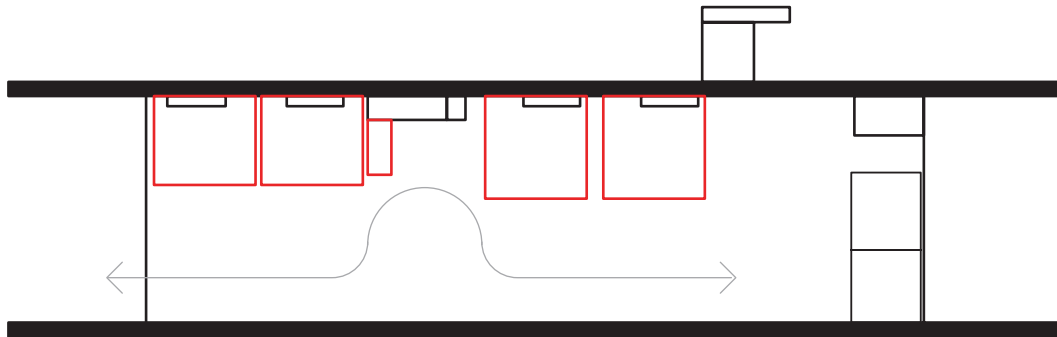
Section



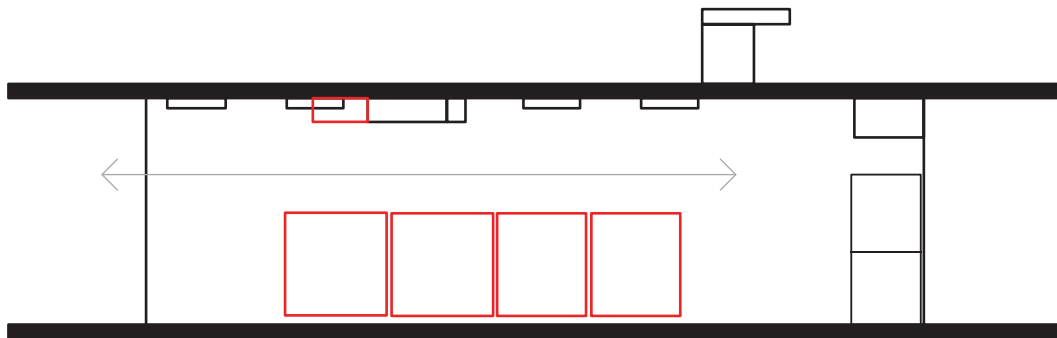
Layout 1



Layout 2



Layout 3



Placeholder

FLEXIBILITY CATEGORIES (as defined by..)	
Forty	Flexibility by Redundancy
	Flexibility by Technical Means
	Flexibility as a Political Strategy
MOTIVE	
	economical
	sociological
	spatial quality
	spatially economical
	entertainment
	cultural
	commercial advertorial
	legal
SPATIAL PROFITEUR	
	people
	storage
CONTEXT	
	urban
	rural
COMBINATIONS OF USE	
amount	>5
programmes and their spatial use of floor area	dining n.a.
in percentage of the whole building	boy n.a.
	girl n.a.
	circulation n.a.
	bathroom n.a.
sum	n.a.
sum can exceed 100% if occupations take place at different times	
PATTERNS OF USE (TIME-RELATED)	
	strict (sharp steps)
	soft (curvy hills)
CONTROL - PARTICIPATION	
	top-down
	bottom-up
	evolutionary (learning)
PROJECT STATUS	
	built
	paperproject
SPATIAL DISTRIBUTION	
	internal <--> internal
	internal <--> external
	space invasive (e.g. Shigeru Ban)
CHANGING ENTITY	
	support / structure (Habraken)
	infill / furniture (Habraken)
	infrastructure / media
	armour / bodyextension (Kurokawa)
CHANGE	
	change of roomsize
	movement of compartments
	implant
	number of user(groups) affected
	4
EXPANSION / SHRINKAGE DIRECTION	
	horizontal
	vertical
	other (e.g.rotating)
TECHNICAL CHANGE THROUGH	
	kinetical / mechanical
	chemical / biological
	thermal
	informational
RESPONSE SPEED	
sec / min / h / d / weeks / month / years	5 minutes
FURTHER CATEGORIES	
overall size [m]	10x8x6
relevance of daylight	high
relevance of freshair	high
lighting depth (estimation)	6 m

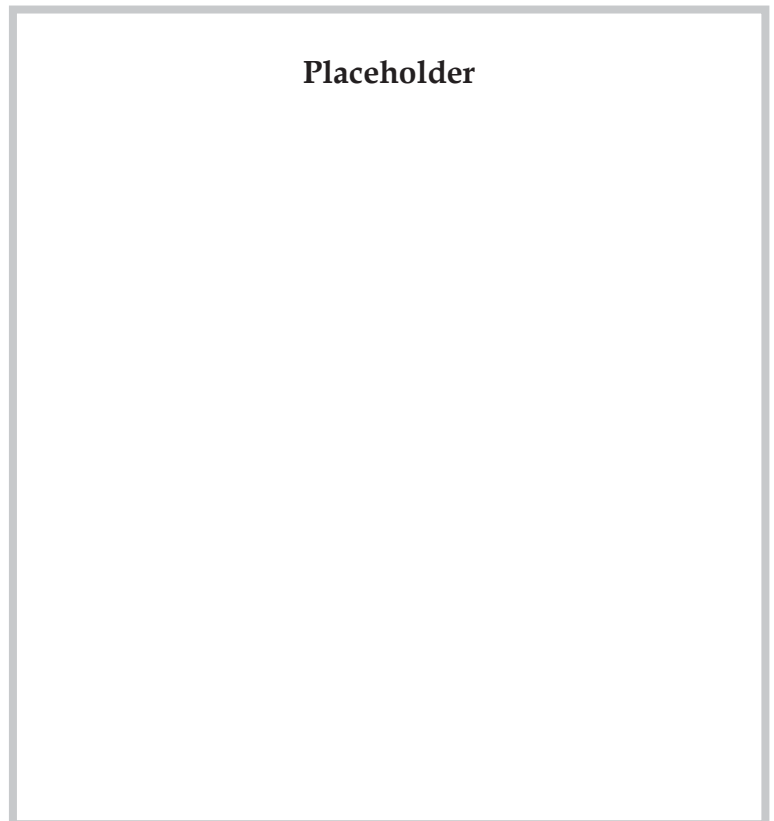
Flexibility by Technical Means #5

Schröder House
Utrecht, The Netherlands
Gerrit Rietveld
1924

The Schröder House was commissioned to Rietveld to be almost a house without walls. This is achieved on the first floor, where an open space is only divided by sliding and rotating partitions. There are multiple configurations possible. In its most partitioned configuration it consists of three bedrooms, one bathroom and one sitting-room.

This is a truly flexible space by technical means.

Isonometric view



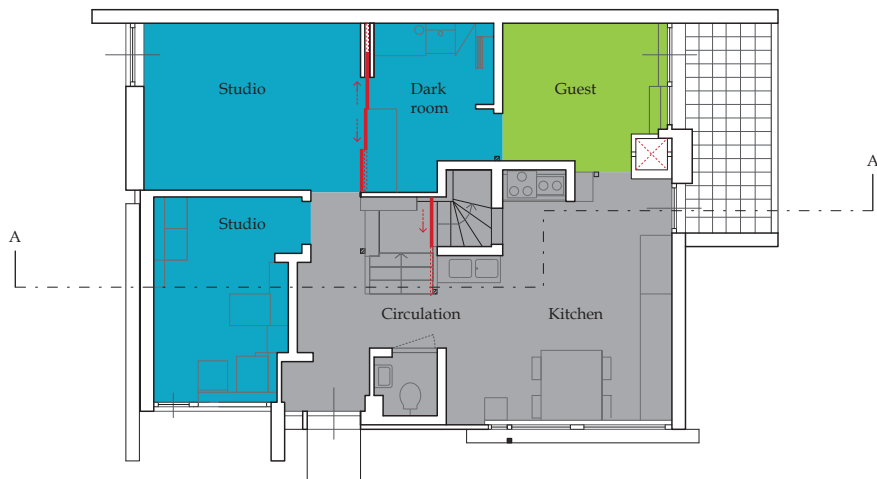
Placeholder

- Residential
- Leisure
- Commercial
- Social
- Religion
- Traffic
- Moving elements

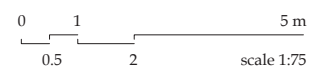
Section A - A'



Ground floor plan



First floor plan



Placeholder

FLEXIBILITY CATEGORIES (as defined by..)	
Forty	Flexibility by Redundancy
	Flexibility by Technical Means
	Flexibility as a Political Strategy
MOTIVE	
	economical
	sociological
	spatial quality
	spatially economical
	entertainment
	cultural
	commercial advertorial
	legal
SPATIAL PROFITEUR	
	people
	storage
CONTEXT	
	urban
	rural
COMBINATIONS OF USE	
amount	plenty
programmes and their spatial use of floor area	dining n.a.
in percentage of the whole building	bedroom n.a.
	bathroom n.a.
	kitchen n.a.
	etc. n.a.
sum	n.a.
sum can exceed 100% if occupations take place at different times	
PATTERNS OF USE (TIME-RELATED)	
	strict (sharp steps)
	soft (curvy hills)
CONTROL - PARTICIPATION	
	top-down
	bottom-up
	evolutionary (learning)
PROJECT STATUS	
	built
	paperproject
SPATIAL DISTRIBUTION	
	internal <-> internal
	internal <-> external
	space invasive (e.g. Shigeru Ban)
CHANGING ENTITY	
	support / structure (Habraken)
	infill / furniture (Habraken)
	infrastructure / media
	armour / bodyextension (Kurokawa)
CHANGE	
	change of roomsize
	movement of compartments
	implant
number of user(groups) affected	1
EXPANSION / SHRINKAGE DIRECTION	
	horizontal
	vertical
	other (e.g. rotating)
TECHNICAL CHANGE THROUGH	
	kinetical / mechanical
	chemical / biological
	thermal
	informational
RESPONSE SPEED	
sec / min / h / d / weeks / month / years	5 minutes
FURTHER CATEGORIES	
overall size [m]	8x4x3
relevance of daylight	high
relevance of freshair	high
lighting depth (estimation)	6 m

Flexibility by Technical Means #6

Hong Kong Micro Apartment

Hong Kong, China

Gary Chang

2006

Architect Gary Chang's apartment is located in downtown Hong Kong, and represents a remarkable example of interior refurbishment. With only 32 sqm, Chang studied the different distribution possibilities to optimize his space. Chang has been living in this apartment since he was 14 years old. After his parents moved out, he tried a series of modifications.

<http://www.detail.de/research/forschung-entwicklung/vertikale-nischen-miniwohnungen-in-megacities-von-gary-chang-021703.html>
<http://www.archivvenue.com/gary-changs-24-rooms-in-a-32sqm-apartment/>

Space modification through time

Placeholder

1976

14

1

1987

24

11

1989

26

13

1998

35

22

2006

43

30



Residential



Leisure



Commercial



Social



Religion



Traffic



Moving elements

Single activities



Placeholder

bedtime

bedtime - with enclosed room

guest bedroom

guest bedroom



Placeholder

walk-in closet

enclosed bathroom with
toilet shower & wardrobe

home spa

2 bedrooms



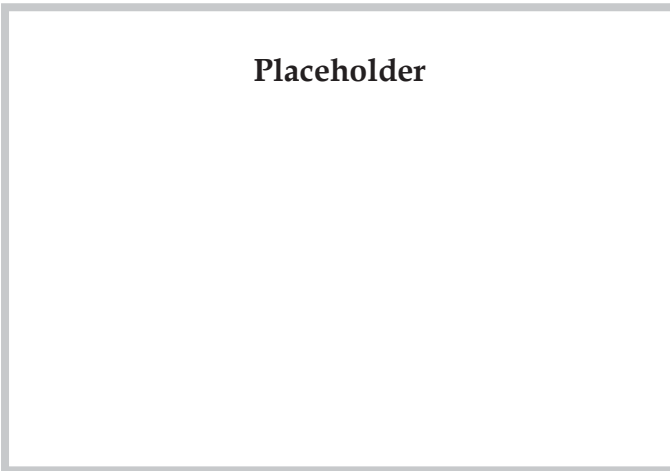
Placeholder

labyrinth

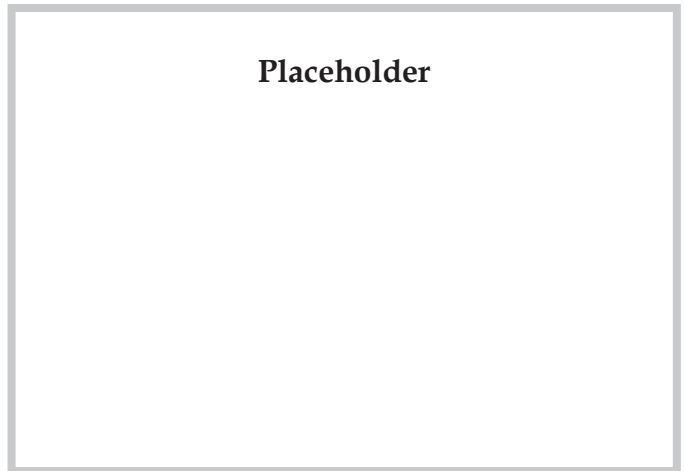
tv game

3 rooms

yoga



Placeholder



Placeholder

Collective activities



Placeholder

dining

enclosed dining

maximum kitchen

laundry



Placeholder

library

study

study-oblique mode

study
with onscreen projected on screen



Placeholder

hammock

cinema

video game with 8 spectators

cocktail party (max. 20)

Placeholder

Flexibility as Political Strategy #1

Mezquita Catedral

Cordoba, Spain

Anonymous

987 (1st'completion')

The name Mezquita-Catedral (Mosque-Cathedral) denotes already the process that the building went through centuries changing from a mosque into a catholic church.

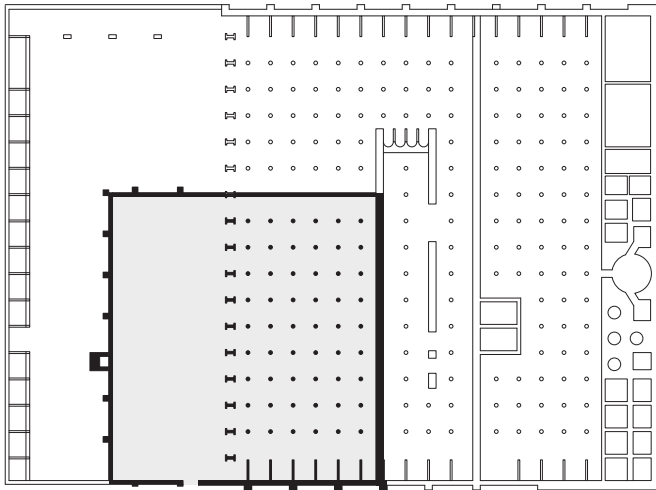
There is a dispute that lasts until today where Muslims would like to be able to pray in this building. This has even led to a physical fight between Muslim visitors and guards in 2010. The wish for flexibility becomes a motive of conflict. The building has changed due to the religious transformation it went through, from one religion to another. Its flexibility was dictated by political decisions.

Internal View

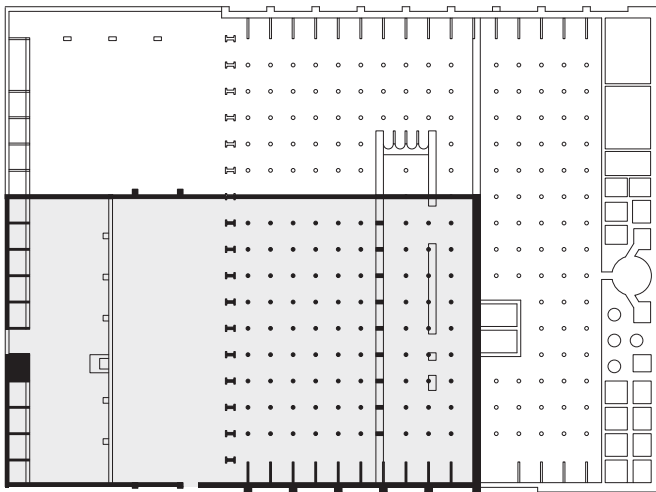
Placeholder

FLEXIBILITY CATEGORIES (as defined by..)	
Forty	Flexibility by Redundancy
	Flexibility by Technical Means
	Flexibility as a Political Strategy
MOTIVE	
	economical
	sociological
	spatial quality
	spatially economical
	entertainment
	cultural
	commercial advertorial
	legal
SPATIAL PROFITEUR	
	people
	storage
CONTEXT	
	urban
	rural
COMBINATIONS OF USE	
amount	2
programmes and their spatial use of floor area	mosque 50%
in percentage of the whole building	church 50%
	/ 0%
	/ 0%
	/ 0%
sum	100%
sum can exceed 100% if occupations take place at different times	
PATTERNS OF USE (TIME-RELATED)	
	strict (sharp steps)
	soft (curvy hills)
CONTROL - PARTICIPATION	
	top-down
	bottom-up
	evolutionary (learning)
PROJECT STATUS	
	built
	paperproject
SPATIAL DISTRIBUTION	
	internal <-> internal
	internal <-> external
	space invasive (e.g. Shigeru Ban)
CHANGING ENTITY	
	support / structure (Habracken)
	infill / furniture (Habracken)
	infrastructure / media
	armour / bodyextension (Kurokawa)
CHANGE	
	change of roomsize
	movement of compartments
	implant
	number of user(groups) affected
	2
EXPANSION / SHRINKAGE DIRECTION	
	horizontal
	vertical
	other (e.g.rotating)
TECHNICAL CHANGE THROUGH	
	kinetical / mechanical
	chemical / biological
	thermal
	informational
RESPONSE SPEED	
sec / min / h / d / weeks / month / years	250 years
FURTHER CATEGORIES	
	overall size [m]
	relevance of daylight
	relevance of freshair
	lighting depth (estimation)
	none
	average
	undefined

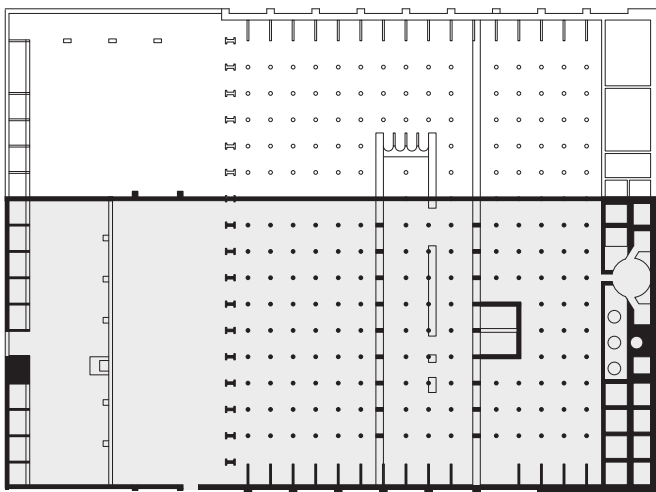
- Residential
- Leisure
- Commercial
- Social
- Religion
- Traffic
- Moving elements



PRIMITIVE CONSTRUCTION
780



FIRST EXTENSION
833 - 855



SECOND EXTENSION - THIRD EXTENSION
961 - 987



Placeholder

Flexibility as Political Strategy #2

Kowloon Walled City
Hong-Kong (British enclave)
Anonymous
1898 - 1993 (demolished)

FLEXIBILITY CATEGORIES (as defined by..)	
Forty	Flexibility by Redundancy
	Flexibility by Technical Means
	Flexibility as a Political Strategy
MOTIVE	
	economical
	sociological
	spatial quality
	spatially economical
	entertainment
	cultural
	commercial advertorial
	legal
SPATIAL PROFITEUR	
	people
	storage
CONTEXT	
	urban
	rural
COMBINATIONS OF USE	
amount	plenty
programmes and their spatial use of floor area	residential n.a.
in percentage of the whole building	work n.a.
	entertainm. n.a.
	supermkt. n.a.
	manv more n.a.
sum	n.a.
sum can exceed 100% if occupations take place at different times	
PATTERNS OF USE (TIME-RELATED)	
	strict (sharp steps)
	soft (curvy hills)
CONTROL - PARTICIPATION	
	top-down
	bottom-up
	evolutionary (learning)
PROJECT STATUS	
	built
	paperproject
SPATIAL DISTRIBUTION	
	internal <-> internal
	internal <-> external
	space invasive (e.g. Shigetsu Ban)
CHANGING ENTITY	
	support / structure (Habracken)
	infill / furniture (Habracken)
	infrastructure / media
	armour / bodyextension (Kurokawa)
CHANGE	
	change of roomsize
	movement of compartments
	implant
	number of user(groups) affected
	plenty
EXPANSION / SHRINKAGE DIRECTION	
	horizontal
	vertical
	other (e.g.rotating)
TECHNICAL CHANGE THROUGH	
	kinetical / mechanical
	chemical / biological
	thermal
	informational
RESPONSE SPEED	
sec / min / h / d / weeks / month / years	10s to 20 years
FURTHER CATEGORIES	
overall size [m]	200 x 100 x 30
relevance of daylight	none
relevance of freshair	none
lighting depth (estimation)	undefined

The Kowloon Walled City in Hong-Kong consisted of a city block that contained over 300 high-rise buildings, all interconnected, that hosted circa 33,000 people. Due to a complex history between British and Chinese authorities, the Kowloon Walled City became a place where there was little government enforcement from both sides. From the 1950s Triad groups were powerful here, making it a crime haven, and only in the 1970s this issue started to be tackled.

However throughout decades, most of the inhabitants of the city lead normal lives just like other Hong-Kong inhabitants.

'Conventional boundaries defining typologies were blurred as unstable programmes changed both their spatial and functional characteristics. A cafeteria would transform into a mah-jong parlour at certain hours, while a plastic toy factory doubled as an illegal drugs den.' 'There was also a mix of programmes both in plan and in section.

The structure presents, on the one hand, flexibility through appropriation - different uses of the same space according to different users and times of the day. There was a bottom-up approach to infrastructure since individual wills of use dictated the necessary infrastructure to arrive to spaces a posteriori (health and safety regulations were not taken into account). This approach is oppositional to the conventional approach to infrastructure in a building where infrastructure is planned in the first place and spaces are served by it. In Kowloon Walled City, infrastructure was something flexible that would follow immediate changing necessities.

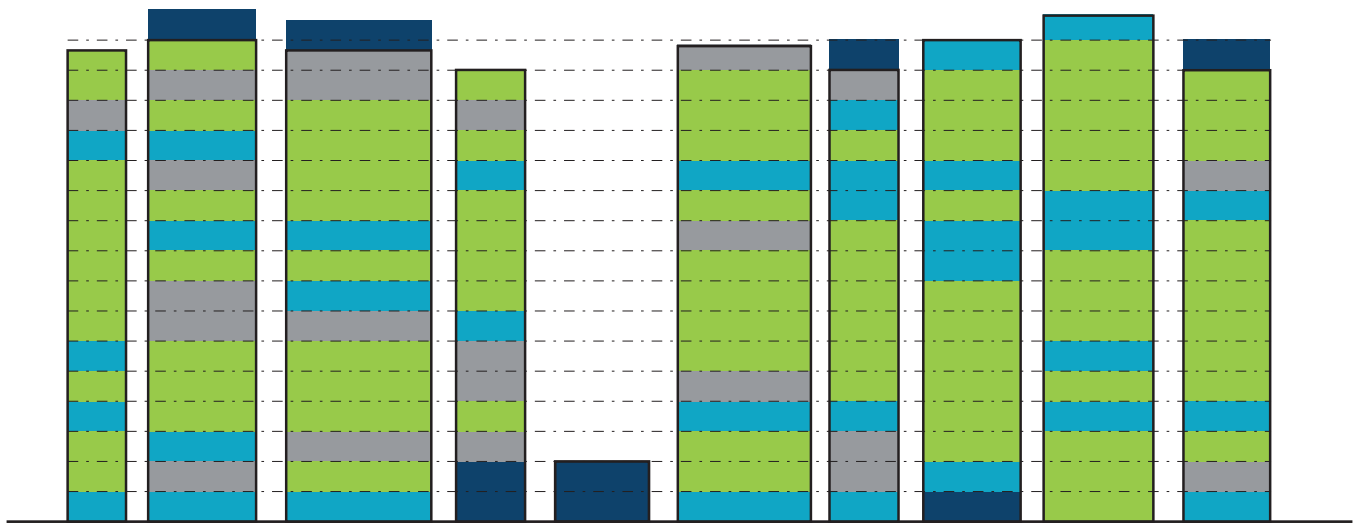
Winy Maas and others, FARMAX: Excursions on Density (Rotterdam: 010 Publishers, 2006), p. 156.

