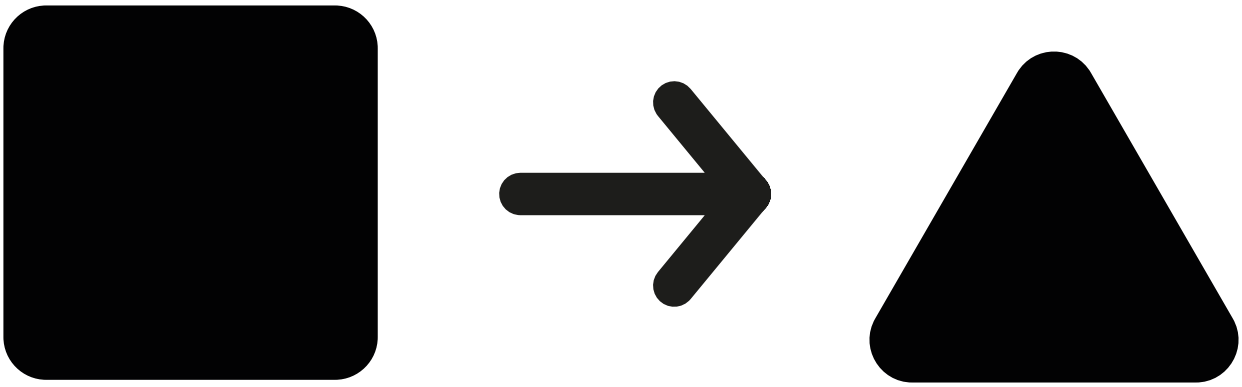
15 Minutes of



Raphael Cottier

Domus Academy, Master in Product Design
Final Thesis, February ‘20 Intake
Raphael Cottier

Envisioning Design Workshop

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Abstract

15 Minutes of is an attempt at answering what the future of the space in our homes will look like. We are currently in the transitional phase from one set of paradigms to another, from ownership to access, from centralization to decentralization. Many of the activities which are and will be decentralized will be done in the home, therefore expanding the life and time we spend in that space. Instead of having many more rooms for all the new activities, **15 Minutes of** lets you access whatever space you need to do whatever you want, for 15 minutes or more.

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1

Research

As is common with most projects the first step is to conduct research. Research into a certain topic, it's history and what has been created before and was is now. And for this specific workshop, as it is one of envisioning the future, what is especially important is was what is going to happen in the future. What are the trends that experts predict? What will certainly come true, what could be a possibility? And more importantly, how is it going to influence the way we live, we feel and relate to one another?

Knoll Workplace Research

Five Trends that Are Dramatically Changing Work and the Workplace

By Joe Aki Ouye, Ph.D.
Co-Founder and Partner
New Ways of Working, LLC

Knoll

Knoll Workplace Research, 2011

Knoll Research Division

The first piece of my research I would like to present is a very interesting report commissioned in 2011 by the Knoll Workplace Research division of the very well known furniture company Knoll. The report was done by Dr. Aoe Aki Ouye from the company New Ways of Working (New WoW), which is a community of experts devoted to researching and exploring the integration of organizations, technologies, and places for the new ways of working.

This report investigates the larger and more important trends of the future about the way we will be working. It mostly targets knowledge-workers or people with office jobs.

One overarching trend is that the rate of change in work and the workplace is increasing rapidly. The range of settings, geographies, and time frames where work is conducted becomes more and more broad. The report describes five major trends that we will see. The author then further explains five major implications that these trends will have for organizations.

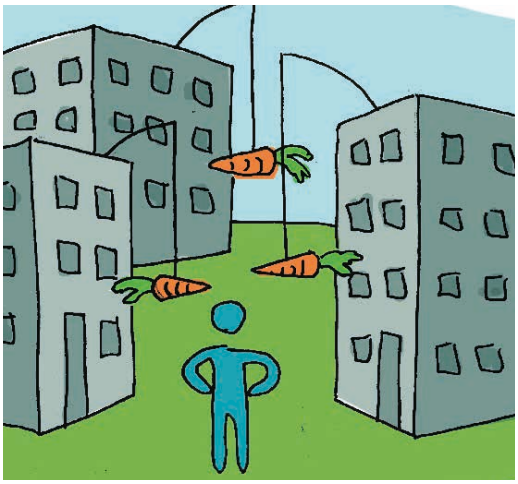
Decentralization

Flexibility, via Unsplash

The five Major Trends

1. The continuing distribution of organizations
2. The availability of enabling technologies and social collaboration tools
3. Coming shortage of knowledge workers due to retiring Baby Boomer generation and fewer younger workers to replace them
4. A greater demand for more work flexibility, not just when and where to work, but also the ability to define and tackle specific problems and tasks
5. Even greater pressure for more sustainable organizations and work styles. This will bring changes not only in regulations for companies but also changing the how, where, and when we work to further reduce greenhouse gas emissions across all major sources of greenhouse gases.

And the implications for the organizations are then the following.