West Side Street (with Overhead Pipes), 1990

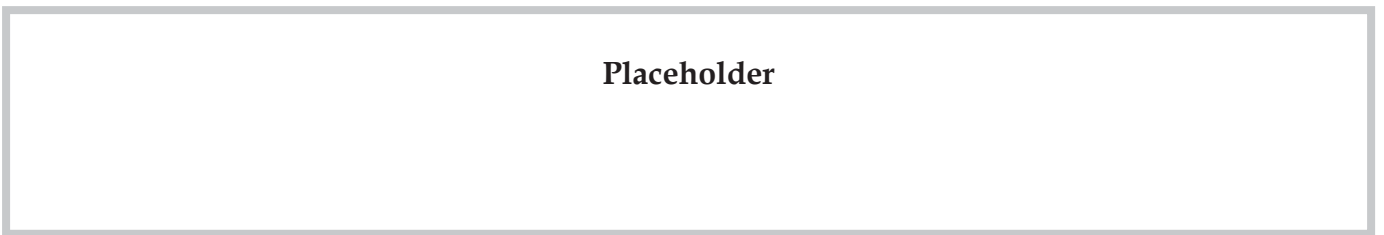
Placeholder

- Residential
- Mixed
- Commercial
- Social
- Religion
- Traffic
- Moving elements

Vertical discontinuity of programs produce both horizontal and vertical social intercourse



City's extension phases

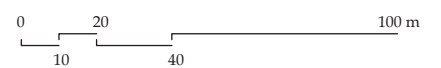
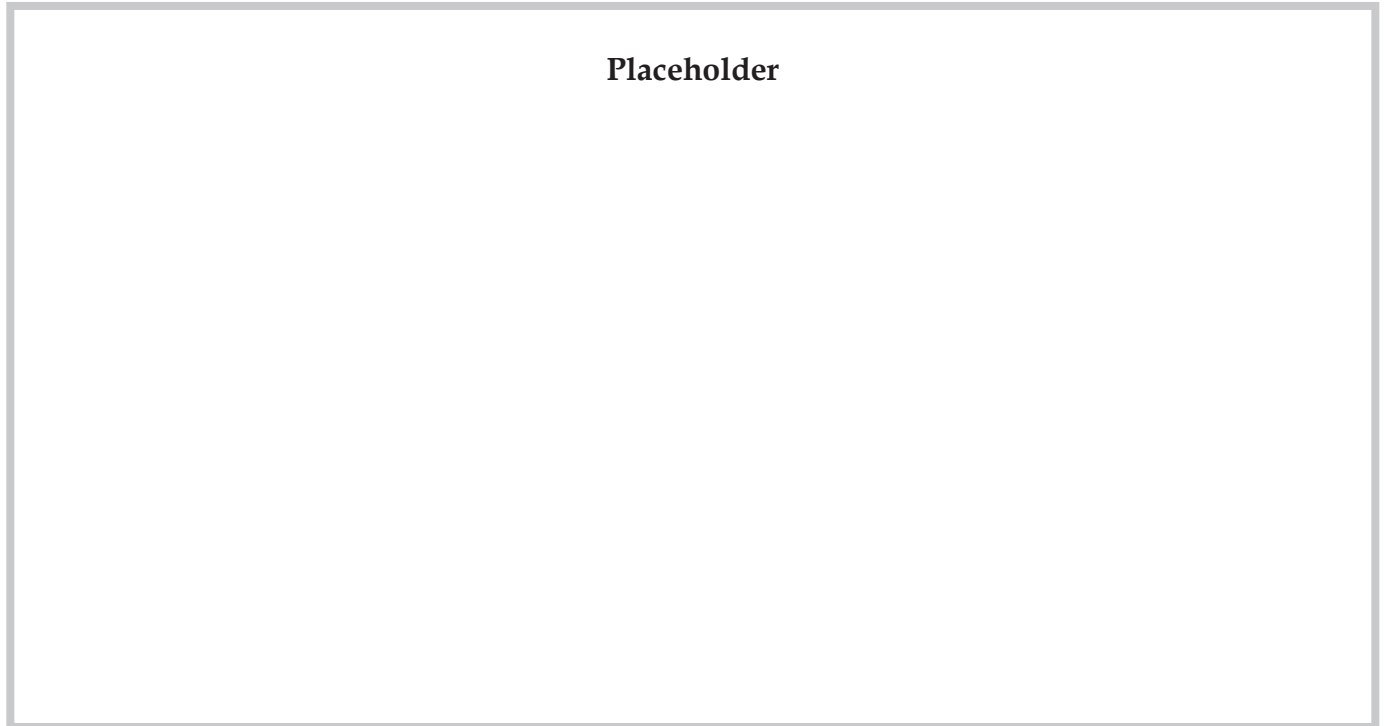


1847

1940

1965

1973



APPENDIX A.2 - INTERVIEWS (RE. CH. 4)

A.2.1 INTERVIEW WITH MR BAUMGART

A.2.2 INTERVIEW WITH MR WARNECKE

Interview 1 Personal Interview

Interviewer: Florian Wurfbaum

Interviewee: Mr Hans-Jürgen Baumgart,
Leiter Hausservice Ost (Head of facility services East)
Baureferat der Stadt München (Department for municipal buildings, city of Munich)

Location: Baureferat der Stadt München, Zimmer 0130 (Room 0130)
Friedenstraße 40
81671 München

Time: 24. August 2011, 8:30am

Informal Interview Summary

At the beginning I again explained the motive of the interview to Mr Baumgart (patterns of use for different building typologies).

I asked Mr Baumgart, if he could give me information about the patterns of use of the administration building in Friedenstraße 40, about the attendance time of the staff and when they are in the building.

Mr Baumgart explained that staff in Munich's department for buildings and infrastructure (Baureferat) work flexible hours, meaning that they can plan their working days freely, as long as they are there in the core hours between 9:30am and 2:30pm. Early staff could start at 6am in the morning and late staff could stay until 6:30pm or 7pm.

I asked Mr Baumgart, if he could estimate how many staff come early and how many work late.

Mr Baumgart said, not many come very early or stay very late. The majority works from 7:30am to around 4:30pm, Fridays shorter, until around 2pm to 3pm (early afternoon).

I asked Mr Baumgart if it doesn't occur that staff stay longer in the office in the evenings.

He said that very rarely single members of staff would stay in the building longer in the evening, e.g. until 9pm and even more rarely someone is in at weekends.

I asked if Mr Baumgart could estimate the amount of staff being in the building outside the time when the majority is in.

He said that he estimates that before 7:30am and after 5:30pm very few staff are in the building, probably no more than 5%.

I asked about the top management, if their work schedule differs from the normal staff, but Mr Baumgart couldn't answer this question.

I asked if there are people other than administration staff that stay in the building.

He said there is the security service, that is present from 6am until 10pm. Sometimes single rooms, e.g. meeting/seminar rooms, the canteen or the large entrance hall are being rented out to external users for special events, seminars or similar occasions, but without a strict schedule.

I also asked about the underground parking, he said it is in use at the same time as the opening and working hours of the Baureferat.

I asked Mr Baumgart about the operation time of the heating system of the entire building but he said he doesn't have access to those records.

Interview 2 Telephone Interview

Between: Florian Wurfbaum (caller)

and: Mr Tobias Warnecke, Referent (Consultant)
Hotelverband Deutschland (IHA)
(German hotel association/ national trade association for the hotel industry)
Am Weidendamm 1A
10117 Berlin

Time: 2. June 2014, 11:30am

Informal Interview Summary

I introduced myself and explained to Mr Warnecke that I am collecting occupation patterns for different kinds of buildings and that I would like to ask him some questions about hotels and their occupation. He agreed to have a short conversation with me.

I told Mr Warnecke that I was looking for information about business hotels and their occupancy during the course of one week. Mr Warnecke told me that in their institution they don't have any study specially about that, but that business hotels are in general more busy on weekdays. All weekdays have a similar range of occupation and Tuesday is likely to be the strongest day. Weekends are not so busy unless the hotel is located in a touristically attractive major city, when weekend guests come. He told me that business hotels in attractive cities have a good booking quota, where Tuesday is likely the strongest night and Sunday being the weakest night. I asked Mr Warnecke about the duration of stays at business hotels, he said that business guests during the week predominantly stay for one night only. Mr Warnecke told me he would send me their study on the hotel market in Germany. I received the study and found confirming indications.¹

¹ Tobias Warnecke and Markus Luthé, 'Hotelmarkt Deutschland 2014' (IHA-Service GmbH, 2014), p. 92.

APPENDIX A.3 - SURVEY (RE. CH. 4)

A.3.1 SURVEY QUESTIONNAIRE

A.3.2 SURVEY QUESTIONNAIRES FILLED-OUT

A.3.3 SURVEY QUESTIONNAIRES TIME RECORDING SPREADSHEET

A.3.4 SURVEY OTHER EVALUATIONS

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue .

Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 Do you live in a one - person household? Yes No
 Leben Sie in einem Ein- Personen Haushalt? Ja Nein

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (tick the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days. Tick/untick boxes for times when you are at your house, leave boxes plain for times you spend out of house (in excel change colour). Some boxes are pre-ticked to common userpatterns, please remove / add according to your personal records.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (kreuzen Sie die jeweiligen Zeitabschnitte an). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren. Die Tagespläne sind entsprechend einem häufigen Nutzungsmuster vor- ausgefüllt, bitte entfernen / fügen Sie Kreuzchen entsprechend Ihrem persönlichen Tagesverlauf zu.

Time Uhrzeit	from		until		Day Tag select days Tage wählen
	0:00	0:30	0:30	1:00	
0:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3 Would you estimate the week you recorded above as a typical and representative week? Yes No
 Denken Sie, daß die oben aufgezeichnete Woche eine typische und repräsentative Woche ist? Ja Nein

If Yes: Please continue with question 4.

Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness...

Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. Urlaub, Überstunden, Krankheit....)

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week

b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

Time Uhrzeit	from		until		Day Tag
	0:00	0:30	0:30	1:00	
0:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
17:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
17:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
18:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
18:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
19:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
19:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
20:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
20:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
21:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
21:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
22:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
22:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
23:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
23:30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

tick/untick boxes for times when you are at your house, leave boxes plain for times you spend out of house (in excel change colour).
 bitte kreuzen Sie die Zeiten an, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.

Monday

Montag

Tuesday

Dienstag

Wednesday

Mittwoch

Thursday

Donnerstag

Friday

Freitag

Saturday

Samstag

Sunday

Sonntag

16 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- Bedrooms
Schlafzimmer
- Livingrooms
Wohnzimmer
- Kitchen or Kitchen-Diner
Küche oder Wohnküche
- Bathroom
Badezimmer
- WC (separate)
Extra WC
-

other rooms: (please state)
andere Zimmer (bitte nennen)

17 How big is your flat / house? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Wie groß ist Ihre Wohnung / Ihr Haus? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

18 For how long have you been living in your current flat/house? Months Years
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Monate Jahre

19 From now, for how long are you planning to keep staying in the flat/house you currently live in? Months Years
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Monate Jahre

20 Do you own or do you rent the place you live in? own rent
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? Eigentümer/In Mieter/In

21 Do you use any of these items? MP3 Player Tablet PC (iPad) Smartphone Kindle or other eReader
Benutzen Sie eines dieser Geräte? MP3 Spieler Tablett PC (z.B. iPad) Smartphone Kindle oder anderes E-Lesegerät

22 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?

Not likely at all unlikely don't know likely very likely
Überhaupt nicht wahrscheinlich unwahrscheinlich ich weiß nicht wahrscheinlich sehr wahrscheinlich

23 Do you store any data in the cloud? I don't know what the cloud is Yes No
Speichern Sie Daten in der Cloud? Ich weiß nicht was die Cloud ist Ja Nein

24 Are you on Facebook or any other social network? I don't know what Facebook is Yes No
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? Ich weiß nicht was Facebook ist Ja Nein

25 How many hours of your free time do you spend per week on the internet? Hours/Week
Wie viel Freizeit verbringen Sie im Internet? Stunden / Woche

26 Personal information: Gender? female male
Persönliche Informationen: Geschlecht weiblich männlich

Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
Alter

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

- a) Safe as pdf document under a different name and send to florian.wurfbaum@network.rca.ac.uk
Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) automated return, klick here:
Automatische Antwort, hier klicken:
- c) Print out and fax to: +49 (0)89.95 474 526
Drucken Sie den Fragebogen aus und faxen ihn an:

Dwelling Utilisation Survey - Wohngebäude- Nutzungs- Umfrage

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue. Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 How many persons all together live in your household? 1 (Me) 2 3 4 5 if more: Persons

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (mark the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (markieren Sie die jeweiligen Zeitabschnitte). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren.

Table with columns for Date (dd/mm) and Time (Uhrzeit) from 0:00 to 23:30. Rows for dates 9.2.14, 10.2., 11.2., 12.2., 13.2., 14.2., 15.2. are filled with 'X' marks.

3 Would you estimate the week you recorded above as a typical and representative week? Yes No

If Yes: Please continue with question 4. Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness... Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. wg. Urlaub, Überstunden, Krankheit....)

Empty text box for providing reasons for 'No'.

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

Table for recording typical week with columns for Day (Monday-Sunday) and Time (Uhrzeit) from 0:00 to 23:30. All cells are empty.

4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No
 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein

If yes: Please continue with question 5.
 Wenn ja: weiter mit Frage 5

If no: Please go to question 6.
 Wenn Nein: weiter mit Frage 6

5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	mark boxes for times when you are at your house, leave boxes plain for times you spend out of house. bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.	
		from	until
Monday Montag	0:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	0:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	1:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	1:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	2:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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	22:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	23:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	23:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	0:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

6 Employment status employed self-employed unemployed student in training
 Erwerbsstatus angestellt selbständig ohne Anstellung Student/in in Ausbildung

retired other, please state

Rentner anderes, bitte angeben

7 Do you work full-time? part-time? without clearly defined timeframe?
 Arbeiten Sie Vollzeit Teilzeit ohne fixe Arbeitszeiten

8 Do you work at home, even if it's just occasionally? Yes No
 Arbeiten Sie (wenn auch nur gelegentlich) von zu Hause? Ja Nein

9 If Yes, how many hours on these days on average? Mo Tu We Th Fr Sa Su
 Wenn Ja, wie viele Stunden an diesen Tagen durchschnittlich? Mo Di Mi Do Fr Sa So

10 Do you regularly stay overnight away from home for businessstrips or similar? Yes No
 Verbringen Sie auf Geschäftsreisen oder ähnlichem regelmäßig Nächte außerhalb Ihrer Wohnung? Ja Nein

11 If yes, how many nights per month do you spend on average outside your flat? Days / Month
 Wenn Ja, wie viele Nächte pro Monat verbringen Sie durchschnittlich ausserhalb Ihrer Wohnung? Tage / Monat

12 Roughly, how many days of holiday do you take per year? Days
 Wie viele Urlaubstage nehmen Sie ungefähr pro Jahr? Tage

13 Out of these holidays, how many days and nights do you spend away from your home? Days
 Von diesen Urlaubstagen, wie viele Tage und Nächte verbringen Sie nicht zu Hause (z.B. auf Reise im Hotel o.ä...)? Tage

14 Where is your house/flat? Postcode City Country
 Wo ist Ihre Wohnung / Ihr Haus? PLZ Ort Land

1c

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- Bedrooms
Schlafzimmer
- Livingrooms
Wohnzimmer
- Kitchen or Kitchen-Diner
Küche oder Wohnküche
- Bathroom
Badezimmer
- WC (separate)
Extra WC
- Wanderräume

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Größe ihrer Wohnung / ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Months
Monate Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player
MP3 Spieler Tablet PC (iPad)
Tablett PC (z.B. iPad) Smartphone
Smartphone Kindle or other eReader
Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?

Not likely at all Überhaupt nicht wahrscheinlich
unlikely unwahrscheinlich
don't know ich weiß nicht
likely wahrscheinlich
very likely sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is
Ich weiß nicht was die Cloud ist Yes
Ja No
Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is
Ich weiß nicht was Facebook ist Yes
Ja No
Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? Hours/Week
Stunden / Woche

25 Personal information: Gender? female
weiblich male
männlich
Personal information: Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
Alter

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

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Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) Print out and fax to: +49 (0)89.95 474 526
Drucken Sie den Fragebogen aus und faxen ihn an:

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

- 4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No
 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein
- If yes: Please continue with question 5. If no: Please go to question 6.
 Wenn ja: weiter mit Frage 5 Wenn Nein: weiter mit Frage 6

- 5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	mark boxes for times when you are at your house, leave boxes plain for times you spend out of house. bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.	
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	0:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

- 6 Employment status employed self-employed unemployed student in training
 Erwerbsstatus angestellt selbstständig ohne Anstellung Student/in in Ausbildung
- retired other, please state
 Rentner anderes, bitte angeben

- 7 Do you work full-time? part-time? without clearly defined timeframe?
 Arbeiten Sie Vollzeit Teilzeit ohne fixe Arbeitszeiten

- 8 Do you work at home, even if it's just occasionally? Yes No
 Arbeiten Sie (wenn auch nur gelegentlich) von zu Hause? Ja Nein

- 9 If Yes, how many hours on these days on average? Mo Tu We Th Fr Sa Su
 Wenn Ja, wie viele Stunden an diesen Tagen durchschnittlich? Mo Di Mi Do Fr Sa So

- 10 Do you regularly stay overnight away from home for businessstrips or similar? Yes No
 Verbringen Sie auf Geschäftsreisen oder ähnlichem regelmäßig Nächte außerhalb Ihrer Wohnung? Ja Nein

- 11 If yes, how many nights per month do you spend on average outside your flat? Days / Month
 Wenn Ja, wie viele Nächte pro Monat verbringen Sie durchschnittlich ausserhalb Ihrer Wohnung? Tage / Monat

- 12 Roughly, how many days of holiday do you take per year? Days
 Wie viele Urlaubstage nehmen Sie ungefähr pro Jahr? Tage

- 13 Out of these holidays, how many days and nights do you spend away from your home? Days
 Von diesen Urlaubstagen, wie viele Tage und Nächte verbringen Sie nicht zu Hause (z.B. auf Reise im Hotel o.ä...)? Tage

- 14 Where is your house/flat? Postcode City Country
 Wo ist Ihre Wohnung / Ihr Haus? PLZ Ort Land

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- 2 Bedrooms
Schlafzimmer
- 1 Livingrooms
Wohnzimmer
- 1 Kitchen or Kitchen-Diner
Küche oder Wohnküche
- 1 Bathroom
Badezimmer
- 1 WC (separate)
Extra WC
-

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²

Größe ihrer Wohnung /Ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate 21 Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Months
Monate 10 Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player
MP3 Spieler Tablet PC (iPad)
Tablett PC (z.B. iPad) Smartphone
Smartphone Kindle or other eReader
Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?

Not likely at all unlikely don't know likely very likely

Überhaupt nicht wahrscheinlich unwahrscheinlich ich weiß nicht wahrscheinlich sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is
Ich weiß nicht was die Cloud ist Yes
Ja No
Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is
Ich weiß nicht was Facebook ist Yes
Ja No
Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? 10 Hours/Week
Stunden / Woche

25 Personal information: Gender? female male
Persönliche Informationen: Geschlecht weiblich männlich

Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
Alter

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

- a) Safe as pdf document and send to florian.wurfbaum@network.rca.ac.uk
Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) Print out and fax to: +49 (0)89.95 474 526
Drucken Sie den Fragebogen aus und faxen ihn an:

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

Dwelling Utilisation Survey - Wohngebäude- Nutzungs- Umfrage

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue.
 Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 How many persons all together live in your household? 1 (Me) 2 3 4 5 if more: 2 Persons
 Wie viele Personen insgesamt leben in Ihrem Haushalt? 1 (ich) 2 3 4 5 falls mehr: Personen

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (mark the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (markieren Sie die jeweiligen Zeitabschnitte). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren.

Time Uhrzeit	until		from		Date (dd/mm) Datum (tt/mm)
	0:30	1:00	0:00	0:30	
0:30					08.2.14
1:00					09.2.14
1:30					10.2.14
2:00					11.2.14
2:30					12.2.14
3:00					13.2.14
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0:00					

3 Would you estimate the week you recorded above as a typical and representative week? Yes No
 Denken Sie, daß die oben aufgezeichnete Woche eine typische und repräsentative Woche ist? Ja Nein

If Yes: Please continue with question 4.
 Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness...
 Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. wg. Urlaub, Überstunden, Krankheit...)

2 jobs, untypischer An- und Abkluft

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week
 b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

Day Tag	until		from	
	0:30	1:00	0:00	0:30
Monday Montag				
Tuesday Dienstag				
Wednesday Mittwoch				
Thursday Donnerstag				
Friday Freitag				
Saturday Samstag				
Sunday Sonntag				

So wie von 08.2.2014 - 14.02.2014 beschrieben

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- Bedrooms
Schlafzimmer
- Livingrooms
Wohnzimmer
- Kitchen or Kitchen-Diner
Küche oder Wohnküche
- Bathroom
Badezimmer
- WC (separate)
Extra WC

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Größe Ihrer Wohnung /ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Months
Monate ? Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player
MP3 Spieler Tablet PC (iPad)
Tablett PC (z.B. iPad) Smartphone
Smartphone Kindle or other eReader
Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?

Not likely at all
Überhaupt nicht wahrscheinlich unlikely
unwahrscheinlich don't know
ich weiß nicht likely
wahrscheinlich very likely
sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is
Ich weiß nicht was die Cloud ist Yes
Ja No
Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is
Ich weiß nicht was Facebook ist Yes
Ja No
Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? Hours/Week
Stunden / Woche

25 Personal information: Gender? female
weiblich male
männlich
Persönliche Informationen: Geschlecht
Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
Alter

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

- a) Safe as pdf document and send to
Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) Print out
Drucken Sie den Fragebogen aus

florian.wurfbaum@network.rca.ac.uk
x nem, gebe ich pers ab.
and fax to: +49 (0)89.95 474 526
und faxen ihn an:
nem

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

Dwelling Utilisation Survey - Wohngebäude- Nutzungs- Umfrage

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue.
 Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 How many persons all together live in your household? 1 (Me) 2 3 4 5 if more: Persons
 Wie viele Personen insgesamt leben in Ihrem Haushalt? 1 (Ich) 2 3 4 5 falls mehr: Personen

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (mark the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (markieren Sie die jeweiligen Zeitabschnitte). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren.

Time Uhrzeit	from		until		Date (dd/mm) Datum (tt/mm)
	from	until	from	until	
	0:00	0:30	0:00	0:30	
	0:30	1:00	0:30	1:00	
	1:00	1:30	1:00	1:30	
	1:30	2:00	1:30	2:00	
	2:00	2:30	2:00	2:30	
	2:30	3:00	2:30	3:00	
	3:00	3:30	3:00	3:30	
	3:30	4:00	3:30	4:00	
	4:00	4:30	4:00	4:30	
	4:30	5:00	4:30	5:00	
	5:00	5:30	5:00	5:30	
	5:30	6:00	5:30	6:00	
	6:00	6:30	6:00	6:30	
	6:30	7:00	6:30	7:00	
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	14:30	15:00	14:30	15:00	
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	21:30	22:00	21:30	22:00	
	22:00	22:30	22:00	22:30	
	22:30	23:00	22:30	23:00	
	23:00	23:30	23:00	23:30	
	23:30	0:00	23:30	0:00	

3 Would you estimate the week you recorded above as a typical and representative week? Yes No
 Denken Sie, daß die oben aufgezeichnete Woche eine typische und repräsentative Woche ist? Ja Nein

If Yes: Please continue with question 4.
 Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness...
 Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. wg. Urlaub, Überstunden, Krankheit...)

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week
 b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

Day Tag	Time Uhrzeit	from		until	
		from	until	from	until
Monday Montag		0:00	0:30	0:00	0:30
Tuesday Dienstag		0:30	1:00	0:30	1:00
Wednesday Mittwoch		1:00	1:30	1:00	1:30
Thursday Donnerstag		1:30	2:00	1:30	2:00
Friday Freitag		2:00	2:30	2:00	2:30
Saturday Samstag		2:30	3:00	2:30	3:00
Sunday Sonntag		3:00	3:30	3:00	3:30
		3:30	4:00	3:30	4:00
		4:00	4:30	4:00	4:30
		4:30	5:00	4:30	5:00
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		22:00	22:30	22:00	22:30
		22:30	23:00	22:30	23:00
		23:00	23:30	23:00	23:30
		23:30	0:00	23:30	0:00

4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No
 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein

If yes: Please continue with question 5. If no: Please go to question 6.
 Wenn ja: weiter mit Frage 5 Wenn Nein: weiter mit Frage 6

5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	mark boxes for times when you are at your house, leave boxes plain for times you spend out of house. bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.	
		from	until
Monday Montag	0:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	0:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	1:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	1:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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	20:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	20:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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	22:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	22:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	23:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	23:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	0:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

6 Employment status employed angestellt self-employed selbständig unemployed ohne Anstellung student Student/In in training in Ausbildung
 Erwerbsstatus retired Rentner other, please state anderes, bitte angeben

7 Do you work full-time? Vollzeit part-time? Teilzeit without clearly defined timeframe? ohne fixe Arbeitszeiten
 Arbeiten Sie

8 Do you work at home, even if it's just occasionally? Yes No
 Arbeiten Sie (wenn auch nur gelegentlich) von zu Hause? Ja Nein

9 If Yes, how many hours on these days on average? Mo Tu We Th Fr Sa Su
 Wenn Ja, wie viele Stunden an diesen Tagen durchschnittlich? Mo Di Mi Do Fr Sa So

10 Do you regularly stay overnight away from home for business trips or similar? Yes No
 Verbringen Sie auf Geschäftsreisen oder ähnlichem regelmäßig Nächte außerhalb Ihrer Wohnung? Ja Nein

11 If yes, how many nights per month do you spend on average outside your flat? Days / Month
 Wenn Ja, wie viele Nächte pro Monat verbringen Sie durchschnittlich ausserhalb Ihrer Wohnung? Tage / Monat

12 Roughly, how many days of holiday do you take per year? 50 Days
 Wie viele Urlaubstage nehmen Sie ungefähr pro Jahr? Tage

13 Out of these holidays, how many days and nights do you spend away from your home? 50 Days
 Von diesen Urlaubstagen, wie viele Tage und Nächte verbringen Sie nicht zu Hause (z.B. auf Reise im Hotel o.ä...)? Tage

14 Where is your house/flat? Postcode City Country
 Wo ist Ihre Wohnung / Ihr Haus? PLZ Ort Land

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- Bedrooms
Schlafzimmer
- Livingrooms
Wohnzimmer
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Küche oder Wohnküche
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Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate 50 Years
Jahre

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Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Months
Monate 40 Years
Jahre

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Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
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Überhaupt nicht wahrscheinlich unlikely
unwahrscheinlich don't know
ich weiß nicht likely
wahrscheinlich very likely
sehr wahrscheinlich

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Persönliche Informationen: Geschlecht
Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
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- a) Safe as pdf document and send to florian.wurfbaum@network.rca.ac.uk
Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) Print out and fax to: +49 (0)89.95 474 526
Drucken Sie den Fragebogen aus und faxen ihn an:

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

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		from	until
Monday Montag	0:00	0:00	<input type="checkbox"/>
	0:30	0:30	<input type="checkbox"/>
	1:00	1:00	<input type="checkbox"/>
	1:30	1:30	<input type="checkbox"/>
	2:00	2:00	<input type="checkbox"/>
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	22:30	22:30	<input type="checkbox"/>
	23:00	23:00	<input type="checkbox"/>
	23:30	23:30	<input type="checkbox"/>
	0:00		

6 Employment status employed self-employed unemployed student in training
 Erwerbsstatus angestellt selbständig ohne Anstellung Student/In in Ausbildung

retired other, please state

Rentner anderes, bitte angeben

7 Do you work full-time? part-time? without clearly defined timeframe?
 Arbeiten Sie Vollzeit Teilzeit ohne fixe Arbeitszeiten

8 Do you work at home, even if it's just occasionally? Yes No
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Schlafzimmer
- 1 Livingrooms
Wohnzimmer
- Kitchen or Kitchen-Diner
Küche oder Wohnküche
- Bathroom
Badezimmer
- WC (separate)
Extra WC
- Dining Room*

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Größe ihrer Wohnung / ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate 19 Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Months
Monate 20 Years
Jahre
bis zum Tod

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player
MP3 Spieler Tablet PC (iPad)
Tablett PC (z.B. iPad) Smartphone
Smartphone Kindle or other eReader
Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?
 Not likely at all
Überhaupt nicht wahrscheinlich unlikely
unwahrscheinlich don't know
ich weiß nicht likely
wahrscheinlich very likely
sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is
Ich weiß nicht was die Cloud ist Yes
Ja No
Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is
Ich weiß nicht was Facebook ist Yes
Ja No
Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? 3 Hours/Week
Stunden / Woche

25 Personal information: Gender? female
weiblich male
männlich
Persönliche Informationen: Geschlecht
Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
Alter

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

- a) Safe as pdf document and send to florian.wurfbaum@network.rca.ac.uk
Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) Print out and fax to: +49 (0)89.95 474 526
Drucken Sie den Fragebogen aus und faxen ihn an:

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Dwelling Utilisation Survey - Wohngebäude- Nutzungs- Umfrage

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue.
 Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 How many persons all together live in your household? 1 (Me) 2 3 4 5 if more: Persons
 Wie viele Personen insgesamt leben in Ihrem Haushalt? 1 (Ich) 2 3 4 5 falls mehr: Personen

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (mark the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (markieren Sie die jeweiligen Zeitabschnitte). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren.

Time Uhrzeit	from		until	
	0:00	0:30	0:30	1:00
	1:00	1:30	2:00	2:30
	2:30	3:00	3:00	3:30
	3:30	4:00	4:00	4:30
	4:30	5:00	5:00	5:30
	5:30	6:00	6:00	6:30
	6:30	7:00	7:00	7:30
	7:30	8:00	8:00	8:30
	8:30	9:00	9:00	9:30
	9:30	10:00	10:00	10:30
	10:30	11:00	11:00	11:30
	11:30	12:00	12:00	12:30
	12:30	13:00	13:00	13:30
	13:30	14:00	14:00	14:30
	14:30	15:00	15:00	15:30
	15:30	16:00	16:00	16:30
	16:30	17:00	17:00	17:30
	17:30	18:00	18:00	18:30
	18:30	19:00	19:00	19:30
	19:30	20:00	20:00	20:30
	20:30	21:00	21:00	21:30
	21:30	22:00	22:00	22:30
	22:30	23:00	23:00	23:30
	23:30	0:00		

Date (dd/mm) Datum (tt/mm)

3.2.14
4.2.14
5.2.14
6.2.14
7.2.14
8.2.14
9.2.14

3 Would you estimate the week you recorded above as a typical and representative week? Yes No
 Denken Sie, daß die oben aufgezeichnete Woche eine typische und repräsentative Woche ist? Ja Nein

If Yes: Please continue with question 4.
 Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness...
 Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. wg. Urlaub, Überstunden, Krankheit....)

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week
 b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

Day Tag	from		until	
	0:00	0:30	0:30	1:00
	1:00	1:30	2:00	2:30
	2:30	3:00	3:00	3:30
	3:30	4:00	4:00	4:30
	4:30	5:00	5:00	5:30
	5:30	6:00	6:00	6:30
	6:30	7:00	7:00	7:30
	7:30	8:00	8:00	8:30
	8:30	9:00	9:00	9:30
	9:30	10:00	10:00	10:30
	10:30	11:00	11:00	11:30
	11:30	12:00	12:00	12:30
	12:30	13:00	13:00	13:30
	13:30	14:00	14:00	14:30
	14:30	15:00	15:00	15:30
	15:30	16:00	16:00	16:30
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	17:30	18:00	18:00	18:30
	18:30	19:00	19:00	19:30
	19:30	20:00	20:00	20:30
	20:30	21:00	21:00	21:30
	21:30	22:00	22:00	22:30
	22:30	23:00	23:00	23:30
	23:30	0:00		

Monday Montag
 Tuesday Dienstag
 Wednesday Mittwoch
 Thursday Donnerstag
 Friday Freitag
 Saturday Samstag
 Sunday Sonntag

tick/untick boxes for times when you are at your house, leave boxes plain for times you spend out of house (in excel change colour).
 bitte kreuzen Sie die Zeiten an, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat ihre Wohnung / Ihr Haus?

- 2 Bedrooms
Schlafzimmer
- 1 Livingrooms
Wohnzimmer
- 1 Kitchen or Kitchen-Diner
Küche oder Wohnküche
- 1 Bathroom
Badezimmer
- 1 WC (separate)
Extra WC
- 1 **Arbeitszimmer**

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Größe ihrer Wohnung /Ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate 42 Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Months
Monate Years
Jahre **bis ich sterbe**

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player
MP3 Spieler Tablet PC (iPad)
Tablett PC (z.B. iPad) Smartphone
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Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?
 Not likely at all
Überhaupt nicht wahrscheinlich unlikely
unwahrscheinlich don't know
ich weiß nicht likely
wahrscheinlich very likely
sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is
Ich weiß nicht was die Cloud ist Yes
Ja No
Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is
Ich weiß nicht was Facebook ist Yes
Ja No
Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? 0 Hours/Week
Stunden / Woche

25 Personal information:
Persönliche Informationen: Gender?
Geschlecht female
weiblich male
männlich
Age?
Alter 20 - 30 30 - 40 40 - 50 50 - 60 > 60

Thank you very much for your effort. To return this form, please chose one of the following options:
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Drucken Sie den Fragebogen aus und faxen ihn an:

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No
 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein

If yes: Please continue with question 5. If no: Please go to question 6.
 Wenn ja: weiter mit Frage 5 Wenn Nein: weiter mit Frage 6

5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	mark boxes for times when you are at your house, leave boxes plain for times you spend out of house. bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.	
		from	until
Monday Montag	0:00	<input type="checkbox"/>	<input type="checkbox"/>
	0:30	<input type="checkbox"/>	<input type="checkbox"/>
	1:00	<input type="checkbox"/>	<input type="checkbox"/>
	1:30	<input type="checkbox"/>	<input type="checkbox"/>
	2:00	<input type="checkbox"/>	<input type="checkbox"/>
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	21:30	<input type="checkbox"/>	<input type="checkbox"/>
	22:00	<input type="checkbox"/>	<input type="checkbox"/>
	22:30	<input type="checkbox"/>	<input type="checkbox"/>
	23:00	<input type="checkbox"/>	<input type="checkbox"/>
	23:30	<input type="checkbox"/>	<input type="checkbox"/>
	0:00	<input type="checkbox"/>	<input type="checkbox"/>

6 Employment status employed self-employed unemployed student in training
 Erwerbsstatus angestellt selbständig ohne Anstellung Student/in in Ausbildung

retired other, please state
 Rentner anderes, bitte angeben

7 Do you work full-time? part-time? without clearly defined timeframe?
 Arbeiten Sie Vollzeit Teilzeit ohne fixe Arbeitszeiten

8 Do you work at home, even if it's just occasionally? Yes No
 Arbeiten Sie (wenn auch nur gelegentlich) von zu Hause? Ja Nein

9 If Yes, how many hours on these days on average? Mo Tu We Th Fr Sa Su
 Wenn Ja, wie viele Stunden an diesen Tagen durchschnittlich? Mo Di Mi Do Fr Sa So

10 Do you regularly stay overnight away from home for businessstrips or similar? Yes No
 Verbringen Sie auf Geschäftsreisen oder ähnlichem regelmäßig Nächte außerhalb Ihrer Wohnung? Ja Nein

11 If yes, how many nights per month do you spend on average outside your flat? 3 Days / Month
 Wenn Ja, wie viele Nächte pro Monat verbringen Sie durchschnittlich ausserhalb Ihrer Wohnung? Tage / Monat

12 Roughly, how many days of holiday do you take per year? Days
 Wie viele Urlaubstage nehmen Sie ungefähr pro Jahr? Tage

13 Out of these holidays, how many days and nights do you spend away from your home? Days
 Von diesen Urlaubstagen, wie viele Tage und Nächte verbringen Sie nicht zu Hause (z.B. auf Reise im Hotel o.ä...)? Tage

14 Where is your house/flat? Postcode City Country
 Wo ist Ihre Wohnung / Ihr Haus? PLZ Ort Land

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

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Schlafzimmer
- Livingrooms
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- Kitchen or Kitchen-Diner
Küche oder Wohnküche
- Bathroom
Badezimmer
- WC (separate)
Extra WC
- other rooms: (please state)
andere Zimmer (bitte nennen)

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17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? 10 Months
Monate Years
Jahre

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Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
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Überhaupt nicht wahrscheinlich unlikely
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Ich weiß nicht was Facebook ist Yes
Ja No
Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? Hours/Week
Stunden / Woche

25 Personal information: Gender? female male
Persönliche Informationen: Geschlecht weiblich männlich
Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
Alter

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Dwelling Utilisation Survey - Wohngebäude- Nutzungs- Umfrage

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue.
 Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 How many persons all together live in your household? 1 (Me) 2 3 4 5 if more: 6 Persons
 Wie viele Personen insgesamt leben in Ihrem Haushalt? 1 (Ich) 2 3 4 5 falls mehr: 6 Personen

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (mark the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (markieren Sie die jeweiligen Zeitabschnitte). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren.

Time Uhrzeit	from		untill																																																																																												
	0:00	0:30	0:30	1:00	1:00	1:30	1:30	2:00	2:00	2:30	2:30	3:00	3:00	3:30	3:30	4:00	4:00	4:30	4:30	5:00	5:00	5:30	5:30	6:00	6:00	6:30	6:30	7:00	7:00	7:30	7:30	8:00	8:00	8:30	8:30	9:00	9:00	9:30	9:30	10:00	10:00	10:30	10:30	11:00	11:00	11:30	11:30	12:00	12:00	12:30	12:30	13:00	13:00	13:30	13:30	14:00	14:00	14:30	14:30	15:00	15:00	15:30	15:30	16:00	16:00	16:30	16:30	17:00	17:00	17:30	17:30	18:00	18:00	18:30	18:30	19:00	19:00	19:30	19:30	20:00	20:00	20:30	20:30	21:00	21:00	21:30	21:30	22:00	22:00	22:30	22:30	23:00	23:00	23:30	23:30
Date (dd/mm) Datum (tt/mm)	28. 11. 13		[shaded]																																																																																												
	29. 11. 13		[shaded]																																																																																												
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3 Would you estimate the week you recorded above as a typical and representative week? Yes No
 Denken Sie, daß die oben aufgezeichnete Woche eine typische und repräsentative Woche ist? Ja Nein

If Yes: Please continue with question 4.
 Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness...
 Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. wg. Urlaub, Überstunden, Krankheit....)

[Empty box for answer to question 3b)

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week
 b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

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Monday Montag				[shaded]																																																																																											
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Wednesday Mittwoch				[shaded]																																																																																											
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 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein

If yes: Please continue with question 5.
 Wenn ja: weiter mit Frage 5

If no: Please go to question 6.
 Wenn Nein: weiter mit Frage 6

5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	mark boxes for times when you are at your house, leave boxes plain for times you spend out of house. bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.																																																
		from	until	0:00	0:30	1:00	1:30	2:00	2:30	3:00	3:30	4:00	4:30	5:00	5:30	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30	21:00	21:30	22:00	22:30	23:00
Monday Montag		[Grid with blue shading from 0:00 to 23:30]																																																
Tuesday Dienstag		[Grid with blue shading from 0:00 to 23:30]																																																
Wednesday Mittwoch		[Grid with blue shading from 0:00 to 23:30]																																																
Thursday Donnerstag		[Grid with blue shading from 0:00 to 23:30]																																																
Friday Freitag		[Grid with blue shading from 0:00 to 23:30]																																																
Saturday Samstag		[Grid with blue shading from 0:00 to 23:30]																																																
Sunday Sonntag		[Grid with blue shading from 0:00 to 23:30]																																																

6 Employment status employed self-employed unemployed student in training
 Erwerbsstatus angestellt selbständig ohne Anstellung Student/In in Ausbildung

retired other, please state

7 Do you work full-time? part-time? without clearly defined timeframe?
 Arbeiten Sie Vollzeit Teilzeit ohne fixe Arbeitszeiten

8 Do you work at home, even if it's just occasionally? Yes No
 Arbeiten Sie (wenn auch nur gelegentlich) von zu Hause? Ja Nein

9 If Yes, how many hours on these days on average? Mo 5 Tu 0 We 3 Th 3 Fr 4 Sa 9 Su 9
 Wenn Ja, wie viele Stunden an diesen Tagen durchschnittlich? Mo Di Mi Do Fr Sa So

10 Do you regularly stay overnight away from home for businessstrips or similar? Yes No
 Verbringen Sie auf Geschäftsreisen oder ähnlichem regelmäßig Nächte außerhalb Ihrer Wohnung? Ja Nein

11 If yes, how many nights per month do you spend on average outside your flat? 2-3 Days / Month
 Wenn Ja, wie viele Nächte pro Monat verbringen Sie durchschnittlich ausserhalb Ihrer Wohnung? Tage / Monat

12 Roughly, how many days of holiday do you take per year? 4 Months
 Wie viele Urlaubstage nehmen Sie ungefähr pro Jahr? Tage

13 Out of these holidays, how many days and nights do you spend away from your home? fast 1/2
 Von diesen Urlaubstagen, wie viele Tage und Nächte verbringen Sie nicht zu Hause (z.B. auf Reise im Hotel o.ä...)? Tage

14 Where is your house/flat? Postcode City München Country Deutschland
 Wo ist Ihre Wohnung / Ihr Haus? PLZ Ort Land

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / ~~das Haus~~?

- Bedrooms
Schlafzimmer
- Livingrooms
Wohnzimmer
- Kitchen or Kitchen-Diner
Küche oder Wohnküche
- Bathroom
Badezimmer
- WC (separate)
Extra WC
- ~~and other rooms~~ **6 Individualzimmer (Wohnheim)**

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Größe Ihrer Wohnung / ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? 6 Months
Monate Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player
MP3 Spieler Tablet PC (iPad)
Tablett PC (z.B. iPad) Smartphone
Smartphone Kindle or other eReader
Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?

Not likely at all unlikely don't know likely very likely
Überhaupt nicht wahrscheinlich unwahrscheinlich ich weiß nicht wahrscheinlich sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is
Ich weiß nicht was die Cloud ist Yes
Ja No
Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is
Ich weiß nicht was Facebook ist Yes
Ja No
Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? 0-1 Hours/Week
Stunden / Woche 2

25 Personal information:
Persönliche Informationen: Gender? female
weiblich male
männlich
Age? ¹⁹ 20 - 30 30 - 40 40 - 50 50 - 60 > 60

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

- a) Safe as pdf document and send to **florian.wurfbaum@network.rca.ac.uk**
Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) Print out **and fax to: +49 (0)89.95 474 526**
Drucken Sie den Fragebogen aus **und faxen ihn an:**

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

Dwelling Utilisation Survey - Wohngebäude- Nutzungs- Umfrage

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue.
 Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 How many persons all together live in your household? 1 (Me) 2 3 4 5 if more: Persons
 Wie viele Personen insgesamt leben in Ihrem Haushalt? 1 (Ich) 2 3 4 5 falls mehr: Personen

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (mark the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (markieren Sie die jeweiligen Zeitabschnitte). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren.

Time Uhrzeit	from		until		Date (dd/mm) Datum (tt/mm)
	from	until	from	until	
0:00	0:00	0:30			28.11.13
0:30	0:30	1:00			
1:00	1:00	1:30			29.11.13
1:30	1:30	2:00			
2:00	2:00	2:30			30.11.13
2:30	2:30	3:00			
3:00	3:00	3:30			1.12.13
3:30	3:30	4:00			
4:00	4:00	4:30			2.12.13
4:30	4:30	5:00			
5:00	5:00	5:30			3.12.13
5:30	5:30	6:00			
6:00	6:00	6:30			4.12.13
6:30	6:30	7:00			
7:00	7:00	7:30			
7:30	7:30	8:00			
8:00	8:00	8:30			
8:30	8:30	9:00			
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18:30	18:30	19:00			
19:00	19:00	19:30			
19:30	19:30	20:00			
20:00	20:00	20:30			
20:30	20:30	21:00			
21:00	21:00	21:30			
21:30	21:30	22:00			
22:00	22:00	22:30			
22:30	22:30	23:00			
23:00	23:00	23:30			
23:30	23:30	0:00			

3 Would you estimate the week you recorded above as a typical and representative week? Yes No
 Denken Sie, daß die oben aufgezeichnete Woche eine typische und repräsentative Woche ist? Ja Nein

If Yes: Please continue with question 4.
 Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness...
 Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. wg. Urlaub, Überstunden, Krankheit....)

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week
 b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

Day Tag	Time Uhrzeit	from		until	
		from	until	from	until
Monday Montag	0:00	0:00	0:30		
	0:30	0:30	1:00		
Tuesday Dienstag	1:00	1:00	1:30		
	1:30	1:30	2:00		
Wednesday Mittwoch	2:00	2:00	2:30		
	2:30	2:30	3:00		
Thursday Donnerstag	3:00	3:00	3:30		
	3:30	3:30	4:00		
Friday Freitag	4:00	4:00	4:30		
	4:30	4:30	5:00		
Saturday Samstag	5:00	5:00	5:30		
	5:30	5:30	6:00		
Sunday Sonntag	6:00	6:00	6:30		
	6:30	6:30	7:00		
	7:00	7:00	7:30		
	7:30	7:30	8:00		
	8:00	8:00	8:30		
	8:30	8:30	9:00		
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	9:30	9:30	10:00		
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	22:00	22:00	22:30		
	22:30	22:30	23:00		
	23:00	23:00	23:30		
	23:30	23:30	0:00		

tick/untick boxes for times when you are at your house, leave boxes plain for times you spend out of house (in excel change colour).
 bitte kreuzen Sie die Zeiten an, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.

siehe oben!

4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No
 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein

If yes: Please continue with question 5.
 Wenn ja: weiter mit Frage 5

If no: Please go to question 6.
 Wenn Nein: weiter mit Frage 6

5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	mark boxes for times when you are at your house, leave boxes plain for times you spend out of house. bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.	
		from	until
		0:00	0:30
		0:30	1:00
		1:00	1:30
		1:30	2:00
		2:00	2:30
		2:30	3:00
		3:00	3:30
		3:30	4:00
		4:00	4:30
		4:30	5:00
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		20:00	20:30
		20:30	21:00
		21:00	21:30
		21:30	22:00
		22:00	22:30
		22:30	23:00
		23:00	23:30
		23:30	0:00

6 Employment status employed self-employed unemployed student in training
 Erwerbsstatus angestellt selbständig ohne Anstellung Student/In in Ausbildung

retired other, please state

Rentner anderes, bitte angeben

7 Do you work full-time? part-time? without clearly defined timeframe?
 Arbeiten Sie Vollzeit Teilzeit ohne fixe Arbeitszeiten

8 Do you work at home, even if it's just occasionally? Yes No
 Arbeiten Sie (wenn auch nur gelegentlich) von zu Hause? Ja Nein

9 If Yes, how many hours on these days on average? Mo Tu We Th Fr Sa Su
 Wenn Ja, wie viele Stunden an diesen Tagen durchschnittlich? Mo Di Mi Do Fr Sa So

10 Do you regularly stay overnight away from home for businessstrips or similar? Yes No
 Verbringen Sie auf Geschäftsreisen oder ähnlichem regelmäßig Nächte außerhalb Ihrer Wohnung? Ja Nein

11 If yes, how many nights per month do you spend on average outside your flat? 4 Days / Month
 Wenn Ja, wie viele Nächte pro Monat verbringen Sie durchschnittlich ausserhalb Ihrer Wohnung? 4 Tage / Monat

12 Roughly, how many days of holiday do you take per year? 4 Monate
 Wie viele Urlaubstage nehmen Sie ungefähr pro Jahr? 4 Tage

13 Out of these holydays, how many days and nights do you spend away from your home? 3 Monate
 Von diesen Urlaubstagen, wie viele Tage und Nächte verbringen Sie nicht zu Hause (z.B. auf Reise im Hotel o.ä...)? 3 Tage

14 Where is your house/flat? Postcode 82196 City Griesseele Country Germany
 Wo ist Ihre Wohnung / Ihr Haus? PLZ Ort Land

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- 1 Bedrooms
Schlafzimmer
- 0 Livingrooms
Wohnzimmer
- 1 Kitchen or Kitchen-Diner
Küche oder Wohnküche
- 1 Bathroom
Badezimmer
- 0 WC (separate)
Extra WC

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Größe Ihrer Wohnung / Ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate 2 Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? 6 Months
Monate Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player MP3 Spieler Tablet PC (iPad) Tablett PC (z.B. iPad) Smartphone Smartphone Kindle or other eReader Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotographie-Sammlungen in der Zukunft ersetzen?
Not likely at all Überhaupt nicht wahrscheinlich unlikely unwahrscheinlich don't know ich weiß nicht likely wahrscheinlich very likely sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is Ich weiß nicht was die Cloud ist Yes Ja No Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is Ich weiß nicht was Facebook ist Yes Ja No Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? 4 Hours/Week
Stunden / Woche

25 Personal information: Gender? female weiblich male männlich
Persönliche Informationen: Geschlecht
Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
Alter

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

- a) Safe as pdf document and send to florian.wurfbaum@network.rca.ac.uk
Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) Print out and fax to: +49 (0)89.95 474 526
Drucken Sie den Fragebogen aus und faxen ihn an:

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

Dwelling Utilisation Survey - Wohngebäude- Nutzungs- Umfrage

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue.
 Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 How many persons all together live in your household? 1 (Me) 2 3 4 5 if more: Persons
 Wie viele Personen insgesamt leben in Ihrem Haushalt? 1 (Ich) 2 3 4 5 falls mehr: Personen

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (mark the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (markieren Sie die jeweiligen Zeitabschnitte). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren.