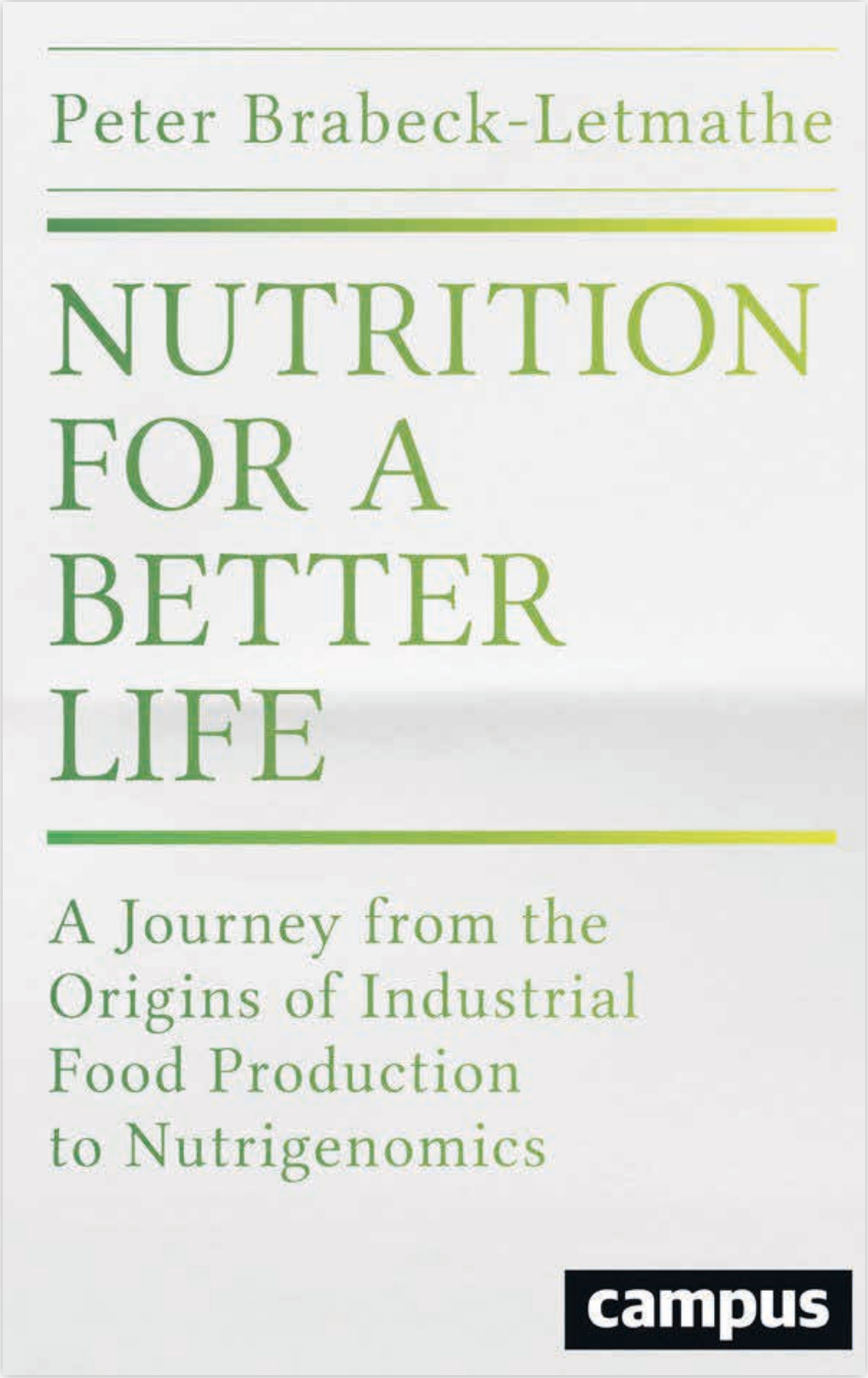


Worker Shortage, via Knoll Research

Environment, via Barilla

Five Implications for the Organizations

1. Centralized offices will evolve and prove greater variety of places to work, supporting collaboration and diversity of needs. At the same time, workers will increasingly work in distributed workplaces like satellite offices.
2. As workers are more physically dispersed, it will become more of a challenge to engage with one another. This does not only the case for work related collaborations but it will also affect socialization.
3. Probably the hardest part for most organizations will not be the change the physical aspects like workplaces or technologies, but that people will also have to change. The key here is to give employees a voice in the planning process and allowing them more liberty.
4. With a workforce going decentralized, workplace practices need to adapt as well.
5. The emergence of other alternative workplaces.



Brabeck-Letmathe, *Nutrition for a Better Life*, New York: Campus Verlag, 2016

Nutrition for a Better Life

Another interesting piece that was recommended to be me by our project leader as I was investigating the field of food, was the book Nutrition for a Better Life by former Nestlé-CEO Peter Brabeck-Letmathe.

It really changed my view on the food industry (for the better) by making me understand what its motives are and how they have changed over the course of history. How the food industry came about because it wanted to feed the people to improve their lives at a cost they could afford. It was not a question of how it tasted or how it was manufactured, as long as it provided nourishment.

Over the course of the decades new knowledge was gained by science and the food industry has changed accordingly. The food industry has always had a deep root in science, as the entire world view of it is based on it.

What has changed over the years, however, is that people do not just want to nourish themselves (we're going too good a job) but we want to nourish ourselves in a healthy way. And that is the way the food industry is going, according to Peter Braberk-Letmathe. This changed my view on the food industry, because I thought they only based themselves on outdated science and were only trying to employ tactics to make us eat more, a bit like what social media is doing to us these days.

Eating in 2030: trends and perspectives

Barilla Center FOR FOOD & NUTRITION

people, environment, science, economy

Barilla Center for Food & Nutrition, November 2012

Barilla Report

The last report I would like to present about food is from the well known food brand Barilla. It is a report about the future trends in the way we produce and consume food and how they will have taken shape in the year 2030. Having been publish in 2012, it was trying to look 18 years ahead, but even today the predictions made are a decade in the future, and therefore I believe we have not seen the end of the trends yet.

The most interesting part is where at the end, the report poses five questions, or oppositions, that it says we will have to solve in the future. I would like to point out a few relevant ones in the next pages.

Sense of Frenzy, via Barilla

Need for Conviviality, via Unsplash

Sense of Frenzy vs Need for Conviviality

The first opposition is one we are feeling in a pronounced manner today already. How will we reconcile the sense of frenzy that characterizes our current times with the need to return to conviviality? Especially since it seems the frenzy will only increase. The report argues that we will rediscover the true value of conviviality and that we will come up with new solutions for new spaces and times to dedicate to eating meals with others. On the other hand, and I believe this trend is already visible today, the focus will increase towards the eating-time interaction and communications with others, instead of cooking food.

Healthy Eating, via Barilla

Unhealthy Eating, via Unsplash

The Myth of Tasteless Healthy Foods

Today the myth that healthy food does not taste good or is not satisfying is still prevalent. But maybe not as strong as it used to be. I believe this is also because of new findings from science that actually shows us that the way our forefathers cooked (with all that tasty fat) was not actually that unhealthy as we were thought to believe previously. And in order to live a healthy life, we will definitely have to eradicate this myth once and for all.

Information Overload

Information Overload Management

The next issue is a hurdle that has been building up since decades, albeit here in the context of diet. The problem of information overload is a general one and not particular to diet, but it's also applicable here. Less in the sense that science has found out so much, but that due to the cheap connectivity to the Internet and man's general sense for exploration and experimentation, many people are sharing and comparing their results and experiments. From this many approaches have come up and many claim to be the most healthy way of eating. For the average person, this can either be a source of anxiety or awareness.

Tradition, via Barilla

Innovation & Scientific Discoveries

Tradition vs Innovation

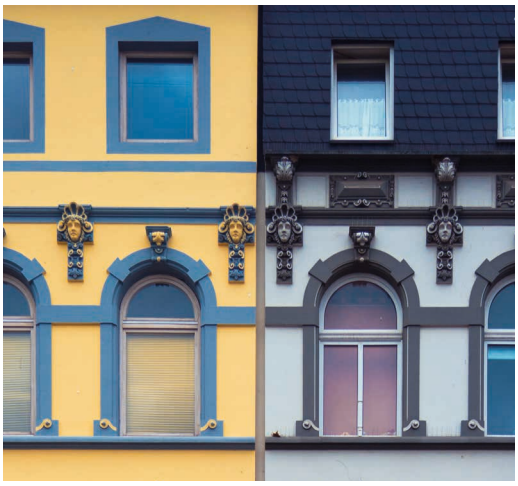
Currently there is a trend going back to more traditional and less technology influenced ways of preparing food and eating. One well known example out of Italy is the Slow-Food movement, but other examples that would also tie into the previous issue would be the Paleo diet and it's other extreme the Whole-Foods Plant-Based (WFPB) diet, each claiming to be the best way for the human to eat. The contrast to the trend to less refined and technology inspired food is the traditional food industry with it's highly processed food stuff.

Authenticity, via Barilla

Curiosity

Authenticity vs Curiosity

Similarly to the tension between wanting to uphold tradition and the need to innovate are the two needs for authenticity of food culture while having a craving for new experiences. How will we be able to reconcile those two opposing needs?



Individuality, via Unsplash

Environment, via Barilla

Individuality vs Sustainability

In modern times there is a high degree of individualism and push for it. However, often it is at the expense of the environment. At the same time, since 1960s we know that our climate is changing for the worse and that humanity plays an important role. The report says that we will have to figure out a balance between the two, or maybe new ways to individualize ourselves without being a burden to the environment.

Future Foods & Cooking Technologies

The next part is an overview of future technologies to grow food but also new kinds of foods (or rather, more widespread use of foods) and includes new ways of cooking. The overview will be done using case studies.

1. Overview of salad bar incl. hydroponic unit in the middle.
2. Hydroponic Unit
3. Micro-greens to be used as salad toppings

Hydroponic Farming: IKEA Space10 Pop-Up Hydroponic Farm

In 2017, IKEA's innovation lab Space10 has presented a pop-up farm during London's Design Festival where tiny green were grown to prepare 2'000 salads. The hydroponic farm was built using a wooden structure of approximately two square meters and had space for three levels of crops. It incorporates smart technology by hooking up the plants up to Google's voice-controlled home device. This way farmers can talk to the plants and find out about the nutrition levels. A salad bar was set up in front of the pop-up farm to serve the food directly.

The micro-greens that are grown inside the hydroponic setup can typically be harvested within 14 days of germination and can be used as salad toppings. The short time between harvest and consumption highly increases the nutritional content of the greens, as it quickly diminishes as time passes, which can be in the range of days when bought in supermarkets.

1. *BioBombola*, ecoLogicStudio, 2020

Micro-Algae: BioBombola & The Coral

The next food I would like to present are micro-algae. Algae can be used for food to fuels. They have been consumed by humans for a long time already, one of the better known examples being Japan and Africa. However, these two case-studies utilize smaller species of algae like the blue-green micro-algae Spirulina. These kinds of algae can be considered superfoods due to their high amounts of proteins, vitamins, minerals and antioxidants. The two case studies give the rather technical home-growing of algae a more human dimension.

1. *The Coral,* Hyunseok An, 2019

BioBombola was developed by the architecture and research practice EcoLogicStudio during the current coronavirus pandemic. It is a minimal kit for growing and harvesting fresh Spirulina. The gentle bubbling that is produced from the rising air through the large tube produces very calming sounds. Also one tube of algae produces as much oxygen as seven indoor plants.

The Coral was developed by the designer Hyunseok An as part of his graduate project at Rhode Island School of Design in 2019. It was conceived as a mural sculpture that changes color based on the maturity of the algae in each cell. Its aim is to encourage people to use algae as a more sustainable component of a nutritional diet. The 14 wall modules enable daily harvest of the recommended amount for one person every day.

1. *Hive*, Katharina Unger & Livin Farms, 2015

Insects: Hive

Insects have also been consumed by certain cultures for many centuries already. What produces a sense of nausea for some make others salivate. The reason why insects are considered a food source of the future is due to their high protein content compared to the low resource usage for their farming. Some of the more popular insects for growing are mealworms and crickets.

Katharina Unger has created the counter-top appliance Hive to grow mealworms. The appliance was launched and successfully funded on Kickstarter. It is a fully autonomous unit to which you only need to feed food scraps.

The Future of Food Preparation: Molecular Gastronomy & 3D Printing

In terms of food preparation there are also some exciting trends. The first interesting area of interest in food preparation is molecular gastronomy. Using techniques from this field it possible to deconstruct and reassemble foods into stunning creations. For instance, world renowned Spanish chef Ferran Adrià of the elBulli restaurant created tagliatelle made from saffron flavored broth. Or the sponge cakes that look like moss or even edible green foams. The last example uses the previously covered micro-algae Spirulina which has been transformed by Space10 into a chip as part of the 2013 CHART Art Fair in Copenhagen.

1. *Saffron Tagliatelle of Consommé*, via molecularrecipes.com
2. Moss Sponge Cake, via vanillietanz.de
3. Edible Foam, via kidsquestmuseum.org
4. Spirulina Chips, via space10.com

1. *Cornucopia*, MIT, 2010
2. Geometric Cake, Natalia Shmatkova using Dinara Kasko's 3D printed molds
3. Plate at Food Inc pup-up restaurant
4. 3D Printed Candy, SugarLab

The other very interesting technology in food preparation is the now very popular 3D printing technique used for rapid prototyping. Already in 2010 two graduate students from the MIT Media Lab have conceived a concept to print meals. The lower left image is from the Food Ink restaurant which takes up 3D printing to a whole new level. Everything when visiting the restaurant is 3D printed, the cutlery, the seats, tables, etc. but also the food. In this specific image the center liquid-holding piece has been 3D printed and is edible. The last image is 3D printed sugar. In this case 3D printing mainly is used as a new way to shaped food.

The first interesting case study that uses molecular gastronomy and combines it with traditional technology is justaddwater by Defne Koz and Marco Susani (a Domus Academy alumni) from 2014. justaddwater is a set of appliance connected to an app that helps in the creation of healthy and tasteful meals. Being connected to your smartphone it has access to all your activities and other measured body stats but also to all other information from your other connected devices like the content of your fridge. It combines fresh food, supporting local farming and ensuring the best quality ingredients, with so called flavor pills that contain only a tiny amount of food and are packed using technique from molecular gastronomy. Shipping of the flavor pills has a small carbon footprint and ensure a perfectly dose to prepare perfect and balanced recipes.

1. *justaddwater*, Defne Koz + Marco Susani, 2014

1. *Food Creation,* Philips Design, 2009

The second interesting case study is by Philips Design. The conceptual product Food Creation is part of a set of projects that takes an unconventional look at areas that could have a profound effect on the way we eat and source our foods in the future. Food Creation has been inspired by molecular gastronomy and deconstructs its ingredients to the reassemble it in completely different ways and in this case, using 3D printers.

A Look Into the Future Through the Meatball

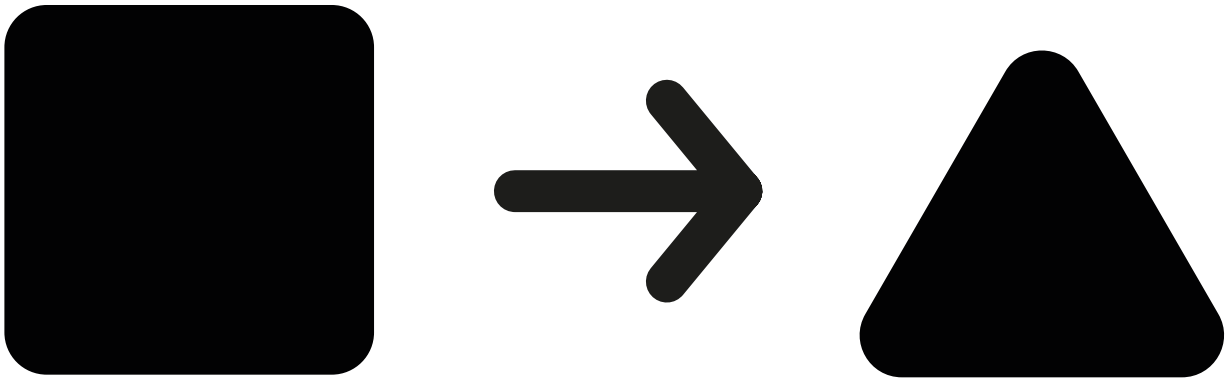
The next spread shows an exceptionally well done visual exploration of future foods and food preparations in the next 20 years (or 15 years, as it was done in 2015). It was done by IKEA's research and design lab Space10. The visual exploration uses meatballs as a canvas to explore the complicated research in a simple, fun and familiar way. Meatball was chosen because it is present in many cultures and cuisines, such as Sweden, Italian-American cuisine, or the Lebanese Kofta.