Time Uhrzeit	until		from	
	0:30	1:00	0:00	0:30
	1:30	2:00	1:00	1:30
	2:30	3:00	2:00	2:30
	3:30	4:00	3:00	3:30
	4:30	5:00	4:00	4:30
	5:30	6:00	5:00	5:30
	6:30	7:00	6:00	6:30
	7:30	8:00	7:00	7:30
	8:30	9:00	8:00	8:30
	9:30	10:00	9:00	9:30
	10:30	11:00	10:00	10:30
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	20:30	21:00	20:00	20:30
	21:30	22:00	21:00	21:30
	22:30	23:00	22:00	22:30
	23:30	0:00	23:00	23:30

Date (dd/mm) Datum (tt/mm)

25.11
26.11
27.11
28.11
29.11
30.11
1.12

3 Would you estimate the week you recorded above as a typical and representative week? Yes No
 Denken Sie, daß die oben aufgezeichnete Woche eine typische und repräsentative Woche ist? Ja Nein

If Yes: Please continue with question 4.
 Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness...
 Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. wg. Urlaub, Überstunden, Krankheit....)

27.11 illness, 1.12 travel

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week
 b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

Day Tag	until		from	
	0:30	1:00	0:00	0:30
	1:30	2:00	1:00	1:30
	2:30	3:00	2:00	2:30
	3:30	4:00	3:00	3:30
	4:30	5:00	4:00	4:30
	5:30	6:00	5:00	5:30
	6:30	7:00	6:00	6:30
	7:30	8:00	7:00	7:30
	8:30	9:00	8:00	8:30
	9:30	10:00	9:00	9:30
	10:30	11:00	10:00	10:30
	11:30	12:00	11:00	11:30
	12:30	13:00	12:00	12:30
	13:30	14:00	13:00	13:30
	14:30	15:00	14:00	14:30
	15:30	16:00	15:00	15:30
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	17:30	18:00	17:00	17:30
	18:30	19:00	18:00	18:30
	19:30	20:00	19:00	19:30
	20:30	21:00	20:00	20:30
	21:30	22:00	21:00	21:30
	22:30	23:00	22:00	22:30
	23:30	0:00	23:00	23:30

Monday Montag
 Tuesday Dienstag
 Wednesday Mittwoch
 Thursday Donnerstag
 Friday Freitag
 Saturday Samstag
 Sunday Sonntag

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- Bedrooms
Schlafzimmer
- Livingrooms
Wohnzimmer
- Kitchen or Kitchen-Diner
Küche oder Wohnküche
- Bathroom
Badezimmer
- WC (separate)
- Extra WC

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
 Größe Ihrer Wohnung / Ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Months
Monate 3 Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player
MP3 Spieler Tablet PC (iPad)
Tablett PC (z.B. iPad) Smartphone
Smartphone Kindle or other eReader
Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotographie-Sammlungen in der Zukunft ersetzen?
 Not likely at all
Überhaupt nicht wahrscheinlich unlikely
unwahrscheinlich don't know
ich weiß nicht likely
wahrscheinlich very likely
sehr wahrscheinlich
book
music, film, video, photographs

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is
Ich weiß nicht was die Cloud ist Yes
Ja No
Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is
Ich weiß nicht was Facebook ist Yes
Ja No
Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? 15 Hours/Week
Stunden / Woche

25 Personal information:
Persönliche Informationen: Gender?
Geschlecht: female
weiblich male
männlich
 Age?
Alter: 20 - 30 30 - 40 40 - 50 50 - 60 > 60

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

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Drucken Sie den Fragebogen aus und faxen ihn an:

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Dwelling Utilisation Survey - Wohngebäude- Nutzungs- Umfrage

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue .
 Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 How many persons all together live in your household? 1 (Me) 2 3 4 5 if more: Persons
 Wie viele Personen insgesamt leben in Ihrem Haushalt? 1 (Ich) 2 3 4 5 falls mehr: Personen

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (mark the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (markieren Sie die jeweiligen Zeitabschnitte). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren.

Time Uhrzeit	from		until	
	0:00	0:30	0:30	1:00
Date (dd/mm) Datum (tt/mm)	28.11	X	X	X
	29.11			
	30.11			X
	1.12			X
	2.12			X
	3.12			X
	4.12			X

3 Would you estimate the week you recorded above as a typical and representative week? Yes No
 Denken Sie, daß die oben aufgezeichnete Woche eine typische und repräsentative Woche ist? Ja Nein

If Yes: Please continue with question 4.
 Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness...
 Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. wg. Urlaub, Überstunden, Krankheit....)

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week
 b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

Day Tag	from		until	
	0:00	0:30	0:30	1:00
Monday Montag				
Tuesday Dienstag				
Wednesday Mittwoch				
Thursday Donnerstag				
Friday Freitag				
Saturday Samstag				
Sunday Sonntag				

4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No
 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein

If yes: Please continue with question 5.
 Wenn ja: weiter mit Frage 5

If no: Please go to question 6.
 Wenn Nein: weiter mit Frage 6

5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	mark boxes for times when you are at your house, leave boxes plain for times you spend out of house. bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.	
		from	until
		0:00	0:30
		0:30	1:00
		1:00	1:30
		1:30	2:00
		2:00	2:30
		2:30	3:00
		3:00	3:30
		3:30	4:00
		4:00	4:30
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		20:00	20:30
		20:30	21:00
		21:00	21:30
		21:30	22:00
		22:00	22:30
		22:30	23:00
		23:00	23:30
		23:30	0:00

6 Employment status employed self-employed unemployed student in training
 Erwerbsstatus angestellt selbständig ohne Anstellung Student/in In Ausbildung

retired other, please state

7 Do you work full-time? part-time? without clearly defined timeframe?
 Arbeiten Sie Vollzeit Teilzeit ohne fixe Arbeitszeiten

8 Do you work at home, even if it's just occasionally? Yes No
 Arbeiten Sie (wenn auch nur gelegentlich) von zu Hause? Ja Nein

9 If Yes, how many hours on these days on average? Mo Tu We Th Fr Sa Su
 Wenn Ja, wie viele Stunden an diesen Tagen durchschnittlich? Mo Di Mi Do Fr Sa So

10 Do you regularly stay overnight away from home for business trips or similar? Yes No
 Verbringen Sie auf Geschäftsreisen oder ähnlichem regelmäßig Nächte außerhalb Ihrer Wohnung? Ja Nein

11 If yes, how many nights per month do you spend on average outside your flat? Days / Month
 Wenn Ja, wie viele Nächte pro Monat verbringen Sie durchschnittlich ausserhalb Ihrer Wohnung? Tage / Monat

12 Roughly, how many days of holiday do you take per year? Days
 Wie viele Urlaubstage nehmen Sie ungefähr pro Jahr? Tage

13 Out of these holidays, how many days and nights do you spend away from your home? Days
 Von diesen Urlaubstagen, wie viele Tage und Nächte verbringen Sie nicht zu Hause (z.B. auf Reise im Hotel o.ä...)? Tage

14 Where is your house/flat? Postcode City Country
 Wo ist Ihre Wohnung / Ihr Haus? PLZ Ort Land

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- 3 Bedrooms
Schlafzimmer
- 2 Livingrooms
Wohnzimmer
- Kitchen or Kitchen-Diner
Küche oder Wohnküche
- Bathroom
Badezimmer
- WC (separate)
Extra WC

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
 Größe ihrer Wohnung / ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate 6 Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? 6 Months
Monate Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player
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 Not likely at all
Überhaupt nicht wahrscheinlich unlikely
unwahrscheinlich don't know
ich weiß nicht likely
wahrscheinlich very likely
sehr wahrscheinlich

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Speichern Sie Daten in der Cloud? I don't know what the cloud is
Ich weiß nicht was die Cloud ist Yes
Ja No
Nein

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Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is
Ich weiß nicht was Facebook ist Yes
Ja No
Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? 18 Hours/Week
Stunden / Woche

25 Personal information: Gender? female
weiblich male
männlich
 Persönliche Informationen: Geschlecht
 Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
 Alter

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- 4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No
 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein
- If yes: Please continue with question 5. If no: Please go to question 6.
 Wenn ja: weiter mit Frage 5 Wenn Nein: weiter mit Frage 6

- 5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	mark boxes for times when you are at your house, leave boxes plain for times you spend out of house. bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.	
		from	until
		0:00	0:30
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		21:00	21:30
		21:30	22:00
		22:00	22:30
		22:30	23:00
		23:00	23:30
		23:30	0:00

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- retired other, please state
- Rentner anderes, bitte angeben

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 Wenn Ja, wie viele Stunden an diesen Tagen durchschnittlich? Mo Di Mi Do Fr Sa So

- 10 Do you regularly stay overnight away from home for businessstrips or similar? Yes No
 Verbringen Sie auf Geschäftsreisen oder ähnlichem regelmäßig Nächte außerhalb Ihrer Wohnung? Ja Nein

- 11 If yes, how many nights per month do you spend on average outside your flat? Days / Month
 Wenn Ja, wie viele Nächte pro Monat verbringen Sie durchschnittlich ausserhalb Ihrer Wohnung? Tage / Monat

- 12 Roughly, how many days of holiday do you take per year? Days
 Wie viele Urlaubstage nehmen Sie ungefähr pro Jahr? Tage

- 13 Out of these holydays, how many days and nights do you spend away from your home? Days
 Von diesen Urlaubstagen, wie viele Tage und Nächte verbringen Sie nicht zu Hause (z.B. auf Reise im Hotel o.ä...)? Tage

- 14 Where is your house/flat? Postcode City Country
 Wo ist Ihre Wohnung / Ihr Haus? PLZ Ort Land

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

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Wohnzimmer
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Extra WC
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Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate 10 Years
Jahre

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Monate ? Years
Jahre

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Mieter/In

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unwahrscheinlich don't know
ich weiß nicht likely
wahrscheinlich very likely
sehr wahrscheinlich

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Ich weiß nicht was Facebook ist Yes
Ja No
Nein

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Wie viel Freizeit verbringen Sie im Internet? 5 Hours/Week
Stunden / Woche

25 Personal information: Gender? female
weiblich male
männlich
Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60

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 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein

If yes: Please continue with question 5.
 Wenn ja: weiter mit Frage 5

If no: Please go to question 6.
 Wenn Nein: weiter mit Frage 6

5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	mark boxes for times when you are at your house, leave boxes plain for times you spend out of house. bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.	
		from	until
Monday Montag	0:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	0:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	1:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	1:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	2:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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	3:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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	22:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	23:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	23:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	0:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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retired other, please state
Rentner anderes, bitte angeben

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 Arbeiten Sie Vollzeit Teilzeit ohne fixe Arbeitszeiten

8 Do you work at home, even if it's just occasionally? Yes No
 Arbeiten Sie (wenn auch nur gelegentlich) von zu Hause? Ja Nein

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- 2 Bedrooms
Schlafzimmer
- 1 Livingrooms
Wohnzimmer
- 1 Kitchen or Kitchen-Diner
Küche oder Wohnküche
- 1 Bathroom
Badezimmer
- 1 WC (separate)
Extra WC
-

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Größe ihrer Wohnung / ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? 11 Months
Monate 20 Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? 10 Months
Monate 0 Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player Tablet PC (iPad) Smartphone Kindle or other eReader
MP3 Spieler Tablett PC (z.B. iPad) Smartphone Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?
Not likely at all unlikely don't know likely very likely
Überhaupt nicht wahrscheinlich unwahrscheinlich ich weiß nicht wahrscheinlich sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is Yes No
Ich weiß nicht was die Cloud ist Ja Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is Yes No
Ich weiß nicht was Facebook ist Ja Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? 18 Hours/Week
Stunden / Woche

25 Personal information: Gender? female male
Persönliche Informationen: Geschlecht weiblich männlich
Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
Alter

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

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Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) Print out and fax to: +49 (0)89.95 474 526
Drucken Sie den Fragebogen aus und faxen ihn an:

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

Dwelling Utilisation Survey - Wohngebäude- Nutzungs- Umfrage

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue.
 Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 How many persons all together live in your household? 1 (Me) 2 3 4 5 if more: Persons
 Wie viele Personen insgesamt leben in Ihrem Haushalt? 1 (Ich) 2 3 4 5 falls mehr: Personen

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (mark the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (markieren Sie die jeweiligen Zeitabschnitte). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren.

Time Uhrzeit	from		until		Date (dd/mm) Datum (tt/mm)
	0:00	0:30	0:30	1:00	
	0:00	0:30	0:30	1:00	10.27.11
	1:00	1:30	1:30	2:00	28.11
	2:00	2:30	2:30	3:00	29.11
	3:00	3:30	3:30	4:00	30.11
	4:00	4:30	4:30	5:00	01.12
	5:00	5:30	5:30	6:00	02.12
	6:00	6:30	6:30	7:00	03.12
	7:00	7:30	7:30	8:00	
	8:00	8:30	8:30	9:00	
	9:00	9:30	9:30	10:00	
	10:00	10:30	10:30	11:00	
	11:00	11:30	11:30	12:00	
	12:00	12:30	12:30	13:00	
	13:00	13:30	13:30	14:00	
	14:00	14:30	14:30	15:00	
	15:00	15:30	15:30	16:00	
	16:00	16:30	16:30	17:00	
	17:00	17:30	17:30	18:00	
	18:00	18:30	18:30	19:00	
	19:00	19:30	19:30	20:00	
	20:00	20:30	20:30	21:00	
	21:00	21:30	21:30	22:00	
	22:00	22:30	22:30	23:00	
	23:00	23:30	23:30	0:00	

3 Would you estimate the week you recorded above as a typical and representative week? Yes No
 Denken Sie, daß die oben aufgezeichnete Woche eine typische und repräsentative Woche ist? Ja Nein

If Yes: Please continue with question 4.
 Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness...
 Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. wg. Urlaub, Überstunden, Krankheit....)

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week
 b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

Day Tag	from		until	
	0:00	0:30	0:30	1:00
Monday Montag	0:00	0:30	0:30	1:00
Tuesday Dienstag	1:00	1:30	1:30	2:00
Wednesday Mittwoch	2:00	2:30	2:30	3:00
Thursday Donnerstag	3:00	3:30	3:30	4:00
Friday Freitag	4:00	4:30	4:30	5:00
Saturday Samstag	5:00	5:30	5:30	6:00
Sunday Sonntag	6:00	6:30	6:30	7:00
	7:00	7:30	7:30	8:00
	8:00	8:30	8:30	9:00
	9:00	9:30	9:30	10:00
	10:00	10:30	10:30	11:00
	11:00	11:30	11:30	12:00
	12:00	12:30	12:30	13:00
	13:00	13:30	13:30	14:00
	14:00	14:30	14:30	15:00
	15:00	15:30	15:30	16:00
	16:00	16:30	16:30	17:00
	17:00	17:30	17:30	18:00
	18:00	18:30	18:30	19:00
	19:00	19:30	19:30	20:00
	20:00	20:30	20:30	21:00
	21:00	21:30	21:30	22:00
	22:00	22:30	22:30	23:00
	23:00	23:30	23:30	0:00

tick/untick boxes for times when you are at your house, leave boxes plain for times you spend out of house (in excel change colour).
 bitte kreuzen Sie die Zeiten an, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- Bedrooms
Schlafzimmer
- Livingrooms
Wohnzimmer
- Kitchen or Kitchen-Diner
Küche oder Wohnküche
- Bathroom
Badezimmer
- WC (separate)
Extra WC

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Größe ihrer Wohnung /ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Months
Monate Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player
MP3 Spieler Tablet PC (iPad)
Tablett PC (z.B. iPad) Smartphone
Smartphone Kindle or other eReader
Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?

Not likely at all
Überhaupt nicht wahrscheinlich unlikely
unwahrscheinlich don't know
ich weiß nicht likely
wahrscheinlich very likely
sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is
Ich weiß nicht was die Cloud ist Yes
Ja No
Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is
Ich weiß nicht was Facebook ist Yes
Ja No
Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? Hours/Week
Stunden / Woche

25 Personal information:
Persönliche Informationen: Gender?
Geschlecht female
weiblich male
männlich Age?
Alter 20 - 30 30 - 40 40 - 50 50 - 60 > 60

Thank you very much for your effort. To return this form, please chose one of the following options:
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- b) Print out and fax to: +49 (0)89.95 474 526
Drucken Sie den Fragebogen aus und faxen ihn an:

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

- 4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No
 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein

If yes: Please continue with question 5.
 Wenn ja: weiter mit Frage 5

If no: Please go to question 6.
 Wenn Nein: weiter mit Frage 6

- 5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	mark boxes for times when you are at your house, leave boxes plain for times you spend out of house. bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.	
		from	until
		0:00	0:30
		0:30	1:00
		1:00	1:30
		1:30	2:00
		2:00	2:30
		2:30	3:00
		3:00	3:30
		3:30	4:00
		4:00	4:30
		4:30	5:00
		5:00	5:30
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		19:30	20:00
		20:00	20:30
		20:30	21:00
		21:00	21:30
		21:30	22:00
		22:00	22:30
		22:30	23:00
		23:00	23:30
		23:30	0:00

- 6 Employment status employed self-employed unemployed student in training
 Erwerbsstatus angestellt selbständig ohne Anstellung Student/in in Ausbildung
- retired other, please state
- Rentner anderes, bitte angeben

- 7 Do you work full-time? part-time? without clearly defined timeframe?
 Arbeiten Sie Vollzeit Teilzeit ohne fixe Arbeitszeiten

- 8 Do you work at home, even if it's just occasionally? Yes No
 Arbeiten Sie (wenn auch nur gelegentlich) von zu Hause? Ja Nein

- 9 If Yes, how many hours on these days on average? Mo Tu We Th Fr Sa Su
 Wenn Ja, wie viele Stunden an diesen Tagen durchschnittlich? Mo Di Mi Do Fr Sa So

- 10 Do you regularly stay overnight away from home for business trips or similar? Yes No
 Verbringen Sie auf Geschäftsreisen oder ähnlichem regelmäßig Nächte außerhalb Ihrer Wohnung? Ja Nein

- 11 If yes, how many nights per month do you spend on average outside your flat? Days / Month
 Wenn Ja, wie viele Nächte pro Monat verbringen Sie durchschnittlich ausserhalb Ihrer Wohnung? Tage / Monat

- 12 Roughly, how many days of holiday do you take per year? Days
 Wie viele Urlaubstage nehmen Sie ungefähr pro Jahr? Tage

- 13 Out of these holidays, how many days and nights do you spend away from your home? Days
 Von diesen Urlaubstagen, wie viele Tage und Nächte verbringen Sie nicht zu Hause (z.B. auf Reise im Hotel o.ä...)? Tage

- 14 Where is your house/flat? Postcode City Country
 Wo ist Ihre Wohnung / Ihr Haus? PLZ Ort Land

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- 2 Bedrooms
Schlafzimmer
- Livingrooms
Wohnzimmer
- 1 Kitchen or Kitchen-Diner
Küche oder Wohnküche
- 1 Bathroom
Badezimmer
- WC (separate)
Extra WC
- 1 Kammer

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
 Größe ihrer Wohnung /Ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate 2 Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Months
Monate Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player
MP3 Spieler Tablet PC (iPad)
Tablett PC (z.B. iPad) Smartphone
Smartphone Kindle or other eReader
Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?

Not likely at all
Überhaupt nicht wahrscheinlich unlikely
unwahrscheinlich don't know
ich weiß nicht likely
wahrscheinlich very likely
sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is
Ich weiß nicht was die Cloud ist Yes
Ja No
Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is
Ich weiß nicht was Facebook ist Yes
Ja No
Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? 6 Hours/Week
Stunden / Woche

25 Personal information: Gender? female male
Persönliche Informationen: Geschlecht weiblich männlich
Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
Alter

Thank you very much for your effort. To return this form, please chose one of the following options:
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Dwelling Utilisation Survey - Wohngebäude- Nutzungs- Umfrage

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue.
 Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 How many persons all together live in your household? 1 (Me) 2 3 4 5 if more: Persons
 Wie viele Personen insgesamt leben in Ihrem Haushalt? 1 (Ich) 2 3 4 5 falls mehr: Personen

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (mark the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (markieren Sie die jeweiligen Zeitabschnitte). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren.

Time Uhrzeit	until		from	
	0:30	1:00	0:00	0:30
	1:00	1:30	1:30	2:00
	2:00	2:30	2:30	3:00
	3:00	3:30	3:30	4:00
	4:00	4:30	4:30	5:00
	5:00	5:30	5:30	6:00
	6:00	6:30	6:30	7:00
	7:00	7:30	7:30	8:00
	8:00	8:30	8:30	9:00
	9:00	9:30	9:30	10:00
	10:00	10:30	10:30	11:00
	11:00	11:30	11:30	12:00
	12:00	12:30	12:30	13:00
	13:00	13:30	13:30	14:00
	14:00	14:30	14:30	15:00
	15:00	15:30	15:30	16:00
	16:00	16:30	16:30	17:00
	17:00	17:30	17:30	18:00
	18:00	18:30	18:30	19:00
	19:00	19:30	19:30	20:00
	20:00	20:30	20:30	21:00
	21:00	21:30	21:30	22:00
	22:00	22:30	22:30	23:00
	23:00	23:30	23:30	0:00

Date (dd/mm) Datum (tt/mm)	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	[grid]	[grid]	[grid]	[grid]	[grid]	[grid]	[grid]

3 Would you estimate the week you recorded above as a typical and representative week? Yes No
 Denken Sie, daß die oben aufgezeichnete Woche eine typische und repräsentative Woche ist? Ja Nein

If Yes: Please continue with question 4.
 Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness...
 Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. wg. Urlaub, Überstunden, Krankheit....)

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week
 b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

Day Tag	until		from	
	0:30	1:00	0:00	0:30
	1:00	1:30	1:30	2:00
	2:00	2:30	2:30	3:00
	3:00	3:30	3:30	4:00
	4:00	4:30	4:30	5:00
	5:00	5:30	5:30	6:00
	6:00	6:30	6:30	7:00
	7:00	7:30	7:30	8:00
	8:00	8:30	8:30	9:00
	9:00	9:30	9:30	10:00
	10:00	10:30	10:30	11:00
	11:00	11:30	11:30	12:00
	12:00	12:30	12:30	13:00
	13:00	13:30	13:30	14:00
	14:00	14:30	14:30	15:00
	15:00	15:30	15:30	16:00
	16:00	16:30	16:30	17:00
	17:00	17:30	17:30	18:00
	18:00	18:30	18:30	19:00
	19:00	19:30	19:30	20:00
	20:00	20:30	20:30	21:00
	21:00	21:30	21:30	22:00
	22:00	22:30	22:30	23:00
	23:00	23:30	23:30	0:00

Day Tag	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	[grid]	[grid]	[grid]	[grid]	[grid]	[grid]	[grid]

tick/untick boxes for times when you are at your house, leave boxes plain for times you spend out of house (in excel change colour),
 bitte kreuzen Sie die Zeiten an, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- 2 Bedrooms
Schlafzimmer
- 0 Livingrooms
Wohnzimmer
- 1 Kitchen or Kitchen-Diner
Küche oder Wohnküche
- 1 Bathroom
Badezimmer
- 1 WC (separate)
Extra WC

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Größe ihrer Wohnung / ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Months
Monate Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
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Not likely at all unlikely don't know likely very likely
Überhaupt nicht wahrscheinlich unwahrscheinlich ich weiß nicht wahrscheinlich sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is Yes No
Ich weiß nicht was die Cloud ist Ja Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is Yes No
Ich weiß nicht was Facebook ist Ja Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? 10 Hours/Week
Stunden / Woche

25 Personal information: Gender? female male
Persönliche Informationen: Geschlecht weiblich männlich
Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
Alter

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

- a) Safe as pdf document and send to florian.wurfbaum@network.rca.ac.uk
Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) Print out and fax to: +49 (0)89.95 474 526
Drucken Sie den Fragebogen aus und faxen ihn an:

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

Dwelling Utilisation Survey - Wohngebäude- Nutzungs- Umfrage

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue.
 Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 How many persons all together live in your household? 1 (Me) 2 3 4 5 if more: Persons
 Wie viele Personen insgesamt leben in Ihrem Haushalt? 1 (Ich) 2 3 4 5 falls mehr: Personen

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (mark the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (markieren Sie die jeweiligen Zeitabschnitte). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren.