Some notes about the balls: The Nutty Ball is composed of new varieties of grains, legumes, and nuts. The Lean Green Algae Ball is composed of aquatic plants and not only algae. The Urban Farmer's Ball is composed of fresh produce from local farms, adhering to the Zero-Mile principle. The Mighty Powder Ball is made out of nutrient-rich substances. The proteins used for The 3D Printed Ball could come from algae but also beet leaves or insects.

1. The Lean Green Algae Ball
2. The Nutty Ball
3. The Urban Farmer's Ball
4. The Crispy Bug Ball

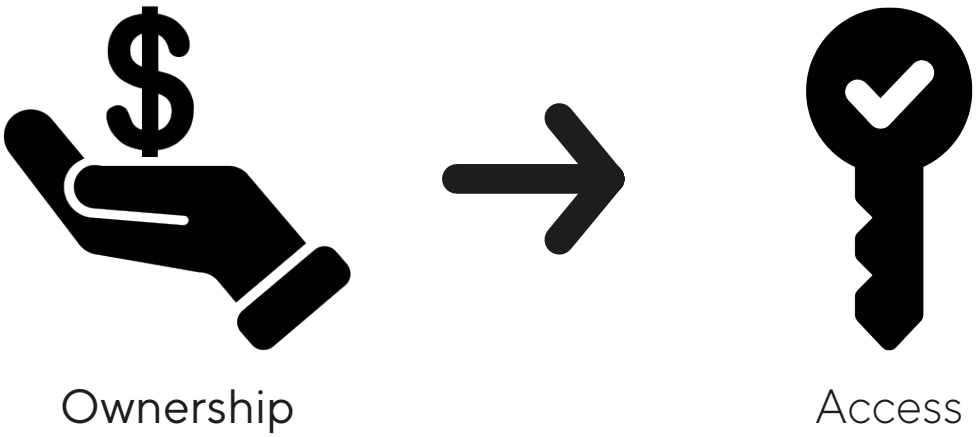
5. The Mighty Powder Ball
6. The Wonderful Waste Ball
7. The 3D Printed Ball
8. TheArtificialMeatBall

2



Paradigm Shifts I

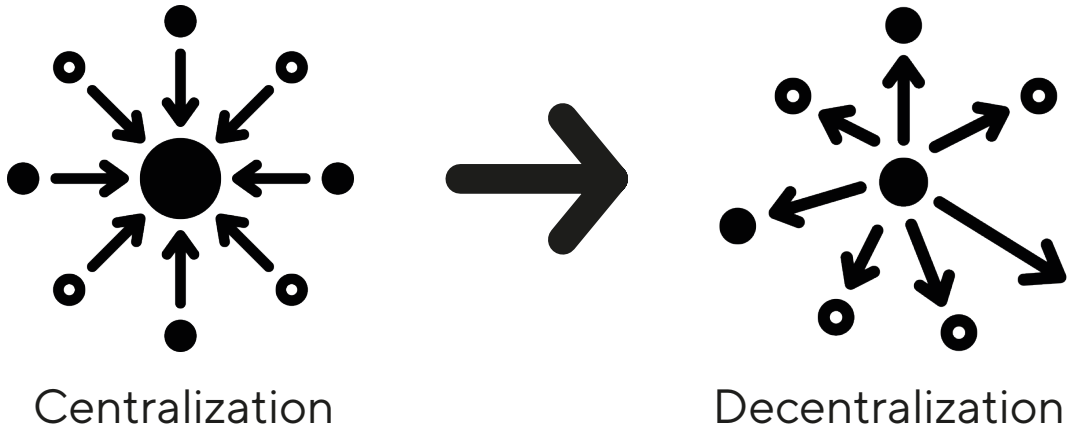
For this workshop, next to the research on a domestic topic, additional literature was recommended to us. Amongst others were the works on the new paradigms of the sharing economy or the age of access. Also during my research I stumbled upon those topics, especially in relation to 3D printing. The author Jeremy Rifkin has said that we are in a transitional period between paradigms, and I noticed it wasn't just one but several at the same time.



Ownership, Eliricon via the Noun Project

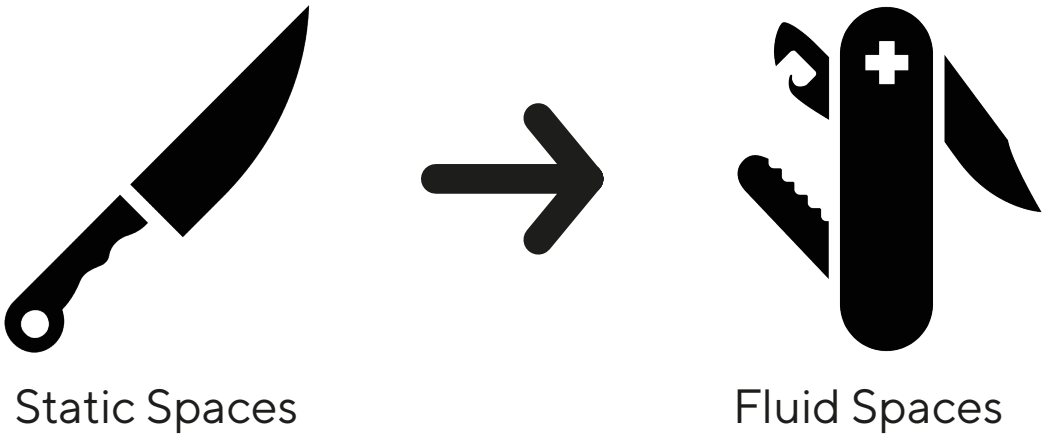
Access, Alice Design via the Noun Project

The first and most known paradigm shift occurs from the sense of ownership to a sense of access to stuff. This has been ongoing for some time now and has shaken up many industries. The most obvious examples are streaming services such as Netflix or Spotify but it has also disrupted the vacation homes (AirBnB), taxi services (Uber, Lyft), car ownership (Blablacar, car sharing), and many more. More recently this shift is also happening in the software industry with the most notable early adopter being Adobe with their Creative Cloud membership.



Centralization & Decentralization, priyanka via the Noun Project

The second shift is most noticeable in the production of things such as energy and goods. Better known examples of this shift are 3D printing and rapid prototyping in general and solar panels. With 3D printing people can manufacture their goods at home, whereas now most goods are produced in centralized locations, a.k.a. factories. Similarly with solar panels; the traditional energy production happens in centralized facilities like power plants but with solar panels, every house can become their own producers. Another example that is less obvious is online shopping: we buy goods from our own home, we don't go to physical and central locations. The same will happen with our food production to some degree using hydroponics and aquaponics. People will be able to grow some foods in their own homes.



Static Spaces, Vectors Market via the Noun Project

Fluid Spaces, by jc via the Noun Project

The last shift is more of a consequence of the first two. As many activities that happened outside of the home start to migrate inside the home, the spaces have to cater to a much greater variety of activities, our home life becomes multi-dimensional. Currently the way we think about spaces is very static. They may be multi-functional like a living room, but those activities don't change. With the current pandemic this problem has been forced into the awareness of many, as they were trying to work, workout, shop, relax, produce, eat, cook, sleep, socialize inside of their homes. If we were to continue using our static definitions of spaces our homes would have to become bigger in the future. However, it is predicted that space will become even more of a scarce resource in the future as even more people will move into cities. That is why we have to shift our way of thinking from a static space definition to a fluid one.

This is where my concept ties into.

3

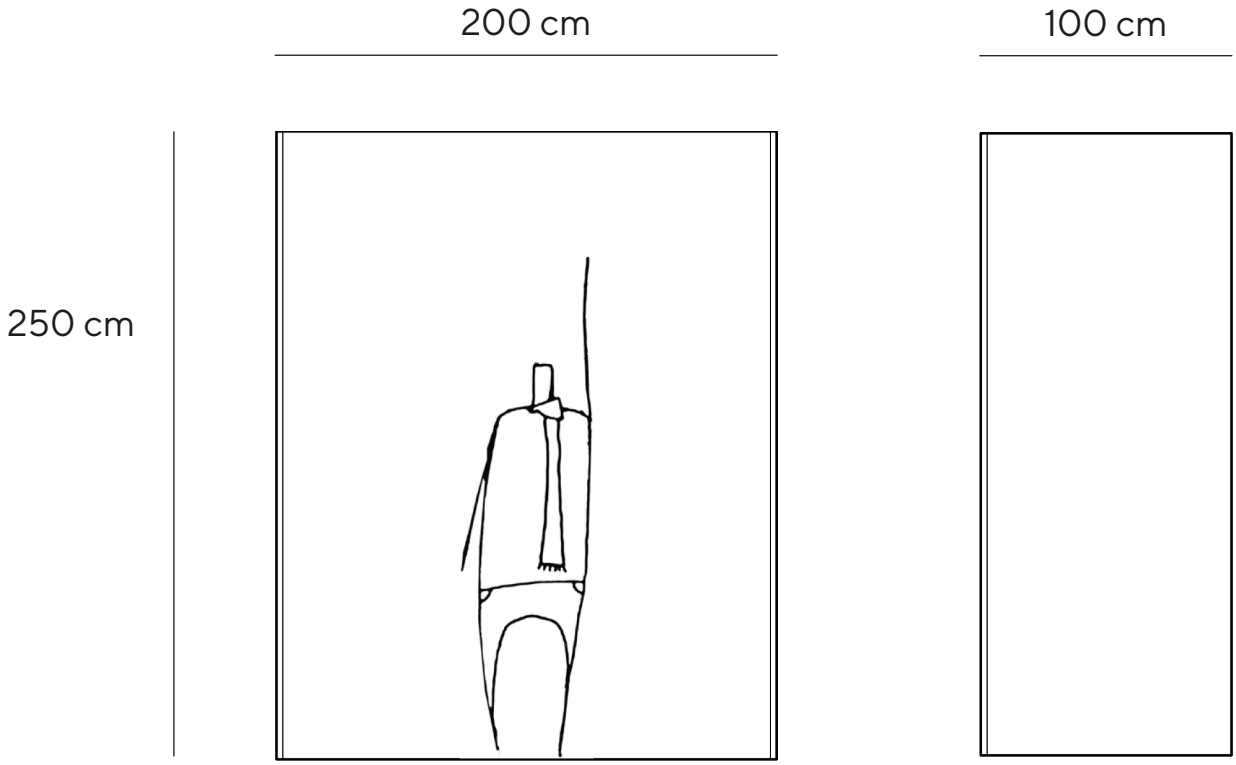
The Fluid Space

or

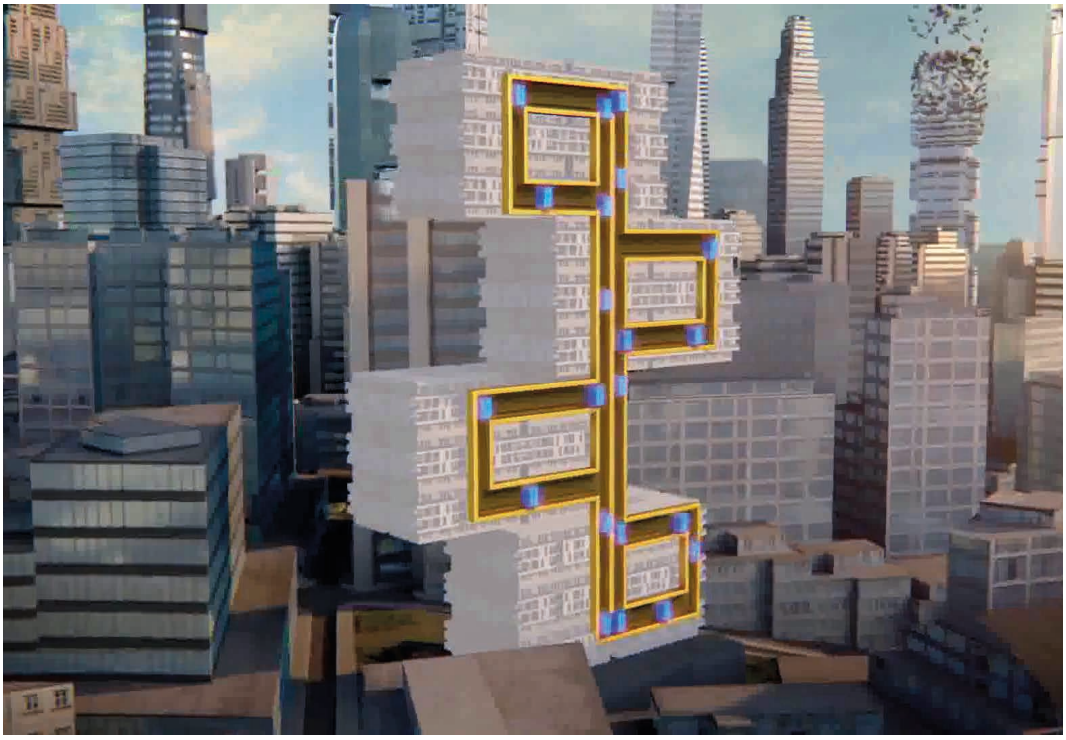
15 Minutes of Luxury

A space that is **not bound to a specific function** but that can be **redefined by the resident** whenever needed, for whatever activity.

Therefore it is a space that **adapts to its residents**, unlike today, and is therefore **not static in its definition**.



Multi, ThyssenKrupp, 2017

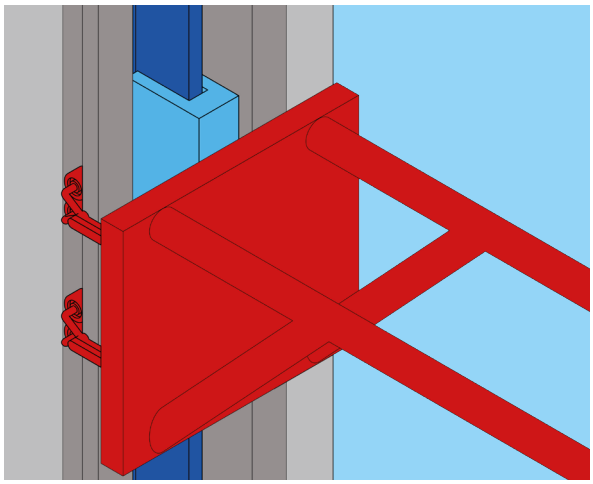


Base Unit & Technology

The way I have implemented my concept is very simple. You take one empty wall in an apartment and make it so that it can adapt to whatever activity you wish. The way it's done here is by attaching modules to the apartment at the empty wall. The base module is 200 centimeters wide, 250 centimeters high, and 100 centimeters deep. This allows for a multitude of activities while not being too big.