Time Uhrzeit	until		from	
	0:30	1:00	0:00	0:30
	1:00	1:30	1:00	1:30
	2:00	2:30	2:00	2:30
	3:00	3:30	3:00	3:30
	4:00	4:30	4:00	4:30
	5:00	5:30	5:00	5:30
	6:00	6:30	6:00	6:30
	7:00	7:30	7:00	7:30
	8:00	8:30	8:00	8:30
	9:00	9:30	9:00	9:30
	10:00	10:30	10:00	10:30
	11:00	11:30	11:00	11:30
	12:00	12:30	12:00	12:30
	13:00	13:30	13:00	13:30
	14:00	14:30	14:00	14:30
	15:00	15:30	15:00	15:30
	16:00	16:30	16:00	16:30
	17:00	17:30	17:00	17:30
	18:00	18:30	18:00	18:30
	19:00	19:30	19:00	19:30
	20:00	20:30	20:00	20:30
	21:00	21:30	21:00	21:30
	22:00	22:30	22:00	22:30
	23:00	23:30	23:00	23:30
	0:00			

3 Would you estimate the week you recorded above as a typical and representative week? Yes No
 Denken Sie, daß die oben aufgezeichnete Woche eine typische und repräsentative Woche ist? Ja Nein

If Yes: Please continue with question 4.
 Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness...
 Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. wg. Urlaub, Überstunden, Krankheit...)

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week
 b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

Day Tag	Time Uhrzeit		from		until	
	0:00	0:30	0:00	0:30	0:30	1:00
Monday Montag	1:00	1:30	1:00	1:30	1:30	2:00
Tuesday Dienstag	2:00	2:30	2:00	2:30	2:30	3:00
Wednesday Mittwoch	3:00	3:30	3:00	3:30	3:30	4:00
Thursday Donnerstag	4:00	4:30	4:00	4:30	4:30	5:00
Friday Freitag	5:00	5:30	5:00	5:30	5:30	6:00
Saturday Samstag	6:00	6:30	6:00	6:30	6:30	7:00
Sunday Sonntag	7:00	7:30	7:00	7:30	7:30	8:00
	8:00	8:30	8:00	8:30	8:30	9:00
	9:00	9:30	9:00	9:30	9:30	10:00
	10:00	10:30	10:00	10:30	10:30	11:00
	11:00	11:30	11:00	11:30	11:30	12:00
	12:00	12:30	12:00	12:30	12:30	13:00
	13:00	13:30	13:00	13:30	13:30	14:00
	14:00	14:30	14:00	14:30	14:30	15:00
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	20:00	20:30	20:00	20:30	20:30	21:00
	21:00	21:30	21:00	21:30	21:30	22:00
	22:00	22:30	22:00	22:30	22:30	23:00
	23:00	23:30	23:00	23:30	23:30	0:00

tick/untick boxes for times when you are at your house, leave boxes plain for times you spend out of house (in excel change colour).
 bitte kreuzen Sie die Zeiten an, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.

4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No
 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein

If yes: Please continue with question 5.
 Wenn ja: weiter mit Frage 5

If no: Please go to question 6.
 Wenn Nein: weiter mit Frage 6

5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	mark boxes for times when you are at your house, leave boxes plain for times you spend out of house. bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.	
		from	until
		0:00	0:30
		0:30	1:00
		1:00	1:30
		1:30	2:00
		2:00	2:30
		2:30	3:00
		3:00	3:30
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		20:30	21:00
		21:00	21:30
		21:30	22:00
		22:00	22:30
		22:30	23:00
		23:00	23:30
		23:30	0:00

6 Employment status employed self-employed unemployed student in training
 Erwerbsstatus angestellt selbständig ohne Anstellung Student/In in Ausbildung

retired other, please state _____
 Rentner anderes, bitte angeben

7 Do you work full-time? part-time? without clearly defined timeframe?
 Arbeiten Sie Vollzeit Teilzeit ohne fixe Arbeitszeiten

8 Do you work at home, even if it's just occasionally? Yes No
 Arbeiten Sie (wenn auch nur gelegentlich) von zu Hause? Ja Nein

9 If Yes, how many hours on these days on average? Mo Tu We Th Fr Sa Su
 Wenn Ja, wie viele Stunden an diesen Tagen durchschnittlich? Mo Di Mi Do Fr Sa So

10 Do you regularly stay overnight away from home for business trips or similar? Yes No
 Verbringen Sie auf Geschäftsreisen oder ähnlichem regelmäßig Nächte außerhalb Ihrer Wohnung? Ja Nein

11 If yes, how many nights per month do you spend on average outside your flat? 3 Days / Month
 Wenn Ja, wie viele Nächte pro Monat verbringen Sie durchschnittlich ausserhalb Ihrer Wohnung? Tage / Monat

12 Roughly, how many days of holiday do you take per year? 120 Days
 Wie viele Urlaubstage nehmen Sie ungefähr pro Jahr? Tage

13 Out of these holidays, how many days and nights do you spend away from your home? 20 Days
 Von diesen Urlaubstagen, wie viele Tage und Nächte verbringen Sie nicht zu Hause (z.B. auf Reise im Hotel o.ä...)? Tage

14 Where is your house/flat? Postcode 80469 City MÜNCHEN Country GERMANY
 Wo ist Ihre Wohnung / Ihr Haus? PLZ Ort Land

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- 1 Bedrooms
Schlafzimmer
- 1 Livingrooms
Wohnzimmer
- 1 Kitchen or Kitchen-Diner
Küche oder Wohnküche
- 1 Bathroom
Badezimmer
- WC (separate)
Extra WC
- 1 OFFICE / ...

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²

Größe ihrer Wohnung /Ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus?

Months
Monate

3 Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen?

Months
Monate

3 Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie?

own
Eigentümer/In

rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte?

MP3 Player
MP3 Spieler

Tablet PC (iPad)
Tablett PC (z.B. iPad)

Smartphone
Smartphone

Kindle or other eReader
Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?

Not likely at all unlikely don't know likely very likely
Überhaupt nicht wahrscheinlich unwahrscheinlich ich weiß nicht wahrscheinlich sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud?

I don't know what the cloud is Yes No
Ich weiß nicht was die Cloud ist Ja Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk?

I don't know what Facebook is Yes No
Ich weiß nicht was Facebook ist Ja Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet?

10+ Hours/Week
Stunden / Woche

25 Personal information:
Persönliche Informationen:

Gender? female weiblich male männlich
Geschlecht M

Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
Alter

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

- a) Safe as pdf document and send to florian.wurfbaum@network.rca.ac.uk
Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) Print out and fax to: +49 (0)89.95 474 526
Drucken Sie den Fragebogen aus und faxen ihn an:

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

Dwelling Utilisation Survey - Wohngebäude- Nutzungs- Umfrage

Thank you very much for taking the time to answer this questionnaire. Please fill out fields highlighted blue.
 Vielen Dank, daß Sie sich die Zeit nehmen, an dieser Umfrage teilzunehmen. Bitte füllen Sie die blauen Felder aus.

1 How many persons all together live in your household? 1 (Me) 2 3 4 5 if more: Persons
 Wie viele Personen insgesamt leben in Ihrem Haushalt? 1 (Ich) 2 3 4 5 falls mehr: Personen

2 Please provide a record of the hours you spend at your household/home in seven consecutive days (mark the fields when you are at home, leave others empty). You can start with any day of the week, please just make sure you record seven consecutive days.

Bitte erstellen Sie für sieben aufeinander folgende Tage eine Aufzeichnung der Zeit, die Sie zu Hause verbringen (markieren Sie die jeweiligen Zeitabschnitte). Sie können mit einem beliebigen Tag beginnen, es ist aber wichtig, daß Sie einen zusammenhängenden Zeitraum dokumentieren.

Time Uhrzeit	until		from	
	0:30	1:00	0:00	0:30
	1:00	1:30	1:00	1:30
	2:00	2:30	2:00	2:30
	3:00	3:30	3:00	3:30
	4:00	4:30	4:00	4:30
	5:00	5:30	5:00	5:30
	6:00	6:30	6:00	6:30
	7:00	7:30	7:00	7:30
	8:00	8:30	8:00	8:30
	9:00	9:30	9:00	9:30
	10:00	10:30	10:00	10:30
	11:00	11:30	11:00	11:30
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	19:00	19:30	19:00	19:30
	20:00	20:30	20:00	20:30
	21:00	21:30	21:00	21:30
	22:00	22:30	22:00	22:30
	23:00	23:30	23:00	23:30
	0:00			

Date (dd/mm) Datum (tt/mm)

3 Would you estimate the week you recorded above as a typical and representative week? Yes No
 Denken Sie, daß die oben aufgezeichnete Woche eine typische und repräsentative Woche ist? Ja Nein

If Yes: Please continue with question 4.
 Wenn ja: weiter mit Frage 4

If No: a) Please state why the week above was not typical, e.g. holiday, extratime at work, illness...
 Wenn Nein a) Bitte geben Sie an, warum die aufgezeichnete Woche untypisch ist (z.B. wg. Urlaub, Überstunden, Krankheit....)

b) Please provide out of your memory another schedule of your times spent at home which describes a typical and representative week
 b) Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung Ihrer zu Hause verbrachten Zeit in einer typischen und repräsentativen Woche.

Day Tag	until		from	
	0:30	1:00	0:00	0:30
	1:00	1:30	1:00	1:30
	2:00	2:30	2:00	2:30
	3:00	3:30	3:00	3:30
	4:00	4:30	4:00	4:30
	5:00	5:30	5:00	5:30
	6:00	6:30	6:00	6:30
	7:00	7:30	7:00	7:30
	8:00	8:30	8:00	8:30
	9:00	9:30	9:00	9:30
	10:00	10:30	10:00	10:30
	11:00	11:30	11:00	11:30
	12:00	12:30	12:00	12:30
	13:00	13:30	13:00	13:30
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	15:00	15:30	15:00	15:30
	16:00	16:30	16:00	16:30
	17:00	17:30	17:00	17:30
	18:00	18:30	18:00	18:30
	19:00	19:30	19:00	19:30
	20:00	20:30	20:00	20:30
	21:00	21:30	21:00	21:30
	22:00	22:30	22:00	22:30
	23:00	23:30	23:00	23:30
	0:00			

Monday Montag
 Tuesday Dienstag
 Wednesday Mittwoch
 Thursday Donnerstag
 Friday Freitag
 Saturday Samstag
 Sunday Sonntag

tick/untick boxes for times when you are at your house, leave boxes plain for times you spend out of house (in excel change colour).
 bitte kreuzen Sie die Zeiten an, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.

4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No
 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein

If yes: Please continue with question 5.
 Wenn ja: weiter mit Frage 5

If no: Please go to question 6.
 Wenn Nein: weiter mit Frage 6

5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	from		until																																																																																												
		0:00	0:30	0:30	1:00	1:00	1:30	1:30	2:00	2:00	2:30	2:30	3:00	3:00	3:30	3:30	4:00	4:00	4:30	4:30	5:00	5:00	5:30	5:30	6:00	6:00	6:30	6:30	7:00	7:00	7:30	7:30	8:00	8:00	8:30	8:30	9:00	9:00	9:30	9:30	10:00	10:00	10:30	10:30	11:00	11:00	11:30	11:30	12:00	12:00	12:30	12:30	13:00	13:00	13:30	13:30	14:00	14:00	14:30	14:30	15:00	15:00	15:30	15:30	16:00	16:00	16:30	16:30	17:00	17:00	17:30	17:30	18:00	18:00	18:30	18:30	19:00	19:00	19:30	19:30	20:00	20:00	20:30	20:30	21:00	21:00	21:30	21:30	22:00	22:00	22:30	22:30	23:00	23:00	23:30	23:30
Monday Montag		[Grid of boxes for time slots]																																																																																														
Tuesday Dienstag		[Grid of boxes for time slots]																																																																																														
Wednesday Mittwoch		[Grid of boxes for time slots]																																																																																														
Thursday Donnerstag		[Grid of boxes for time slots]																																																																																														
Friday Freitag		[Grid of boxes for time slots]																																																																																														
Saturday Samstag		[Grid of boxes for time slots]																																																																																														
Sunday Sonntag		[Grid of boxes for time slots]																																																																																														

mark boxes for times when you are at your house, leave boxes plain for times you spend out of house.
 bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.

6 Employment status employed self-employed unemployed student in training
 Erwerbsstatus angestellt selbständig ohne Anstellung Student/In in Ausbildung
retired other, please state
Rentner anderes, bitte angeben

7 Do you work full-time? part-time? without clearly defined timeframe?
 Arbeiten Sie Vollzeit Teilzeit ohne fixe Arbeitszeiten

8 Do you work at home, even if it's just occasionally? Yes No
 Arbeiten Sie (wenn auch nur gelegentlich) von zu Hause? Ja Nein

9 If Yes, how many hours on these days on average? Mo Tu We Th Fr Sa Su
 Wenn Ja, wie viele Stunden an diesen Tagen durchschnittlich? Mo Di Mi Do Fr Sa So

10 Do you regularly stay overnight away from home for businessstrips or similar? Yes No
 Verbringen Sie auf Geschäftsreisen oder ähnlichem regelmäßig Nächte außerhalb Ihrer Wohnung? Ja Nein

11 If yes, how many nights per month do you spend on average outside your flat? Days / Month
 Wenn Ja, wie viele Nächte pro Monat verbringen Sie durchschnittlich ausserhalb Ihrer Wohnung? Tage / Monat

12 Roughly, how many days of holiday do you take per year? Days
 Wie viele Urlaubstage nehmen Sie ungefähr pro Jahr? Tage

13 Out of these holydays, how many days and nights do you spend away from your home? Days
 Von diesen Urlaubstagen, wie viele Tage und Nächte verbringen Sie nicht zu Hause (z.B. auf Reise im Hotel o.ä...)? Tage

14 Where is your house/flat? Postcode City Country
 Wo ist Ihre Wohnung / Ihr Haus? PLZ Ort Land

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

<input type="checkbox"/>	Bedrooms Schlafzimmer
<input type="checkbox"/>	Livingrooms Wohnzimmer
<input type="checkbox"/>	Kitchen or Kitchen-Diner Küche oder Wohnküche
<input type="checkbox"/>	Bathroom Badezimmer
<input type="checkbox"/>	WC (separate) Extra WC
<input type="checkbox"/>	other rooms: (please state) andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Größe Ihrer Wohnung / Ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus?

<input type="checkbox"/>	Months Monate	<input type="checkbox"/>	Years Jahre
--------------------------	------------------	--------------------------	----------------

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen?

<input type="checkbox"/>	Months Monate	<input type="checkbox"/>	Years Jahre
--------------------------	------------------	--------------------------	----------------

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie?

<input type="checkbox"/>	own Eigentümer/In	<input type="checkbox"/>	rent Mieter/In
--------------------------	----------------------	--------------------------	-------------------

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte?

<input type="checkbox"/>	MP3 Player MP3 Spieler	<input type="checkbox"/>	Tablet PC (iPad) Tablett PC (z.B. iPad)	<input type="checkbox"/>	Smartphone Smartphone	<input type="checkbox"/>	Kindle or other eReader Kindle oder anderes E-Lesegerät
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21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?

<input type="checkbox"/>	Not likely at all Überhaupt nicht wahrscheinlich	<input type="checkbox"/>	unlikely unwahrscheinlich	<input type="checkbox"/>	don't know ich weiß nicht	<input type="checkbox"/>	likely wahrscheinlich	<input type="checkbox"/>	very likely sehr wahrscheinlich
--------------------------	---	--------------------------	------------------------------	--------------------------	------------------------------	--------------------------	--------------------------	--------------------------	------------------------------------

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud?

<input type="checkbox"/>	I don't know what the cloud is Ich weiß nicht was die Cloud ist	<input type="checkbox"/>	Yes Ja	<input type="checkbox"/>	No Nein
--------------------------	--	--------------------------	-----------	--------------------------	------------

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk?

<input type="checkbox"/>	I don't know what Facebook is Ich weiß nicht was Facebook ist	<input type="checkbox"/>	Yes Ja	<input type="checkbox"/>	No Nein
--------------------------	--	--------------------------	-----------	--------------------------	------------

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet?

<input type="checkbox"/>	Hours/Week Stunden / Woche
--------------------------	-------------------------------

25 Personal information:
Persönliche Informationen:

Gender? Geschlecht	<input type="checkbox"/>	female weiblich	<input type="checkbox"/>	male männlich							
Age? Alter	<input type="checkbox"/>	20 - 30	<input type="checkbox"/>	30 - 40	<input type="checkbox"/>	40 - 50	<input type="checkbox"/>	50 - 60	<input type="checkbox"/>	<input type="checkbox"/>	> 60

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

- a) Safe as pdf document and send to
Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an florian.wurfbaum@network.rca.ac.uk
- b) Print out
Drucken Sie den Fragebogen aus and fax to: +49 (0)89.95 474 526
und faxen ihn an:

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

4 Do you have regular visitors, like partners or family, that frequently stay at your home? Yes No
 Haben Sie regelmäßig Besuch (z.B. Partner, Familie...), der regelmäßig bei Ihnen zu Hause ist und/oder übernachtet? Ja Nein

If yes: Please continue with question 5.
 Wenn ja: weiter mit Frage 5

If no: Please go to question 6.
 Wenn Nein: weiter mit Frage 6

5 Please provide out of your memory a typical schedule of the time your visitor spends at your flat/house
 Bitte erstellen Sie aus Ihrem Gedächtnis eine Aufzeichnung der Zeit, die Ihr Gast in einer typischen Woche bei Ihnen zu Hause verbringt.

Day Tag	Time Uhrzeit	mark boxes for times when you are at your house, leave boxes plain for times you spend out of house. bitte markieren Sie die Zeiten, die Sie zu Hause verbringen, lassen Sie die übrigen Kästchen leer.	
		from	until
		0:00	0:30
		0:30	1:00
		1:00	1:30
		1:30	2:00
		2:00	2:30
		2:30	3:00
		3:00	3:30
		3:30	4:00
		4:00	4:30
		4:30	5:00
		5:00	5:30
		5:30	6:00
		6:00	6:30
		6:30	7:00
		7:00	7:30
		7:30	8:00
		8:00	8:30
		8:30	9:00
		9:00	9:30
		9:30	10:00
		10:00	10:30
		10:30	11:00
		11:00	11:30
		11:30	12:00
		12:00	12:30
		12:30	13:00
		13:00	13:30
		13:30	14:00
		14:00	14:30
		14:30	15:00
		15:00	15:30
		15:30	16:00
		16:00	16:30
		16:30	17:00
		17:00	17:30
		17:30	18:00
		18:00	18:30
		18:30	19:00
		19:00	19:30
		19:30	20:00
		20:00	20:30
		20:30	21:00
		21:00	21:30
		21:30	22:00
		22:00	22:30
		22:30	23:00
		23:00	23:30
		23:30	0:00

6 Employment status employed self-employed unemployed student in training
 Erwerbsstatus angestellt selbständig ohne Anstellung Student/in in Ausbildung

retired other, please state

Rentner anderes, bitte angeben

7 Do you work full-time? part-time? without clearly defined timeframe?
 Arbeiten Sie Vollzeit Teilzeit ohne fixe Arbeitszeiten

8 Do you work at home, even if it's just occasionally? Yes No
 Arbeiten Sie (wenn auch nur gelegentlich) von zu Hause? Ja Nein

9 If Yes, how many hours on these days on average? Mo Tu We Th Fr Sa Su
 Wenn Ja, wie viele Stunden an diesen Tagen durchschnittlich? Mo Di Mi Do Fr Sa So

10 Do you regularly stay overnight away from home for business trips or similar? Yes No
 Verbringen Sie auf Geschäftsreisen oder ähnlichem regelmäßig Nächte außerhalb Ihrer Wohnung? Ja Nein

11 If yes, how many nights per month do you spend on average outside your flat? Days / Month
 Wenn Ja, wie viele Nächte pro Monat verbringen Sie durchschnittlich ausserhalb Ihrer Wohnung? Tage / Monat

12 Roughly, how many days of holiday do you take per year? Days
 Wie viele Urlaubstage nehmen Sie ungefähr pro Jahr? Tage

13 Out of these holidays, how many days and nights do you spend away from your home? Days
 Von diesen Urlaubstagen, wie viele Tage und Nächte verbringen Sie nicht zu Hause (z.B. auf Reise im Hotel o.ä...)? Tage

14 Where is your house/flat? Postcode City Country
 Wo ist Ihre Wohnung / Ihr Haus? PLZ Ort Land

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- Bedrooms
Schlafzimmer
- Livingrooms
Wohnzimmer
- Kitchen or Kitchen-Diner
Küche oder Wohnküche
- Bathroom
Badezimmer
- WC (separate)
Extra WC
-

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Größe ihrer Wohnung / ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Months
Monate Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player
MP3 Spieler Tablet PC (iPad)
Tablett PC (z.B. iPad) Smartphone
Smartphone Kindle or other eReader
Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?

Not likely at all
Überhaupt nicht wahrscheinlich unlikely
unwahrscheinlich don't know
ich weiß nicht likely
wahrscheinlich very likely
sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is
Ich weiß nicht was die Cloud ist Yes
Ja No
Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is
Ich weiß nicht was Facebook ist Yes
Ja No
Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? Hours/Week
Stunden / Woche

25 Personal information: Gender? female
weiblich male
männlich
Persönliche Informationen: Geschlecht
Age? 20 - 30 30 - 40 40 - 50 50 - 60 > 60
Alter

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

- a) Safe as pdf document and send to
Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) Print out
Drucken Sie den Fragebogen aus

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and fax to: +49 (0)89.95 474 526
und faxen ihn an:

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

15 How many rooms of the following category does your flat/house have?
Wie viele Zimmer der folgenden Kategorien hat Ihre Wohnung / Ihr Haus?

- Bedrooms
Schlafzimmer
- Livingrooms
Wohnzimmer
- Kitchen or Kitchen-Diner
Küche oder Wohnküche
- Bathroom
Badezimmer
- WC (separate)
Extra WC

other rooms: (please state)
andere Zimmer (bitte nennen)

16 How big is the flat / house you live in? < 20 m² 30 - 40 m² 50 - 60 m² 70 - 80 m² 100 - 120 m²
Größe ihrer Wohnung / ihres Hauses? 20 - 30 m² 40 - 50 m² 60 - 70 m² 80 - 100 m² > 120 m²

17 For how long have you been living in your current flat/house?
Wie lange leben Sie schon in Ihrer jetzigen Wohnung / Haus? Months
Monate Years
Jahre

18 From now, for how long are you planning to keep staying in the flat/house you currently live in?
Ab heute, für wie lange haben Sie vor, in Ihrer jetzigen Wohnung / Haus noch zu wohnen? Months
Monate Years
Jahre

19 Do you own or do you rent the place you live in?
Sind Sie Eigentümer/In oder Mieter/In der von Ihnen bewohnten Immobilie? own
Eigentümer/In rent
Mieter/In

20 Do you use any of these items?
Benutzen Sie eines dieser Geräte? MP3 Player Tablet PC (iPad) Smartphone Kindle or other eReader
MP3 Spieler Tablett PC (z.B. iPad) Smartphone Kindle oder anderes E-Lesegerät

21 In your opinion, how likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?
Wie wahrscheinlich ist es Ihrer Meinung nach, daß die zuvor genannten Geräte (oder digitale Speichertechniken allgemein) persönliche Buch-, Musik-, Film- oder Fotografie-Sammlungen in der Zukunft ersetzen?
Not likely at all unlikely don't know likely very likely
Überhaupt nicht wahrscheinlich unwahrscheinlich ich weiß nicht wahrscheinlich sehr wahrscheinlich

22 Do you store any data in the cloud?
Speichern Sie Daten in der Cloud? I don't know what the cloud is Yes No
Ich weiß nicht was die Cloud ist Ja Nein

23 Are you on Facebook or any other social network?
Sind sie auf Facebook oder in irgendeinem anderen sozialen Netzwerk? I don't know what Facebook is Yes No
Ich weiß nicht was Facebook ist Ja Nein

24 How many hours of your free time do you spend per week on the internet?
Wie viel Freizeit verbringen Sie im Internet? 10 Hours/Week
Stunden / Woche

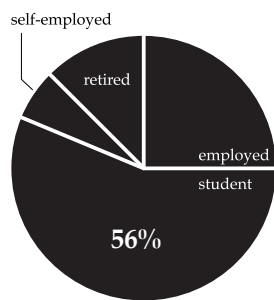
25 Personal information:
Persönliche Informationen: Gender? Geschlecht female male
weiblich männlich
Age? Alter 20 - 30 30 - 40 40 - 50 50 - 60 > 60

Thank you very much for your effort. To return this form, please chose one of the following options:
Vielen Dank für Ihre Bemühungen. Um diese Umfrage zurückzuschicken, wählen Sie bitte eine der folgenden Möglichkeiten

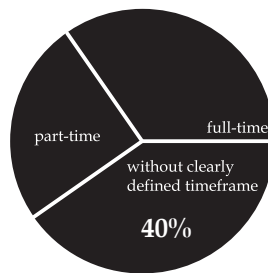
- a) Safe as pdf document and send to florian.wurfbaum@network.rca.ac.uk
Speichern Sie das PDF- Dokument unter einem anderen Namen und senden es an
- b) Print out and fax to: +49 (0)89.95 474 526
Drucken Sie den Fragebogen aus und faxen ihn an:

Thank you very much for your support --- Vielen Dank für Ihre Unterstützung

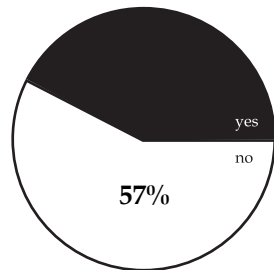
06 | Employment status



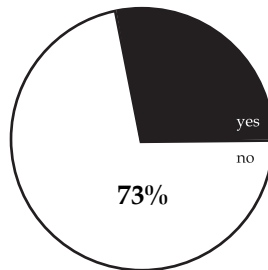
07 | Do you work



08 | Do you work at home, even if it's just occasionally?

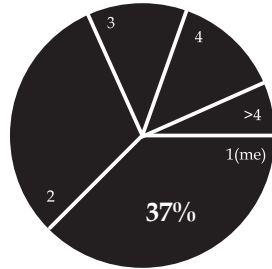


10 | Do you regularly stay overnight away from home for businessstrips or similar ?



House

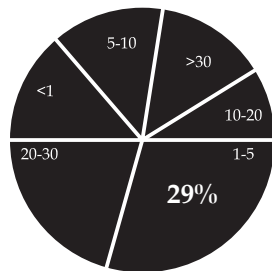
01 | How many persons all together live in your household?



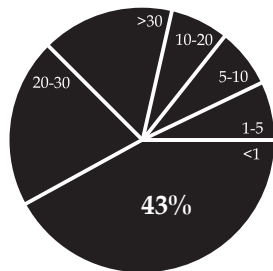
15 | How many rooms of the following category does your flat/house have?



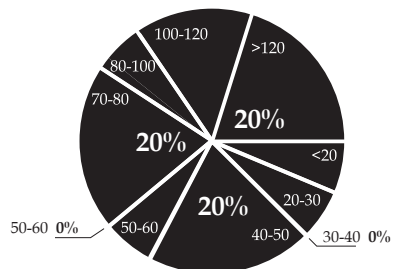
17 | For how long have you been living in your current flat/house? [year]



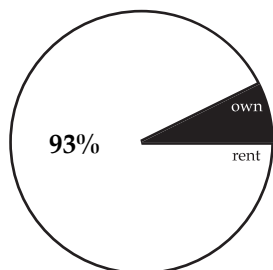
18 | From now, for how long are you planning to keep staying in the flat/house you currently live in? [year]



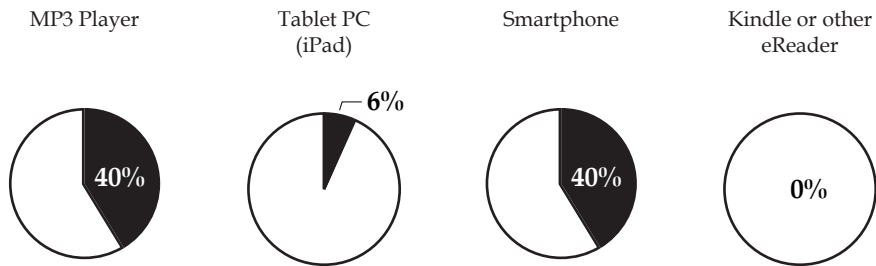
16 | How big is the flat / house you live in? [m²]



19 | Do you own or do you rent the place you live in?



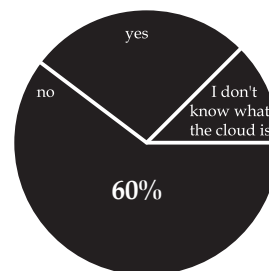
20 | Do you use any of these items?



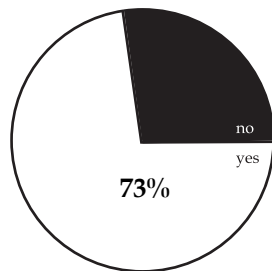
21 | How likely is it, that devices like the ones above and digital storage techniques will replace personal physical collections of books, music, videos, photographs and similar digitalizable objects in the future?



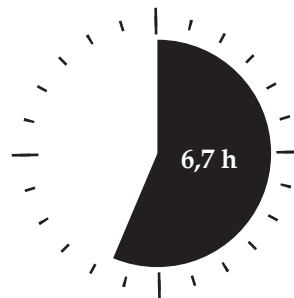
22 | Do you store any data in the cloud?



23 | Are you on Facebook or any other social network?

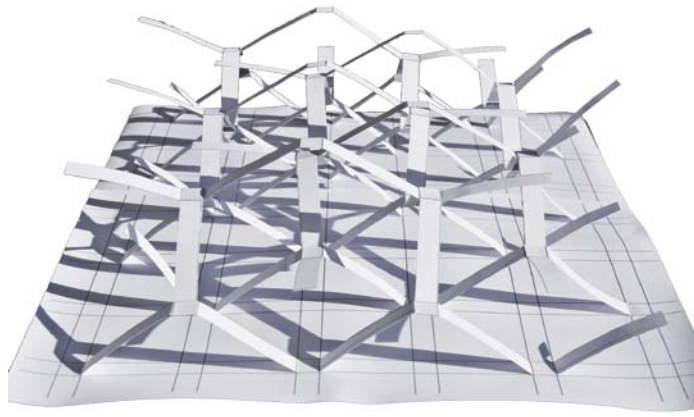


24 | How many hours of your free time do you spend per week on the internet?

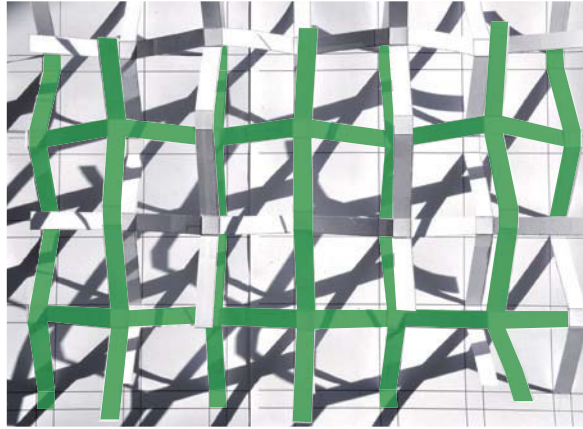


APPENDIX A.4 - ELASTIC ARCHITECTURE SERIES (RE. CH. 5)

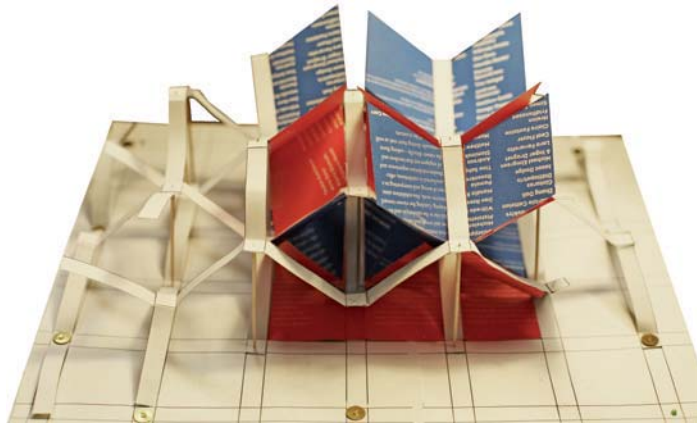
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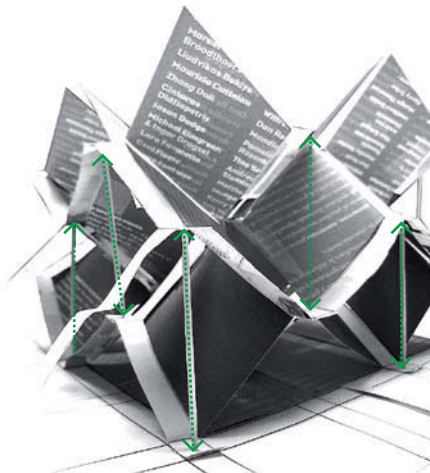
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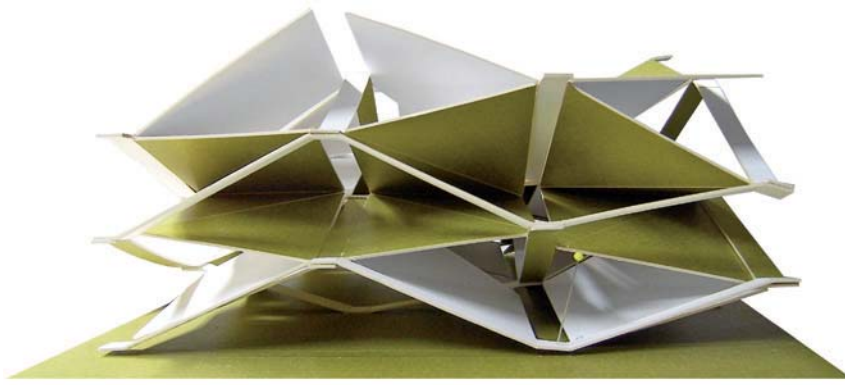


c

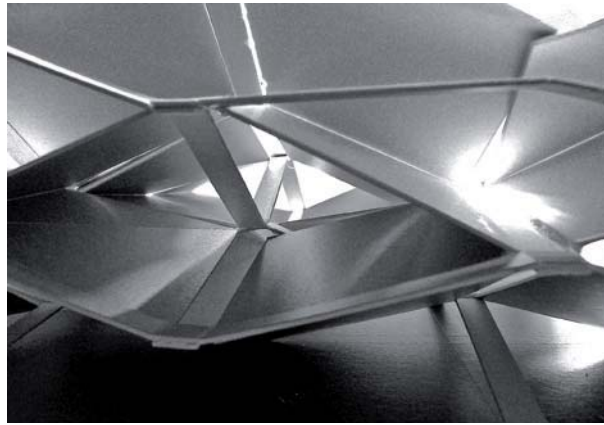


d

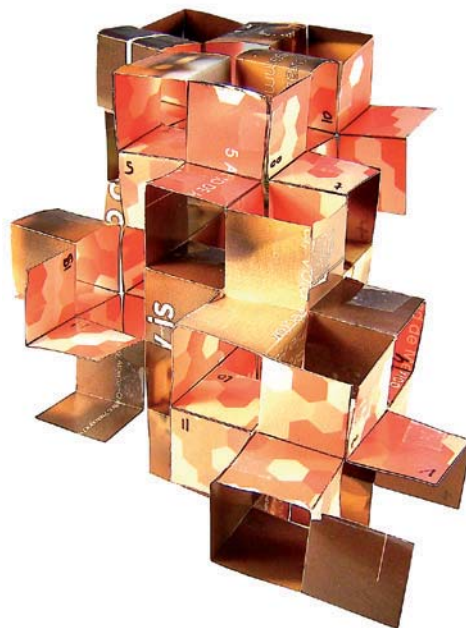




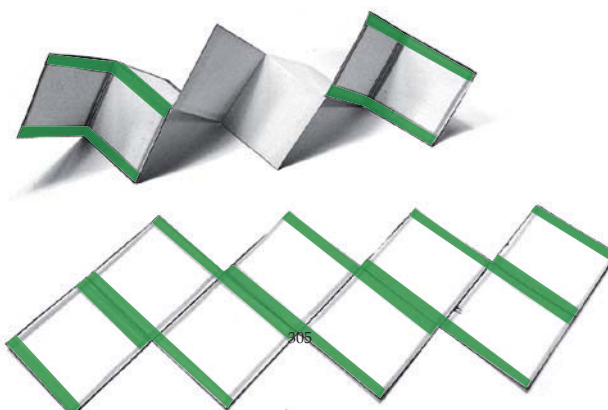
a



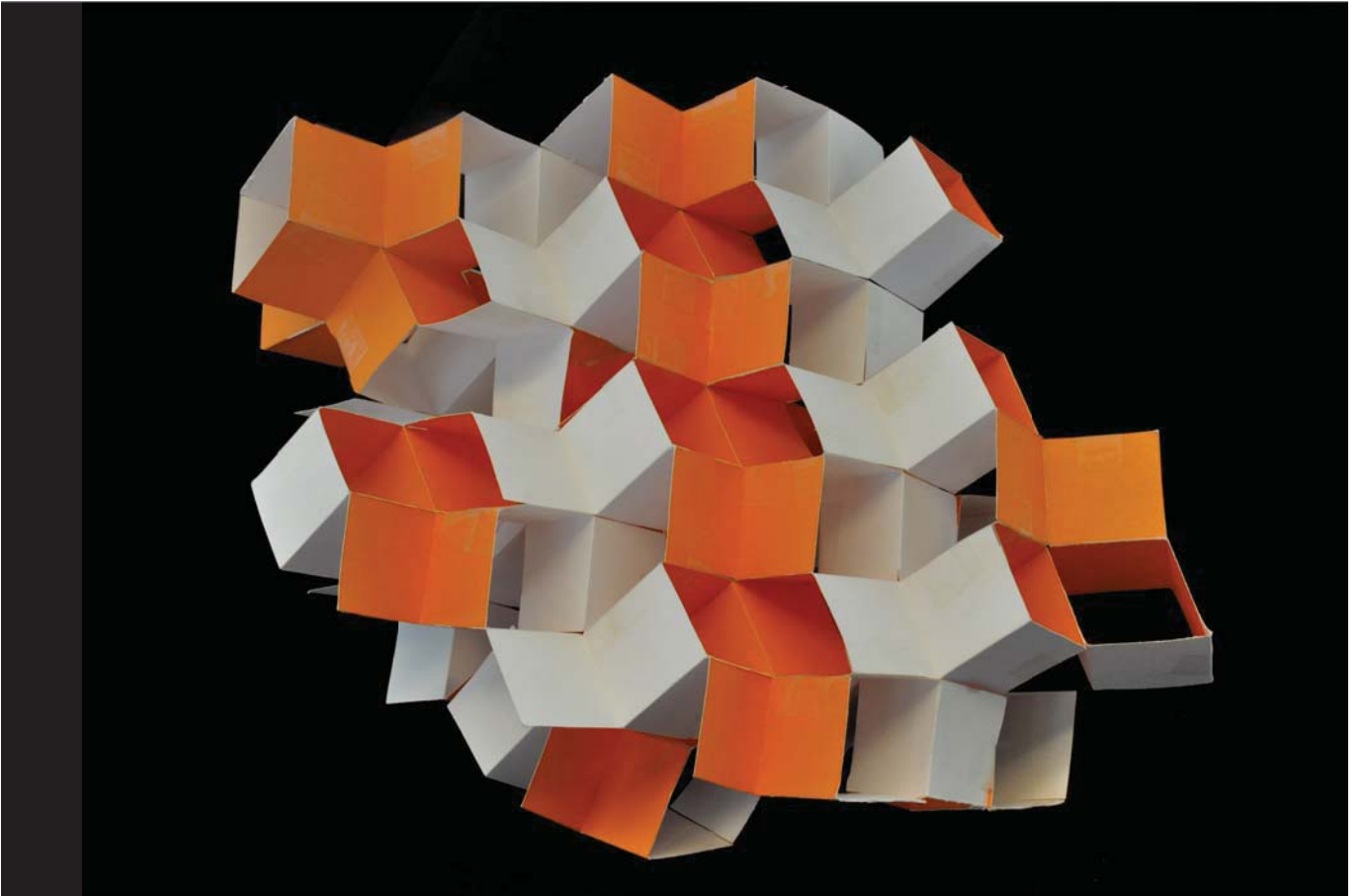
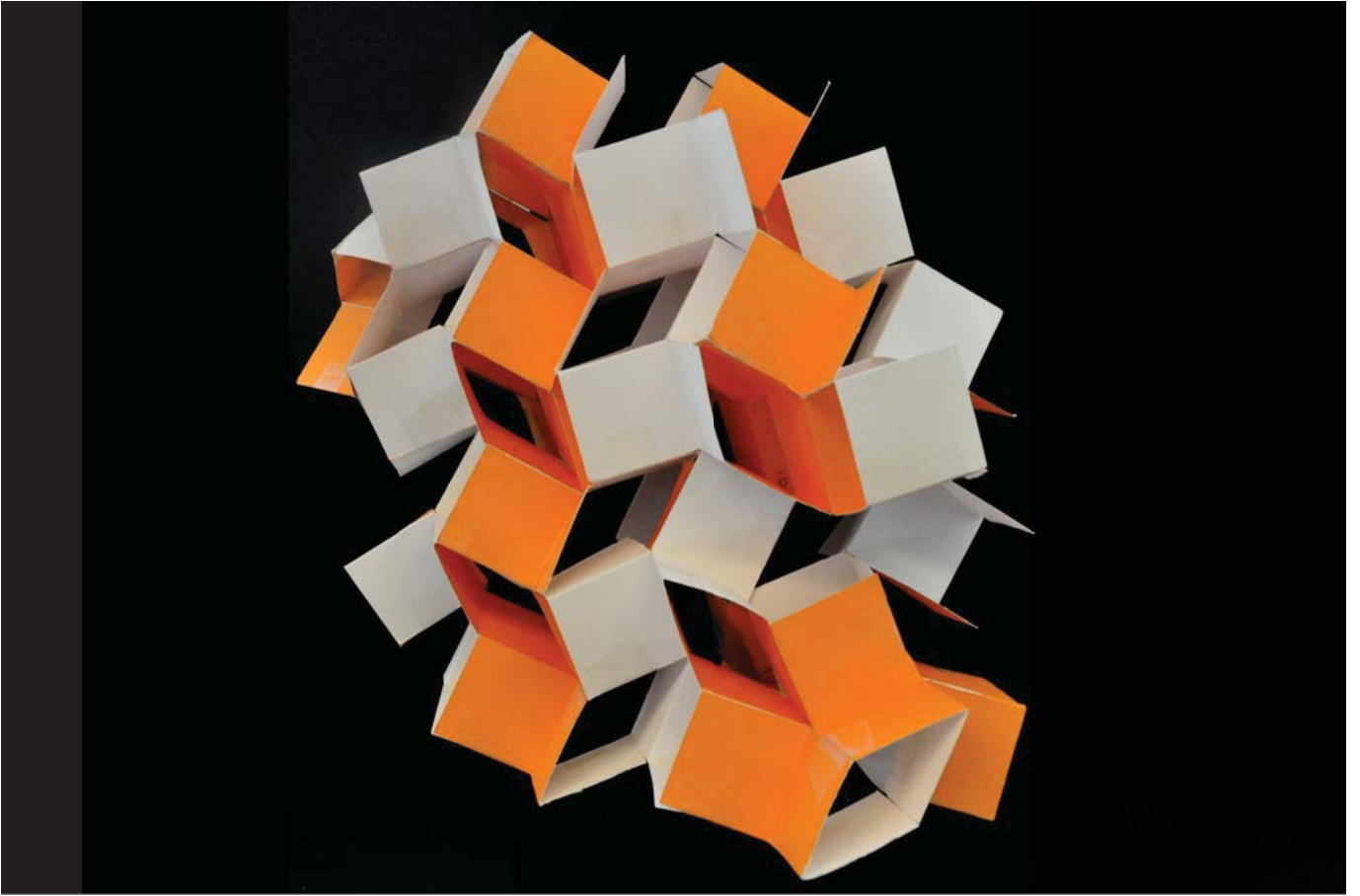
b



c



d



APPENDIX A.5 - SPREADSHEET CALCULATIONS (RE. CH. 6)

TRACKS PERFORMANCE

Time	Dwelling / Office																																
	Anna 1=occ'd	Office 1 1=occ'd	Bruno 1=occ'd	Office 2 1=occ'd	Claudia 1=occ'd	Office 3 1=occ'd	Daniel 1=occ'd	Office 4 1=occ'd	Elisabeth 1=occ'd	Office 5 1=occ'd	Frank 1=occ'd	Meeting 1 1=occ'd	Greta 1=occ'd																				
00:00	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
00:30	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
01:00	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
01:30	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
02:00	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
02:30	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
03:00	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
03:30	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
04:00	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
04:30	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
05:00	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
05:30	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
06:00	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
06:30	●	31,05	●	31,05	●	31,05	●	31,05	●	31,05	●	31,05	●	31,05																			
07:00	●	31,05	●	31,05	●	31,05	●	31,05	●	31,05	●	31,05	●	31,05																			
07:30	●	32,48	●	32,48	●	32,48	●	32,48	●	32,48	●	32,48	●	32,48																			
08:00	●	29,81	●	29,81	●	29,81	●	29,81	●	29,81	●	29,81	●	29,81																			
08:30	●	34,15	●	34,15	●	34,15	●	34,15	●	34,15	●	34,15	●	34,15																			
09:00	●	32,48	●	32,48	●	32,48	●	32,48	●	32,48	●	32,48	●	32,48																			
09:30	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13	●	36,13																			
10:00	●	32,48	●	32,48	●	32,48	●	32,48	●	32,48	●	32,48	●	32,48																			
10:30	●	32,48	●	32,48	●	32,48	●	32,48	●	32,48	●	32,48	●	32,48																			
11:00	●	34,15	●	34,15	●	34,15	●	34,15	●	34,15	●	34,15	●	34,15																			
11:30	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68																			
12:00	●	55,89	●	55,89	●	55,89	●	55,89	●	55,89	●	55,89	●	55,89																			
12:30	●	55,89	●	55,89	●	55,89	●	55,89	●	55,89	●	55,89	●	55,89																			
13:00	●	45,02	●	45,02	●	45,02	●	45,02	●	45,02	●	45,02	●	45,02																			
13:30	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50																			
14:00	●	41,40	●	41,40	●	41,40	●	41,40	●	41,40	●	41,40	●	41,40																			
14:30	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50																			
15:00	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50																			
15:30	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50																			
16:00	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50																			
16:30	●	45,02	●	45,02	●	45,02	●	45,02	●	45,02	●	45,02	●	45,02																			
17:00	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68																			
17:30	●	55,89	●	55,89	●	55,89	●	55,89	●	55,89	●	55,89	●	55,89																			
18:00	●	55,89	●	55,89	●	55,89	●	55,89	●	55,89	●	55,89	●	55,89																			
18:30	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68																			
19:00	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68																			
19:30	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68																			
20:00	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68	●	49,68																			
20:30	●	41,40	●	41,40	●	41,40	●	41,40	●	41,40	●	41,40	●	41,40																			
21:00	●	41,40	●	41,40	●	41,40	●	41,40	●	41,40	●	41,40	●	41,40																			
21:30	●	41,40	●	41,40	●	41,40	●	41,40	●	41,40	●	41,40	●	41,40																			
22:00	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50																			
22:30	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50																			
23:00	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50																			
23:30	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50	●	38,50																			
	23	1.288,22	22	682,81	34	1.272,87	20	638,22	44	1.713,25	15	566,49	28	1.055,47	22	874,89	24	909,35	15	577,86	37	1.434,33	7	246,40	31	1.253,69	14						
	hours	avr. m²	urs	avr. m²	urs	avr. m²	urs	avr. m²	urs	avr. m²	urs	avr. m²	urs	avr. m²	urs	avr. m²	urs	avr. m²	urs	avr. m²	urs	avr. m²	urs	avr. m²	urs	avr. m²	urs	avr. m²	urs				
hours of dwelling occupation	16,50			17,00				22,00					14,00																				
average dwelling roomsize		39,04			37,44				38,94					37,70																			
hours of office occupation		9,00			8,00				7,50					11,00																			
average office roomsize				37,93				39,89						37,77																			
	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24		
dwelling occupation rate per day	0,69			0,71				0,92					0,58																				
office occupation rate per day		0,38			0,33				0,31					0,46																			