Already today we have tall houses with multiple floors and many more apartments and in the future we will have even more tall and super-tall buildings. To be able to bring the modules to the apartment we could use the elevator-technology innovation by ThyssenKrupp from 2017 called Multi. It is a new kind of elevator which only can have multiple carriages per shaft, but also can go sideways! The main propulsion system is based on a magnetic linear drive which is basically a rolled out electric motor.

Base structure to lift up modules.



Sledge

Concrete Structure

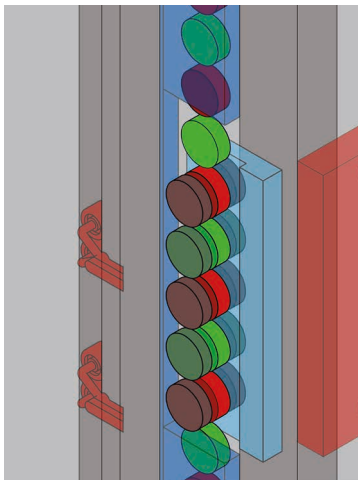
Guiding Rails

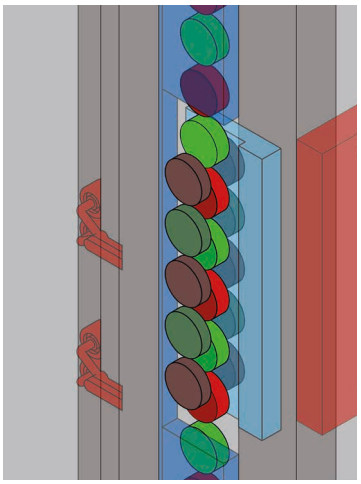
Linear Drive Motor

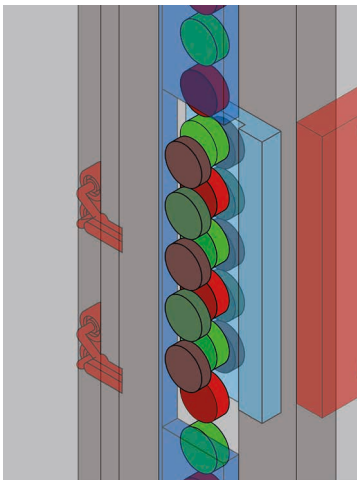
Electromagnets

Permanent Magnets

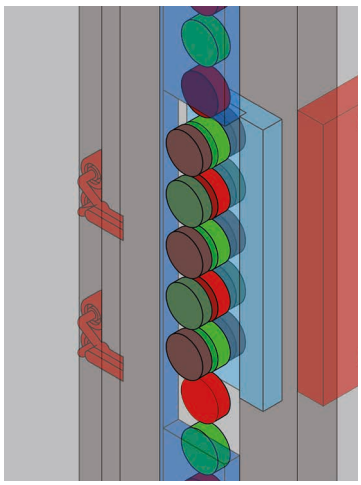
Steps 1-3

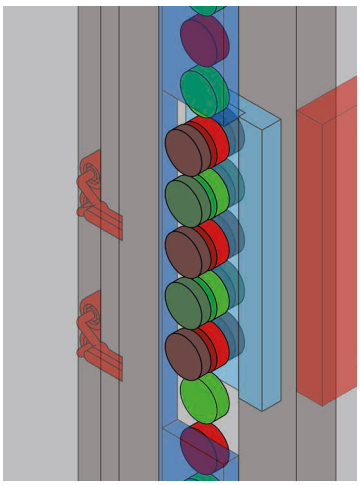


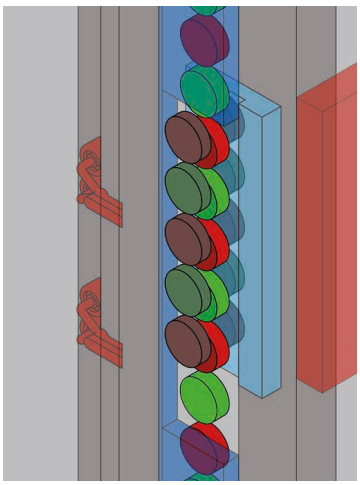




Steps 4-6







Magnetic Linear Motor Drive Explained

A linear magnetic motor functions on the same principle as an electric motor. Let's assume the base structure on which the modules would be brought up to the apartments is composed of a concrete support structure that lines the entire building. On this support structure guiding rails (shades of gray) are affixed. On these guiding rails a sledge moves along using the motor and small guiding-wheels.

The motor unit is made of two parts (two shades of blue), a long rail that is along the entire concrete structure (dark blue) that is filled with so called electromagnets (bright green and red). The outer lip around this rail that is attached to the sledge (bright blue attached to the red sledge) houses the permanent magnets (dark green and red) that are pulled upwards which in turn pull the sledge with the module up.

This upward motion is achieved by alternating the polarity of the electromagnets. As their name suggests electromagnets aren't magnetic unless an electric voltage is applied. The polarity of the electromagnets can be reversed by reversing the applied voltage. Assuming the state in Step 1, the magnets in the lip and rail generate an opposing force because the same polarities are lined up. At the same time a pulling force is active to the neighboring magnets due to their opposed polarity. Because both forces point in the same direction, the sledge will start to move as in Steps 2 and 3 until the sledge is in a state like in Step 4 where the magnets' polarities oppose each other on the same line. To continue the motion, the voltage on the electromagnets is reversed, which in turn changes their polarity as in Step 5 and we repeat the same Steps 1 through 4, the beginning of which is shown in Step 6.

Possible Modules

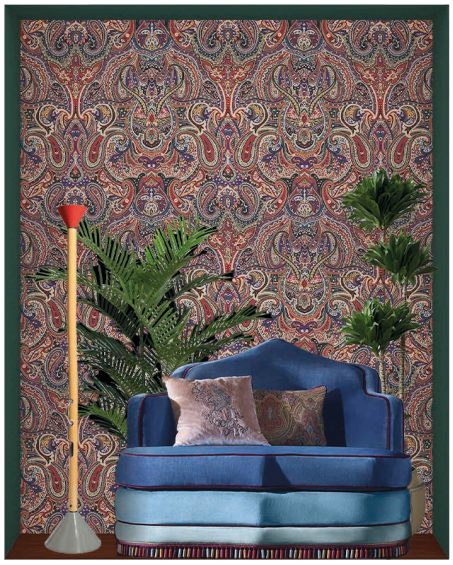
Home Office

As we have determined in the research we will be working in many different ways in the future. We won't necessarily have a central office to commute to every day. Instead we will be able to determine where and when to work on our own. One day at the satellite office that is only a short walk away and another we may spend at home for the peace and quiet. Or we want need to work on some short personal project.

Murphy Bed

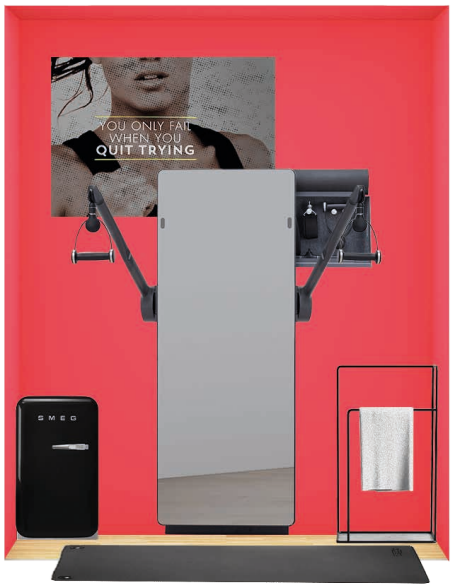
An additional bed that is stored within a closet that is pulled down to extend the bed horizontally. This could be useful for when guests would like to sleep over.

Relaxing in Luxury



This module combines two functions. The functional one is to have a comfortable sofa with a beautiful surrounding for you to relax and maybe read in. At the same time it depicts the democratization of expensive designer furniture to the masses. Each furniture piece is expensive many would not buy it but would still want to experience it once in a while. Using the rental model one can have access to luxury goods without having to pay to own them and only use them briefly during the day.

Home Gym



Similarly to the Home Office module, the Home Gym module caters to a common need. Many people might not want to go to a gym or just simply don't have one in close proximity.
The combination of the Home Office, Relaxing in Luxury, and Home Gym modules demonstrate the power of the concept very well. During the day one rents the Home Office module to work, after work one rents the Home Gym module to their regular workout and after a refreshing shower, one can relax in the Relaxing in Luxury module. All of his has happened in the same four walls in just one room.

Restaurant

Lastly, the restaurant module, especially in the way I have rendered it using the MacDonald's brand, could be any restaurant or food & beverage establishment you like, from the small single franchise restaurant to large chains as MacDonald's. The waitress behind the counter would obviously not be human, but rather a robot or the module would not even have a human-like figure at all.

Alcove

The Alcove Module is inspired the Japanese tokonoma, a recessed space in a Japanese-style reception room, where items are displayed for artistic appreciation. In a similar vein, this Alcove Module could be pre-designed to bring more mindfulness into peoples days. Or it could come pre-configured as a religious alter, be it Christian, Buddhist, or Muslim. I think this module is also very important because of the increased sense of frenzy we experience and which will probably not stop as has been presented in the research part in the Barilla report.

4

The Fluid Furniture

After applying the concept of fluidity onto a larger scale field such as interiors I tried to apply it onto objects of a smaller scale. The first step was to adapt the concept onto the field of furniture which gives the text below. Similarly to the previous concept, when applied to a smaller scale modules are still used. They are however, much smaller and could be brought via automated drones and other vehicles. Their functions are obviously also very different, but they can be helpful to achieve similar goals.

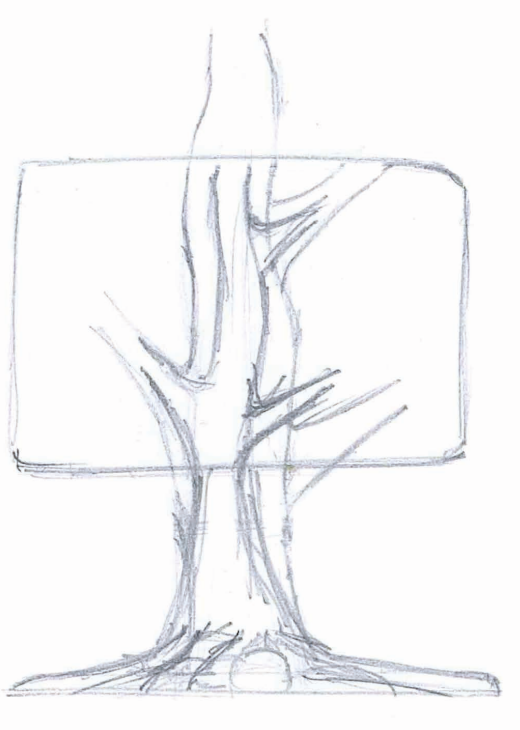
A piece of furniture that is **not bound to a set of functions**, but that can be **redefined and repurposed** whenever needed, for whatever activity.

Therefore it is an object that **adapts to its users**, unlike most objects today, and is therefore **not static in its functions**.

Inspiration & Implementation

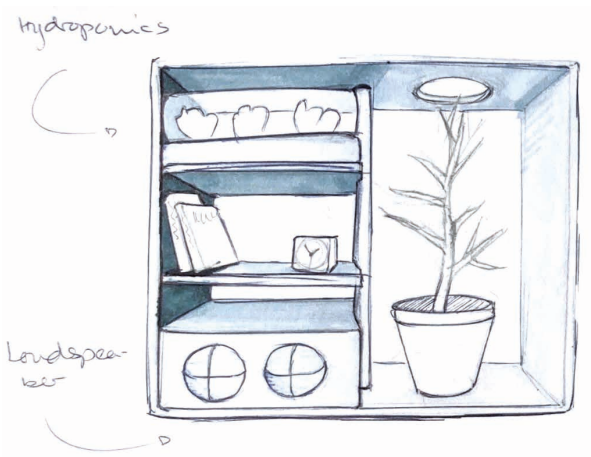
Andrea Branzi's work has been very inspiring for the formal aspect of the application of the concept onto furniture. Especially his work Amnesie from 1989, with it's poetic relationship between nature and industry. Another inspirational work, this time for the functional aspect, was his more recent work Sandolino from 2012, where Branzi combines the basic necessities of life into a compact shelving system.

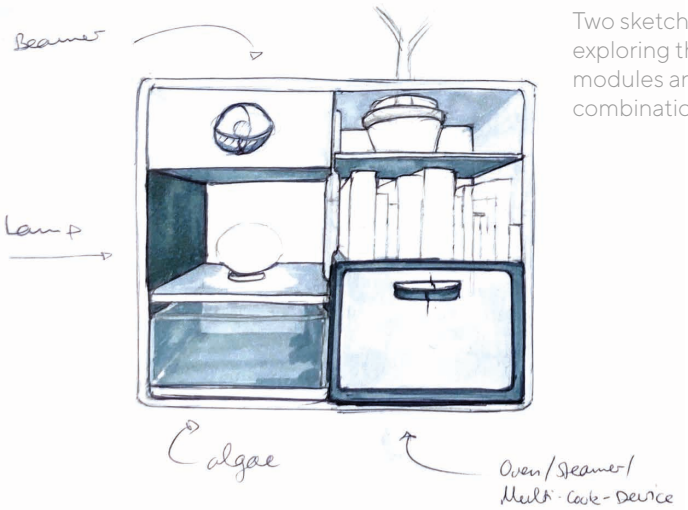
Sandolino, Andrea Branzi, 2012



left: Sketch of the module's support framework

right: *Amnesie,* Andrea Branzi, 1989





Two sketches exploring the possible modules and their combinations.

Empty framework safe a shelf for the plant to sit on and a bird for decoration.