CURTAINS PERFORMANCE

Time	Check	Dwelling / Office	Anna	Office 1	Bruno	Office 2	Claudia	Office 3	Daniel	Office 4	Elisabeth	Office 5	Frank	Meeting 1	Greta	
			1=used	1=used	1=occ'd	1=occ'd	1=occ'd	1=occ'd	1=occ'd	1=occ'd	1=occ'd	1=occ'd	1=occ'd	1=occ'd	1=occ'd	1=occ'd
00:00	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
00:30	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
01:00	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
01:30	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
02:00	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
02:30	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
03:00	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
03:30	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
04:00	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
04:30	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
05:00	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
05:30	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
06:00	✔		32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	9,07	40,25	
06:30	✔		24,66	24,66	32,46	9,07	40,25	9,07	32,46	24,66	32,46	9,07	40,25	9,07	40,25	
07:00	✔		24,66	24,66	32,46	9,07	40,25	9,07	32,46	24,66	24,66	24,66	32,46	9,07	40,25	
07:30	✔		24,66	24,66	24,66	24,66	32,46	9,07	32,46	32,46	9,07	32,46	32,46	9,07	9,07	
08:00	✔		24,66	24,66	24,66	24,66	24,66	24,66	24,66	32,46	9,07	32,46	24,66	44,15	9,07	
08:30	✔		24,66	24,66	32,46	9,07	32,46	24,66	24,66	32,46	9,07	32,46	32,46	9,07	9,07	
09:00	✔		24,66	24,66	32,46	9,07	32,46	32,46	9,07	40,25	9,07	32,46	24,66	32,46	9,07	
09:30	✔		9,07	40,25	24,66	24,66	24,66	48,05	9,07	9,07	9,07	48,05	24,66	45,45	9,07	
10:00	✔		9,07	40,25	24,66	24,66	24,66	32,46	9,07	40,25	9,07	32,46	24,66	45,45	9,07	
10:30	✔		9,07	40,25	24,66	24,66	24,66	32,46	9,07	40,25	9,07	32,46	32,46	9,07	9,07	
11:00	✔		9,07	9,07	32,46	24,66	24,66	32,46	9,07	40,25	9,07	32,46	32,46	9,07	9,07	
11:30	✔		9,07	9,07	9,07	83,13	9,07	9,07	9,07	83,13	9,07	9,07	40,25	9,07	9,07	
12:00	✔		9,07	87,02	9,07	9,07	9,07	9,07	9,07	9,07	9,07	87,02	32,46	9,07	9,07	
12:30	✔		9,07	79,23	9,07	9,07	9,07	79,23	9,07	9,07	9,07	79,23	9,07	9,07	9,07	
13:00	✔		9,07	47,29	9,07	47,29	9,07	47,29	9,07	47,29	9,07	47,29	9,07	9,07	47,29	
13:30	✔		9,07	48,50	9,07	32,46	24,66	42,20	9,07	42,20	9,07	42,20	9,07	9,07	9,07	
14:00	✔		9,07	48,50	9,07	32,46	24,66	53,24	9,07	53,24	9,07	53,24	9,07	9,07	9,07	
14:30	✔		9,07	71,42	9,07	9,07	24,66	32,46	9,07	40,25	9,07	40,25	9,07	40,25	9,07	
15:00	✔		9,07	48,50	9,07	32,46	24,66	42,20	9,07	42,20	9,07	42,20	9,07	42,20	9,07	
15:30	✔		9,07	48,50	9,07	32,46	24,66	42,20	9,07	42,20	9,07	9,07	9,07	42,20	9,07	
16:00	✔		9,07	48,50	9,07	32,46	24,66	55,84	9,07	55,84	9,07	9,07	9,07	9,07	32,46	
16:30	✔		32,46	9,07	9,07	48,05	32,46	9,07	9,07	102,61	9,07	9,07	9,07	9,07	32,46	
17:00	✔		32,46	9,07	9,07	48,05	32,46	9,07	9,07	102,61	9,07	9,07	9,07	9,07	40,25	
17:30	✔		9,07	9,07	9,07	71,43	32,46	9,07	9,07	102,61	9,07	9,07	9,07	9,07	40,25	
18:00	✔		32,46	9,07	9,07	9,07	40,25	9,07	9,07	71,43	9,07	9,07	40,25	9,07	40,25	
18:30	✔		32,46	9,07	40,25	9,07	40,25	9,07	9,07	71,43	9,07	9,07	40,25	9,07	40,25	
19:00	✔		32,46	9,07	40,25	9,07	40,25	9,07	9,07	9,07	9,07	40,25	9,07	9,07	40,25	
19:30	✔		32,46	9,07	40,25	9,07	40,25	9,07	9,07	9,07	40,25	9,07	40,25	9,07	40,25	
20:00	✔		32,46	9,07	40,25	9,07	40,25	9,07	9,07	9,07	40,25	9,07	40,25	9,07	40,25	
20:30	✔		32,46	9,07	40,25	9,07	40,25	9,07	9,07	9,07	40,25	9,07	40,25	9,07	40,25	
21:00	✔		32,46	9,07	40,25	9,07	40,25	9,07	9,07	9,07	40,25	9,07	40,25	9,07	40,25	
21:30	✔		32,46	9,07	40,25	9,07	40,25	9,07	9,07	9,07	40,25	9,07	40,25	9,07	40,25	
22:00	✔		32,46	9,07	40,25	9,07	40,25	9,07	9,07	9,07	40,25	9,07	40,25	9,07	40,25	
22:30	✔		32,46	9,07	40,25	9,07	40,25	9,07	9,07	9,07	40,25	9,07	40,25	9,07	40,25	
23:00	✔		32,46	9,07	40,25	9,07	40,25	9,07	9,07	9,07	40,25	9,07	40,25	9,07	40,25	
23:30	✔		32,46	9,07	40,25	9,07	40,25	9,07	9,07	9,07	40,25	9,07	40,25	9,07	40,25	
total			33	1.160,43	950,36	1.378,58	762,39	1.589,05	921,18	1.253,85	1.400,55	1.160,30	981,60	1.479,91	527,98	1.386,36
total when present			hours	1.024,38	678,26	1.251,60	472,15	1.552,77	621,87	1.072,45	1.164,73	942,62	691,36	1.380,14	156,11	1.232,17
hours of dwelling occupation			17		17,00		22,00		14,00		12,00		18,50		15,50	
average dwelling roomsize				31,04		36,81		35,29		38,30		39,28		37,30		39,75
hours of office occupation				9,00		8,00		7,50		11,00		8,00		3,50		7,00
average office roomsize					37,68		29,51		41,46		52,94		43,21		22,30	
dwelling occupation rate per day			/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24	/24
office occupation rate per day			0,69	0,38	0,71	0,33	0,92	0,31	0,58	0,46	0,50	0,33	0,77	0,15	0,65	0,29

APPENDIX A.6 MANAGEMENT & OWNERSHIP

APPENDIX A.6.1 - MANAGEMENT STRUCTURES AND FORMS OF
OWNERSHIP FOR THE PROPOSED CASE
STUDIES (RE. CH. 6)

APPENDIX A.6.2 - AN ALTERNATIVE MODEL OF USAGE:
THE COMBINATION OF A HOTEL WITH DAY
OFFICES (RE. CH. 6)

APPENDIX A.6.1 – MANAGEMENT STRUCTURES AND FORMS OF OWNERSHIP FOR THE PROPOSED CASE STUDIES (RE. CH. 6)

Though not directly discussed in the body of text of the thesis, the design of this system can be extended to the management structure and forms of ownership. Each scenario discussed has been designed implying a specific form of ownership and management structure which I briefly want to discuss in regards to their potential to support the proposal:

Definition of the space to be owned / rented

In a first instance it is necessary to define what is to be owned or rented. When dealing with architectural structures that have changing spatial borders, defining a space as something to be owned, by assigning it a fixed spatial volume or area is important.

The concept of ownership for the proposed case studies is rooted in what I defined as the basis configuration¹. Here the quantity of space is defined as if the spaces did not have dynamic properties. It represents the space which is guaranteed to each user, if all users are present at the same time. This spatial configuration is also the basis configuration.

So what can be owned is the area correspondent to the single guaranteed space. All mutations of that guaranteed space resulting in additional space are regarded as a free benefit, with no further cost. This benefit is intended to be the stimulus and motivation to participate in the system. The more people who participate (and, when absent, make their space available to others), the larger can be the gain for each present participant.

¹ see also chapter 6.7.1 in the main text

There could be envisioned systems of remuneration for the provision of space. However, in the context of the current study this is not intended as it could have a contradictory effect on the desired system.

Four scenarios of ownership

Scenario A is a conventional property developer project, where the property is split (and sold) as smaller spatial entities (e.g. flats or confined offices) and where several owners own single parts of the building.

Scenario B is a developer-led project combining offices and dwellings, both for renting.

Scenario C is a cooperative housing scheme, owning the entire building in collaborative ownership.

Scenario D is a public project where the whole property is in single ownership e.g. that of the city of Munich (as proposed in the case studies). Here the office parts are occupied by the administration of Munich and the dwelling units can be rented out by the city of Munich either as conventional studio flats or as student accommodation.

To evaluate these scenarios the following factors need to be taken into account:

- The technical complexity of the operation of moving elements and infrastructures.
- The responsibility of the operator regarding the handling of private and sensitive information. This is only to a certain extent in the control of the operator (the owner(s) or the manager) of the building: in the system which physically moves the walls and the application software where the needed information is stored. (There is a chain of instances in processing, storing and transmitting the information which is in the control of third parties, e.g.

telecommunications network, geo-positioning system, operating system).

- The specific judicial differences between the tenancy law for housing and the tenancy law for commercially used property in Germany. Tenants of dwellings are protected and fixed-term tenancy agreements can only be made under certain restrictive conditions² (student accommodation in dedicated student homes is an exception)³.
- The multiplicity of moving elements and infrastructure makes the definition of borders complex.
- The designs proposed in the case studies rely on office hours being fixed and constant.
- The designs proposed in the case studies are spatially based on individual small dwelling units placed into an office environment and using the offices' corridors and pathways to access the flats.

Looking at these factors, to split the building into fractions of ownership **Scenario A** (conventional property developer project) appears implausible. This form of ownership should only be taken into consideration once a project like this is beyond the status of an experiment. An established system with enough experience gained would be needed to evaluate possible neighbourhood issues with all their legal implications.

Evaluating **Scenario B** (developer-led project), assuring complementarity of use at different times could be problematic. This system could only work if the tenants of the offices had predominantly strict working times, possibly securely enforced by the staff association (compare also chapter 6.3). In

² '§ 575 BGB Zeitmietvertrag - Dejure.org' <<http://dejure.org/gesetze/BGB/575.html>> [accessed 11 May 2015].

³ '§ 549 BGB Auf Wohnraummietverhältnisse Anwendbare Vorschriften - Dejure.org' <<http://dejure.org/gesetze/BGB/549.html>> [accessed 11 May 2015].

Germany staff associations are common in any bigger company, e.g. in 2013 73% of companies with 200-500 staff had one, as did 61% of the companies with 101-199 staff. The bigger the company, the better the employees are organized⁴. In regards to tenancy agreements for this scenario, different possibilities would need to be investigated as during the initial experimental phase it would be an advantage to allow for fixed-term tenancy contracts.

One aspect of **Scenario C** (cooperative housing scheme) is that the cooperative scheme assures that all members have the possibility to establish and adjust the rules of operation. This can be evaluated as positive from a democratic aspect and as an effective way to monitor the operational management entity. Especially in regards to the control of sensitive data, this is evaluated as a relevant point.

One challenging aspect of the cooperative scenario is the initial investment of such a scheme, if a new housing cooperative would have to be founded for this purpose. The initial investment of such a scheme should consist of: acquiring land or buildings that suit people (members) with long-term aspirations to join the property-ladder (being potentially able to live within the cooperative for a long period). This will have an impact on the typology of studio flats and the envisioned user group; for instance, students or young professionals would not fit these conditions. A possible scenario would be to have as adequate investor an already established housing cooperative with sufficient liquidity, like some of the more than 100-year old cooperatives in Munich. There are cooperatives which actively look for new sites to erect new buildings. They would be an ideal developer to include students or young professionals as they could join the cooperative. Once these flats no longer suited their spatial requirements they could move to other flats in the cooperative (a current practice in Munich). It is important to note that people in Germany join a Genossenschaft⁵ with the goal to live there potentially their whole life. Waiting lists are long due to the low rent

⁴ 'Qualität Der Arbeit - Qualität Der Arbeit - Statistisches Bundesamt (Destatis)' <https://www.destatis.de/DE/ZahlenFakten/Indikatoren/QualitaetArbeit/QualitaetDerArbeit.html?cms_gtp=318944_slot%253D5> [accessed 4 June 2015].

⁵ Genossenschaft (German) = cooperative

increase appeal. If people start as students in such a system they would be able to assure their place in the cooperative and could plan their future moves once they have further spatial requirements. Offices could be rented by the cooperative under certain conditions to new members. There would be the need for negotiation and advantages would have to be weighed up.

Scenario D (public project where the whole property is in single ownership, combining administration offices and student accommodation) appeared the most plausible and it was therefore the chosen one to develop the design research case studies. It is important to take into account the fact that the city of Munich owns the building and is already currently using it as administration offices. It is possible to envision a partnership between the city of Munich and the public institution Studentenwerk München (Munich Student Union) with the aim to provide accommodation for students, within a state-owned building. It could therefore be a beneficial system for both structures: for the city of Munich by generating extra income through 'renting' its space when it is not used, and for the Studentenwerk München by enormous savings in not having to invest in the acquisition of a new plot, in erecting a new building, in infrastructures. For both it could also mean savings in energy consumption. Both structures are publicly owned – Baureferat and Studentenwerk München, therefore it might be easy for its users to trust such a system of distribution. The fact that the German law approves limited period tenancy contracts for student residences would make this scenario feasible even in the experimental initial phase.

APPENDIX A.6.2 – AN ALTERNATIVE MODEL OF USAGE: THE COMBINATION OF A HOTEL WITH DAY OFFICES (RE. CH. 6)

The four scenarios listed above reveal potential limitations to the project in different ownership and management settings, however the complexity involved is intended as the two programmes, office and dwelling, have been identified as the most significant combination.

Another combination with a lower degree of relevance, although practically more feasible, is the complementation of a hotel with day offices. This combination is less complex as the aspects of personalisation and individual unpredictable behaviour of the users and of the building can be disregarded. Here the rigidity of the patterns of use can simply be achieved by a conventional booking system.

Hotel

Many inner city hotels in touristic attractive cities like Munich serve as business hotels from Monday to Friday and at weekends serve leisure guests⁶. From Monday to Thursday, the majority of business travellers stays for only one night, checks in late in the evening and leaves the hotel early in the morning⁷. At weekends leisure guests stay for one or two nights Friday to Saturday and Saturday to Sunday and have a higher tendency to also spend time in the hotel during the day.

On the website [between9and5.com](http://www.between9and5.com)⁸ hotels try to rent their rooms by offering so-called day rooms for the times between 8am and 7pm. This can be seen as an indicator that hotel rooms during daytime are often unused.

⁶ Tobias Warnecke, 'Hotelmarkt Deutschland 2015' (IHA-Service GmbH, 2015), p. 84.

⁷ according to Mr Warnecke, a representative of Germany's hotel lobby in a telephone conversation with the author on 8 May 2015

⁸ 'Day Rooms in 3 to 5 Star Hotels Worldwide' <<https://www.between9and5.com/en/>> [accessed 4 June 2015].

Day Offices

At the same time there is a market for day offices (office rooms rented out by the hour or by the day). Regus, a company that offers day offices, rents out the day offices for the regular hours between 8:30am and 6pm.

Interpreting these facts it could be concluded that the two programmes, City Hotel (for business customers Monday to Thursday, for leisure customers Friday to Sunday) and day offices from Monday to Friday, could prove an interesting time-complementing combination. I regard the proposed technical innovation of this research, especially the case study Tracks applied to the combination of hotel and day offices, as a commercially promising combination of two complementing uses in one building.

APPENDIX A.7 - ESSAYS

A.7.1 - BACK TO DIY - FROM NOMADS TO MONADS

A.7.2 - SHIFTING BOUNDARIES

BACK TO DIY – FROM NOMADS TO MONADS

It appears we are turning back to a society of DIY-ers both voluntary and involuntary. As the distinction between production and consumption blurs, we seem to be turned into generators of our own worlds. This tendency of a society has been pointed out already more than 100 years ago by Gabriel Tarde in his book *Les Lois de L'imitation* (1890): 'The civilised human being of today quests towards the possibility, to relinquish from human support'¹.

Do it yourself (or DIY) is a phrase that became commonly used in the 1950's to express a self-performed act of home-improvement. But DIY is an old idea that already started at the roots of mankind, then became suppressed by the division of labor, money and - much later - mass-production. The renaissance of DIY started with the Arts and Crafts-Movement in the 1900's and DIY as commonly known today had its break-through as a cost-saving activity in the 1940's and later since the 1970's also as a critical political practice. DIY has its preliminary highlight in today's world of individualised items, designed by the consumer who more and more mutates into a producer.

By making a small history of DIY I aim to outline the potential it comprises for contemporary individual living. Equipped with network-based technologies and gadgets like smartphones and Ipads, a new generation of DIY-imprinted practices can be applied to the contemporary home, in a novel concept of "home improvement".

NOMADS, DIY, MONEY, PRODUCTION

Before both the invention of barter and the agrarian revolution (~8000 BC), people in small nomadic societies had to be universally skilled in order to secure self-subsistence. These were hunter-gatherer communities that relied on DIY activities such as preparing food and building temporary shelter. The division of labour was mostly gender-oriented: groups of men would hunt, groups of women would gather². Skills were universal and shared for communal survival, individuals would do it themselves for the good of the community. With the surplus of food human settlements became permanent, trade was introduced and the shift from generalized to individualised skills began. This resulted in a division of labour together with the establishment of the professions and an increase in the specialisation of work. The use of money³ provided comparability, a means of payment and a reservoir of value, which made trade easier. Money proved to be the catalyst for sociological and cultural development, and estimating the value of work and things. Goods were produced according to necessities, and individuals relied on each other's skills to acquire what they needed. This was the prevailing model for many centuries.

Jumping in time to the first industrial revolution in the end of the 18th century, increasingly more and varied goods were produced with mechanization of production. Marketplaces included a greater variety of products and mass production led to mass consumption with the rise of the consumer culture. In the late 19th and early 20th century efficiency in production became the motto (for strategies like 'Taylorism' and later 'Fordism') and the fully specialised worker was born, capable of exactly one specific labour action-movement, infinitely repeated. As reaction to the increasing mechanization of the industrial age, the Arts and Crafts Movement emerged longing-for and developing again a hands-on approach, DIY as a cultural movement.

¹ Free translation by the author. Original quote: '*Der zivilisierte Mensch von heute strebt eigentlich nach der Möglichkeit, auf menschliche Unterstützung zu verzichten.*', Gabriel Tarde, *Die Gesetze der Nachahmung*, a.a.O., S. 87

² There were exceptions in some parts of the world where women would also hunt.

³ The term money was used first around 3000BC

With the post-industrial era new strategies in companies' production, organization and management were developed to increase profit. Outsourcing was one of these strategies. Conventional outsourcing means contracting a third-party in order to optimise the division of labour and to focus on the company's core business. Corporations began to rely on other corporations. Furthermore, (high-)technology and the dissolution of companies into network structures was giving rise to a radical form of outsourcing: the transformation of the consumer into a co-producer. Parts of the production were outsourced to consumers, who in their free time were re-integrated into the process of production.

Strategies and practices like self-service, self-assembling, the phenomenon of mass-customization were all resulting in a re-introduction of DIY in different forms, some of these actions performed unawarely by the consumer.

BACK TO DIY

The self-service concept (patented in 1917) is one example of an imposed DIY generalized in petrol stations since the nineteen-sixties allowing or compelling the consumer to operate the fuel pump himself. Later it would be extended to all sorts of self operated services. Examples include the Ikea furniture brand where the consumer self assembles the unfinished product physically, becoming integrated in a pre-determined production line. The reason for this consumer DIY, is the maximising of profit for companies. The consumer accepts to do his part, as it would allegedly save him money when purchasing the product.

At the same time there are other attractive aspects of DIY that emerged along with technology and became synonyms of freedom of choice and individualism, involving however some effort from the consumer. Using the company DELL as an example, Bruce Sterling writes that 'the catch is that somebody, somewhere has to decide, what to make. Decisions are expensive, the burden of making decisions has to be exported outside the factory, onto (...) the consumer. But it mustn't feel too much like work. (...) Dell's customer does the work for free. This labour process is promoted as "consumer choice" ⁴. Here, the individual is performing the decisions, customizing a product he will acquire, apparently in control of what he chooses to possess. This aspect of DIY emerged with mass-customization and the production of different objects for the individual replacing the paradigm of "one size fits all". This was a reflection of the introduction of the computer and CAD/CAM techniques in production. Nowadays as wide range of digital techniques are becoming increasingly available to the individual, the possibilities for Do-it-Yourself are huge.

The information society, software, technology in a material and immaterial level and portable devices resulted in an increasing auto-sufficiency of the individual. Supported by the digital revolution and the internet, we have begun to do more and more things independently: programming our phones, laptops, designing our cars. Everyone could or had to suddenly become a DIYer in different subjects: I- Publisher, I-Bankers, I- Travelagents, I- Ikeaists, I- Cashiers, I-Marketers, I-Lawyers, I-Doctors, I- Psychotherapists, I-Designers.

DIY, MONADS AND THE APARTMENT

Picking up Leibnitz's term of the Monad, Peter Sloterdijk puts it on the level of the world-cell: A world- prosthesis, capable of constituting a world⁵. According to Sloterdijk the inhabitant of the 'Monad'- apartment generates his own personalized I-world, containing even social replacements or partners. The single apartment can be understood as a studio of self-relations: self-pairing, self-care, self-supplementation, self-modelling⁶. The individual chooses his products,

⁴ Sterling, A talk at the Berlage Institute, in: Sigler, Jennifer, and The Berlage Institute, International Postgraduate Laboratory of Architecture., *Hunch 5 : The Berlage Institute report no. 5, autumn 2002*. (Rotterdam: Berlage Institute, 2002). p. 89

⁵ Interview with Peter Sloterdijk, *Architekten machen nichts anderes als IN- Theorie*, Arch+169/70, May 2004, p. 20

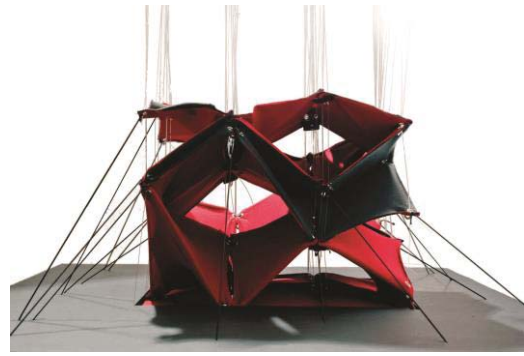
⁶ Free Translation from original quote, Das Apartment laesst sich als Atelier von Selbstverhältnissen verstehen – Selbstpaarung, Selbstsorge, Selbstergänzung, Selbstmodellierung,

the I-items that compose the I-home.

And if the mobile aspects of the 'Monad' are controlled by the individual why not the immobile aspects as well?

As in his book 'Out of Control' Kevin Kelly theorizes about intelligent rooms that could adapt to their owners. One can imagine the apartment even becoming an active counterpart to its inhabitant where spaces can react in real time to the inhabitant's needs, desires and requirements. DIY in the home would be taken further than repairing a pipe and painting a wall but would imply programming by the user, where the I-Flat could be synchronized to a self-made app or gadget (or even to a temporary social media status).

With the support of technology why not see the apartment and its boundaries as a Do-it-yourself- item? It is about to become a matter of time, that not only furniture (mobile) but also buildings (immobile) become fully adaptable entities, reacting to the user and incorporating their desire for DIY as a self- fulfilling designation.



SHIFTING BOUNDARIES

Seismic shift is a metaphor for profound change. Seismology is the scientific study of earthquakes, and of the drifts of the crust that surrounds the earth's sphere. Florian Wurfbaum's essay is about the movement of the boundaries of personal spheres.

(1 - ANECDOTE OF RESTAURANT VISIT)

Some weeks ago I went to a Japanese restaurant with a friend. We were seated in a small room where a couple was already dining. It was a rather intimate atmosphere, especially because the restaurant was almost empty, there was no music and we all sat very close. With my friend, I usually either speak in English or German. Hearing that our neighbours spoke German, automatically we switched our conversation to English, as an unconscious measure to create some space of privacy. Being in a London restaurant we presumed they would understand English and didn't feel like we were hiding something from them. But after we had a great sushi and tempura, just after ordering dessert, our neighbours came to a delicate topic presuming that nobody else in the room would be able to understand their conversation. The conversation between my friend and me stumbled and somehow we both felt uncomfortable listening to their conversation (which was definitely interesting but surely not meant to be heard by us). I felt the need to indicate the lack of a boundary and started to answer my friend in German. Our neighbours realized and in the blink of an eye, their imagined boundaries fell. They appeared shocked about their assumption and about making us unwillingly witness of their conversation.... They changed the subject and spoke at much lower voice.

(2 - ANALYSIS OF EVENTS IN RESTAURANT)

This little episode shows how in constrained situations, people can flexibly reconfigure their personal environment. In an unconscious process the boundaries of the individual personal space¹ can

¹ **Personal space** is the region surrounding a person which they regard as psychologically theirs. Most people value their personal space and feel discomfort, anger, or anxiety when their personal space is encroached (Hall, Edward T. (1966). *The Hidden Dimension*. Anchor 1. Books. ISBN 0-385-08476-5)

be constantly redefined. Here I want to call the personal space the personal sphere as it describes the phenomenon more figuratively. Although it would be a more complex three-dimensional form whose boundaries have variable distances from the body. The boundaries are informed by cultural, gender, social and many other means. In this case the boundary was defined first by language and then, as the language boundary didn't do the job, by volume. What had happened? Before we entered the small room it was filled with the German couple, consisting of two individual personal spheres forming their social space. When we came in they kept the size of their social space by falsely presuming that their neighbours wouldn't understand what they said. My friend and I kept our social space small. Let's say it filled half of the physical space in that small room. During the dinner the social space of the German couple filled the whole room and unwarily encroached our social space. But after they found out that all people in the room did understand their language they immediately adapted and reduced their occupation of physical spaces by talking in a lower voice tone and by changing to a less intimate subject.

(3 – OTHER EXAMPLES)

The personal sphere can be seen as a representation of the real need of physical space. The personal sphere can vary and adapt in size and form, from very big to almost touching the skin. Or it can expand to the limits of the physical space. For example being the last guest in a swimming centre, alone in the water: The feeling of the five minute solely occupation of a space, where the pool and the swimming hall are all mine. Or it can also shrink right to the outer layer of the human clothes like in a ropeway on a busy skiing day.

At home the personal sphere can, but must not fill the available physical space. For example when watching a thriller on TV or working very focused on the computer the personal sphere almost gets redundant. This happens due to the immersion of the individual into a virtual space. Many people, when engaging with mobile technology devices, seem to equally disappear, even in the public. A similar observation can be made in a movie theatre. The powerful presence of the movie leads to a collective disembodiment and a complete unawareness of the space. Normally when thinking about a movie people do not remember if the cinema was sold out or if only few seats were occupied. In this case the personal sphere again is much smaller than the physical space provided.

The adaptability of the personal sphere can be very well observed in the seat occupation pattern in public transport. When entering an almost empty underground carriage it would be regarded as violation of the personal sphere if one would take the seat very next to the only other passenger. But if the very same process would happen in an almost completely occupied carriage it would just be fine.

With every passenger the available space gets re-negotiated and new passengers always disperse themselves in order to maintain a reasonable balance in sharing the available space.

(4 – CONCLUSION)

These processes of adaptive space occupation take place mostly in an unaware way. My personal sphere is always where I physically am. It is a volume with invisible boundaries. I carry it with me all the time and it requires physical space. Sometimes it is bigger, sometimes smaller. But the physical space is only needed where I am at the moment. The ability of our personal sphere to configure and shape itself and also its mobility can inform the design of architectural spaces.

In my research project titled 'the use of the unused space' I am developing architectural speculations inspired by the continuous mutation of the personal sphere and by its space sharing ability in case of multiple occupation of space. The generated spatial entities can react to the user's presence or, maybe even more importantly, to the user's absence. In order to provide shrinking and growing spatial entities, the invisible boundaries become materialized. As a cluster these entities form a tectonic arrangement that shifts with the movements, behaviours and interactions of its users.

APPENDIX A.8 - CASE STUDIES (RE CH. 6)

A.8.1 - TRACKS PROJECT - TECHNICAL DESCRIPTION

A.8.2 - CURTAIN PROJECT - TECHNICAL DESCRIPTION

A.8.3 - CASE STUDY CURTAIN:

ORDER OF SUCCESSION OF MOVEMENTS

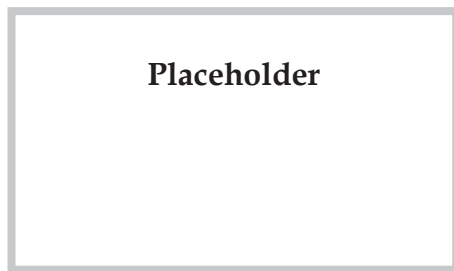
APPENDIX A.8 - CASE STUDIES (RE CH. 6)

A.8.1 - TRACKS PROJECT - TECHNICAL DESCRIPTION

The spatial dynamic properties of *Tracks* are achieved by the combination of different established mechanical tools and techniques. These are:

Tracks: The existing office hollow floor system has enough height to hold two tracks for the moving walls to slide on. The tracks (constructed like rail tracks) assure enough stability for the moving walls. The tracks also spread the weight load over the existing concrete floors.

Sliding dry walls and wet walls



The solution for the movable walls is inspired by moving library shelf systems. These shelves, despite carrying significant weight (5-metre shelf length filled with books on both sides) use a clever but simple mechanical technique to move effortlessly by muscular power (up to 5000 kg per shelf without a motor)¹. The mechanically moving components of the shelves provide the platform on which to mount the *dry wall* and the *wet wall*. The envisioned material for the inhabitable walls is glass fibre reinforced plastic (GRP).

¹ 'Verfahrbare Regale' <<http://www.arbitec-forster.de/index.php?id=975&L=>> [accessed 22 August 2014].

Water circuit (freshwater to waste water)

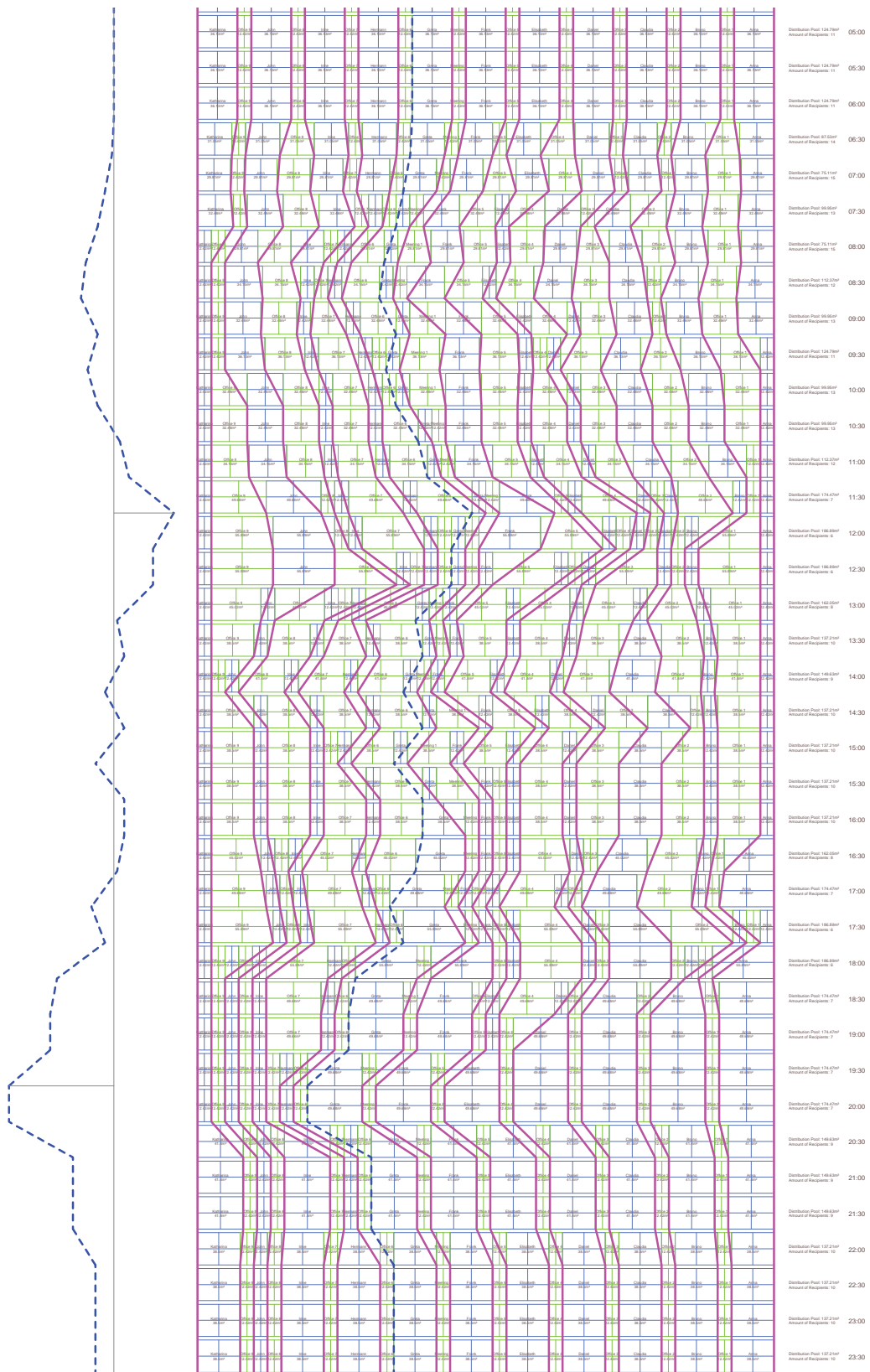
Placeholder

The warm and cold water supply for the moving wet walls is secured by a flexible system of armoured hoses. This is attached to a workshop energy supply chain of movable sliders in a guide track². Inside the *wet walls* the water is distributed with conventional piping. Dirty water is temporarily stored inside the wet wall, like in a camper van. The containers automatically get emptied every time a *wet wall* passes a waste water collection point (when moving over it). From there it goes into the conventional drainage system.

Electricity supply: functions identically to the water supply.

Access doors: Access from the corridor to the individual spaces works by a programmable door system. The separating wall between corridor and single rooms consists entirely of a row of doors. When dwellers or employees aim to enter their space they are automatically guided to the door in front of the current position of their space.

² Woelm Schienen, 'Energiezuführungssysteme'
<http://www.woelm.de/page.php?pid=95&from_id=95> [accessed 26 August 2014].



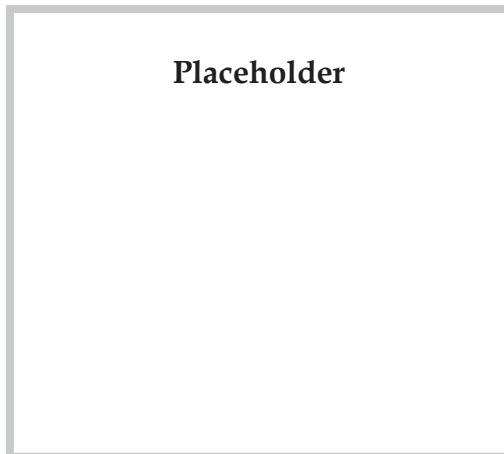
Case Study Tracks:
 Movements of drywalls and wetwalls through the day and element with biggest amplitude (left). Before 6am no changes were recorded.

A.8.2 - CURTAIN PROJECT - TECHNICAL DESCRIPTION

The spatial dynamic properties of the curtain project are achieved by the combination of conventional techniques like moving platforms on guide tracks. Exceptions are the dynamic desk devices (DDD) and the curtain.

The DDDs are envisioned as trolley-style devices. They are desk, computer screen and chair in one combined element. The panoramic touchscreen covers the whole inner side of it and enables paperless operation. The chairs can rotate 360° and in D.2 position (see earlier chapter) can be combined with a meeting table.

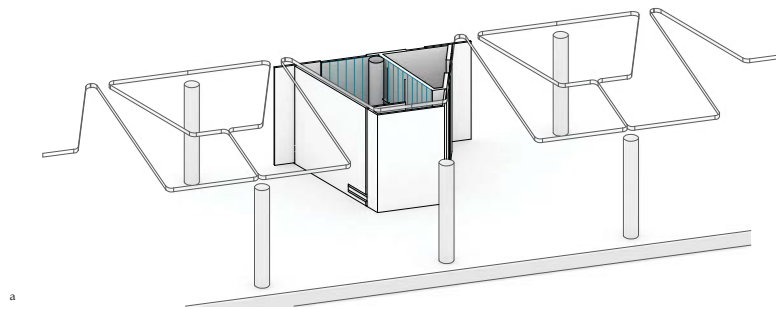
The curtain needs to fulfil the qualities of a partition wall though it also needs to be flexible. The proposed material has been developed by Swiss research institute EMPA in collaboration with textile designer Annette Douglas³ and has sound-absorbing properties.



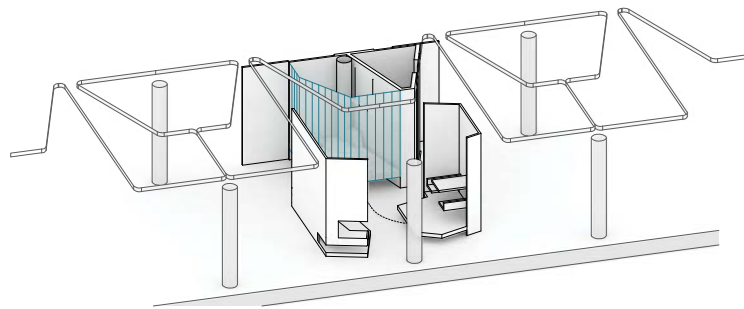
The material is joined with the same technique that Canadian firm Molodesign⁴ uses for their soft wall product. This bellows-style assembly technique allows the curtain to take differing lengths without folding. The many layers multiply the sound-absorbing qualities. With increasing length,

³ 'Empa - Vorhänge, Die Lärm Schlucken (English)' <http://www.empa.ch/plugin/template/empa/1256/106377/---/l=2/changeLang=true/lartid=106377/orga=/type=/theme=/bestellbar=/new_abt=/uacc=>> [accessed 31 August 2014].

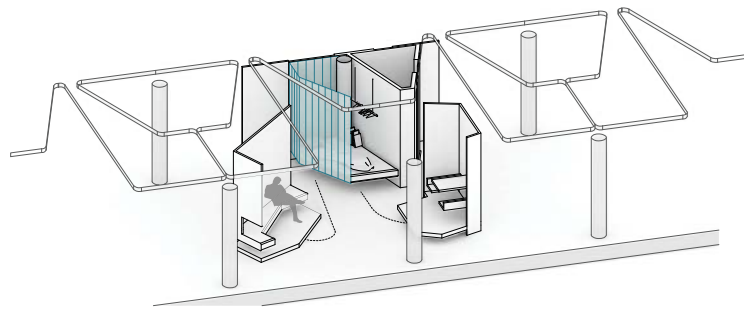
⁴ 'Softwall + Softblock Modulsystem · Molo' <<http://molodesign.com/de/products/softwall-softblock-modular-system/>> [accessed 31 August 2014].



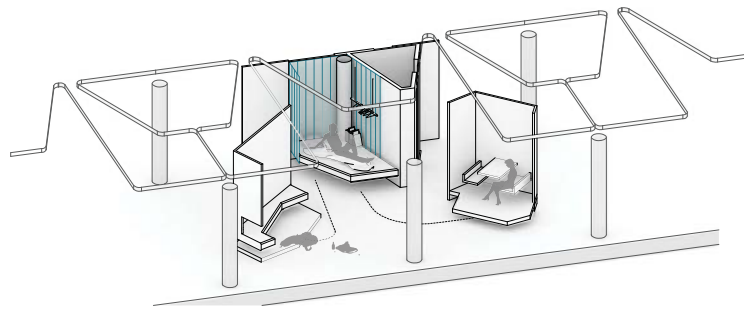
a



b

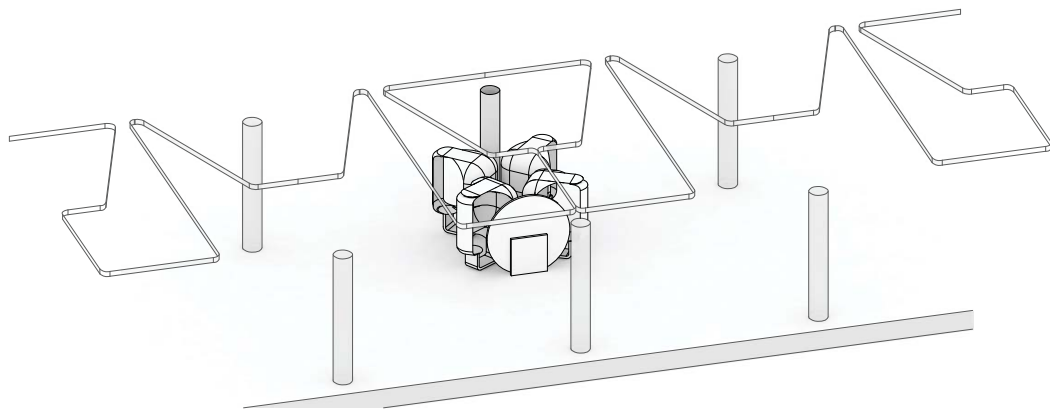


c

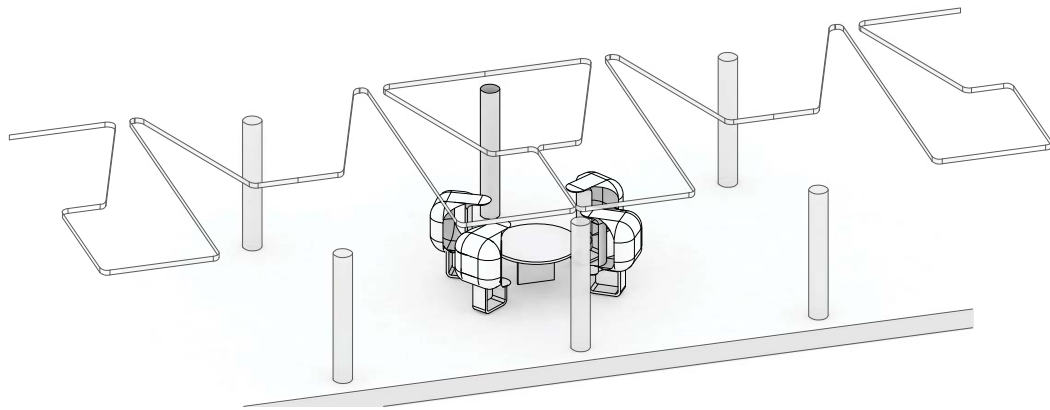


d

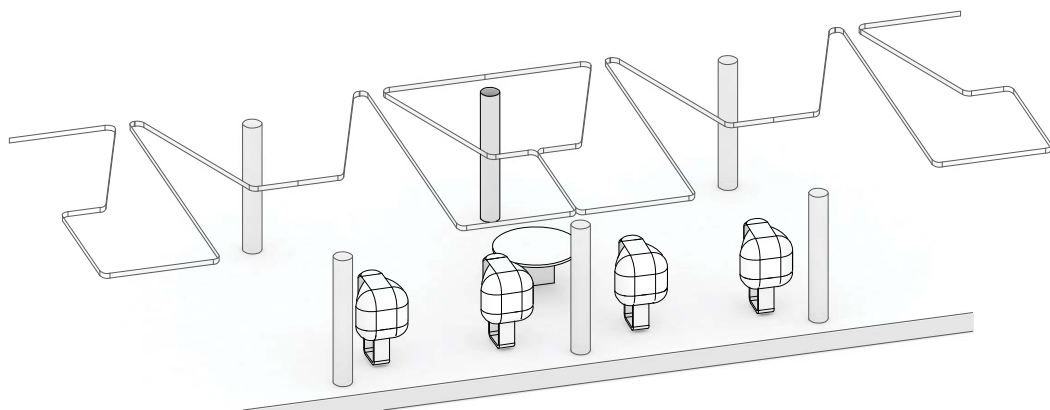
Case Study Curtain: Dwelling unit and its spatial performance
 a) unoccupied; b) guaranteed space; c) profiting from absent neighbours
 (illustration does not show curtains for better readability)



a



b

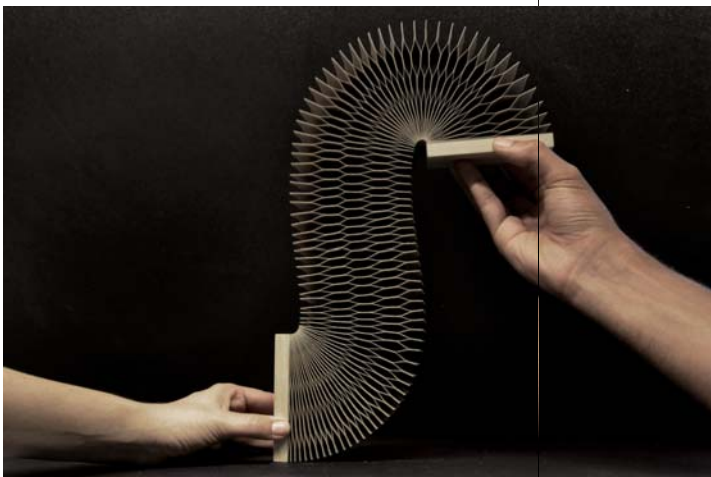


c

Case Study Curtain: Office unit and its spatial performance
 a) unoccupied; b) guaranteed space; c) profiting from absent neighbours
 (illustration does not show curtains for better readability)

the curtain gets thinner, the shorter the curtain is the thicker it gets. The height is constant. At a predefined distance, metal poles are positioned inside one of the many vertical chambers to give stability. At the bottom end of the poles are electromagnets that can fix the curtain to respective counterparts embedded in the floor. The curtains can only change position when the magnets are deactivated.

Placeholder



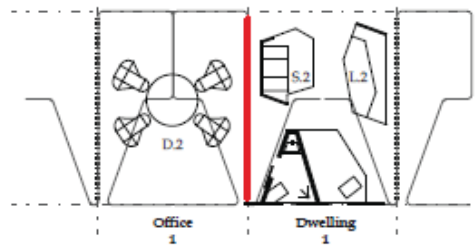
Case Study Curtain: Bellows style curtain in different configurations with different length and thickness

A.8.3 - CASE STUDY CURTAIN:

ORDER OF SUCCESSION OF MOVEMENTS

Change A: curtain moves from C1 to C2:

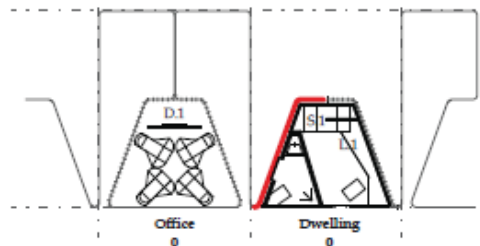
Curtain position C.2



- 1) DDDs (if in use and in benefitting mode) move into D.2 position (guaranteed space position) or they are already in this position
- 2) Curtain moves from C1 to C2
- 3) The dwelling's puzzle unfolds into positions L.2 and S.2 (guaranteed space configuration)

Change B: curtain moves from C2 to C3:

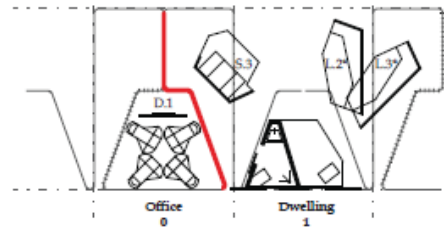
Curtain position C.1



- 1) DDDs move into D.1 position (unused space position)
- 2) Curtain moves from C2 to C3
- 3) The dwelling's dynamic furniture moves into positions L.3 (respectively S.3)

Change C: curtain moves from C3 to C2:

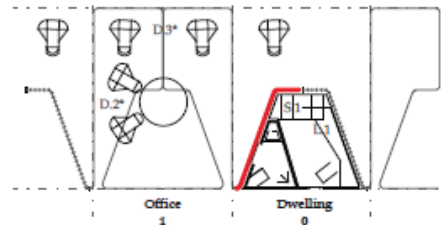
Curtain position C.3



- 1) The dwelling's dynamic furniture moves into positions L.2 (respectively S.2) (and re-establishes guaranteed space)
- 2) Curtain moves from C3 to C2
- 3) DDDs move into D.2 position (guaranteed space position).

Change D: curtain moves from C2 to C1:

Curtain position C.1



- 1) The dwelling's puzzle contracts into positions L.1 and S.1.
- 2) Curtain moves from C2 to C1
- 3) DDDs move from D.2 into D.3 position

The spatial changes always follow the rule: Dynamic element(s) move – curtain moves – dynamic element(s) of complementary use move.