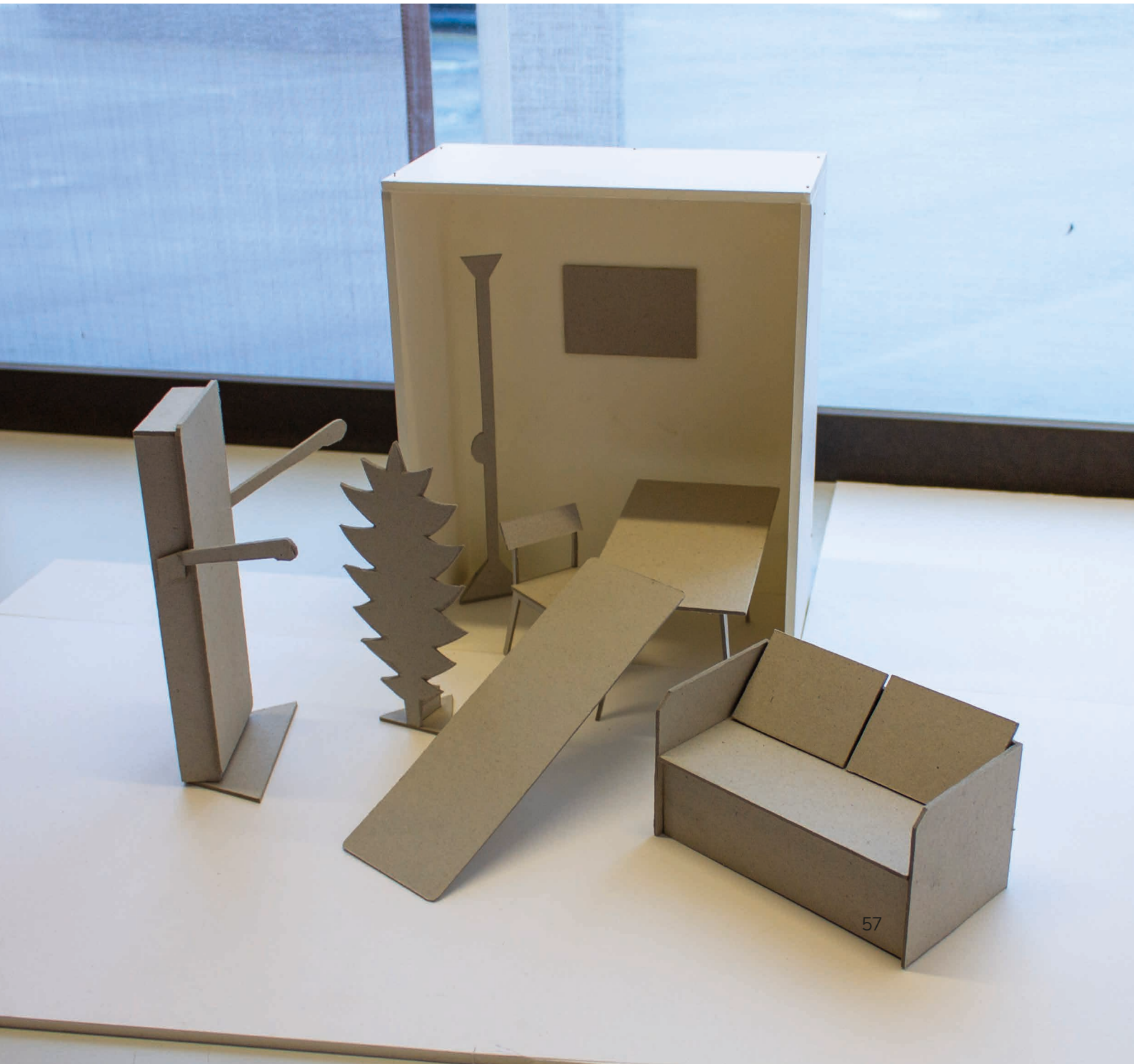
The framework has been equipped with an additional loudspeaker module and a hydroponic module at the bottom. Some books were added in the empty space in between modules.

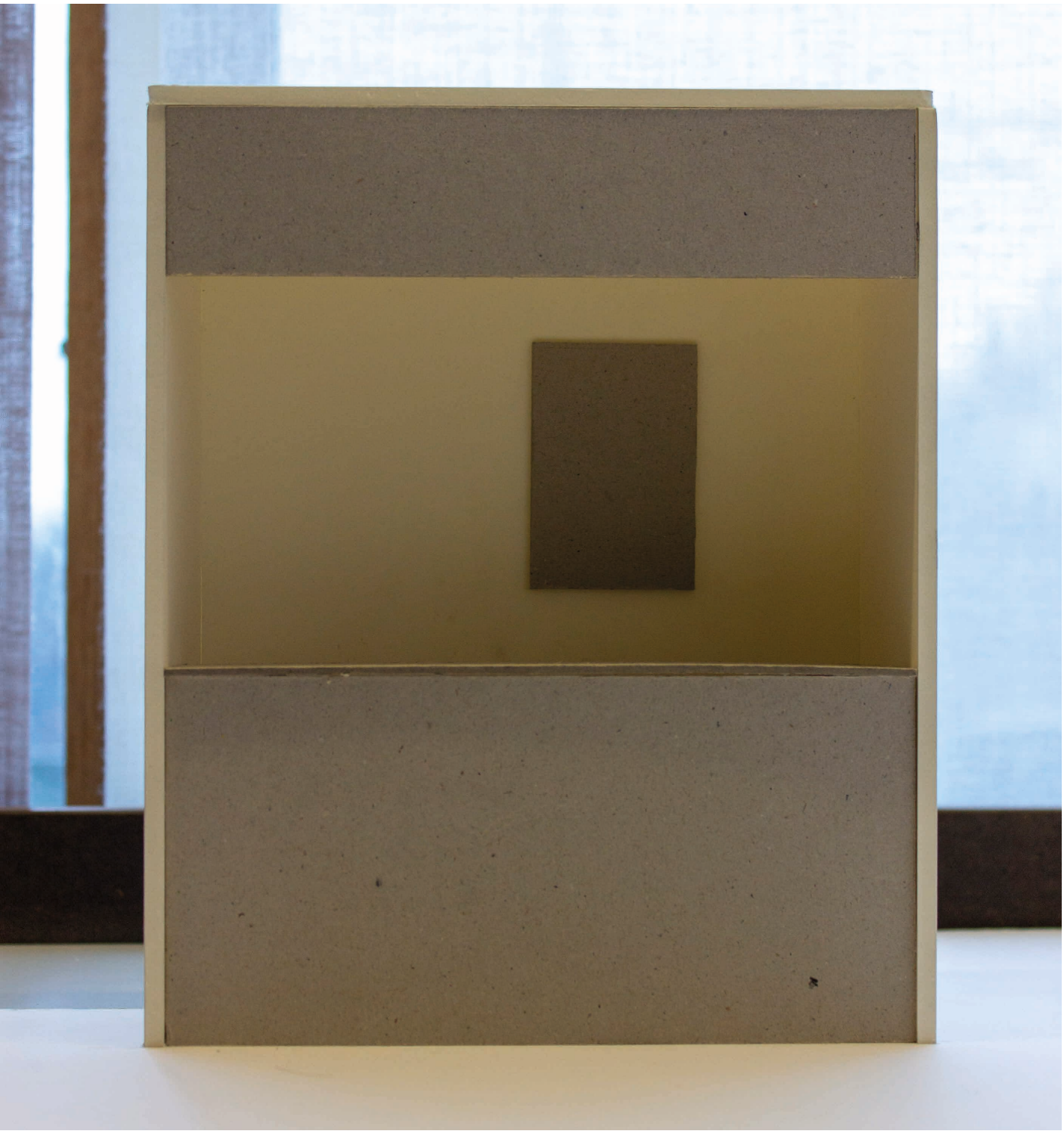
In addition to the hydroponic module, an additional algae module was added, increasing the capacity of food production of the combination.

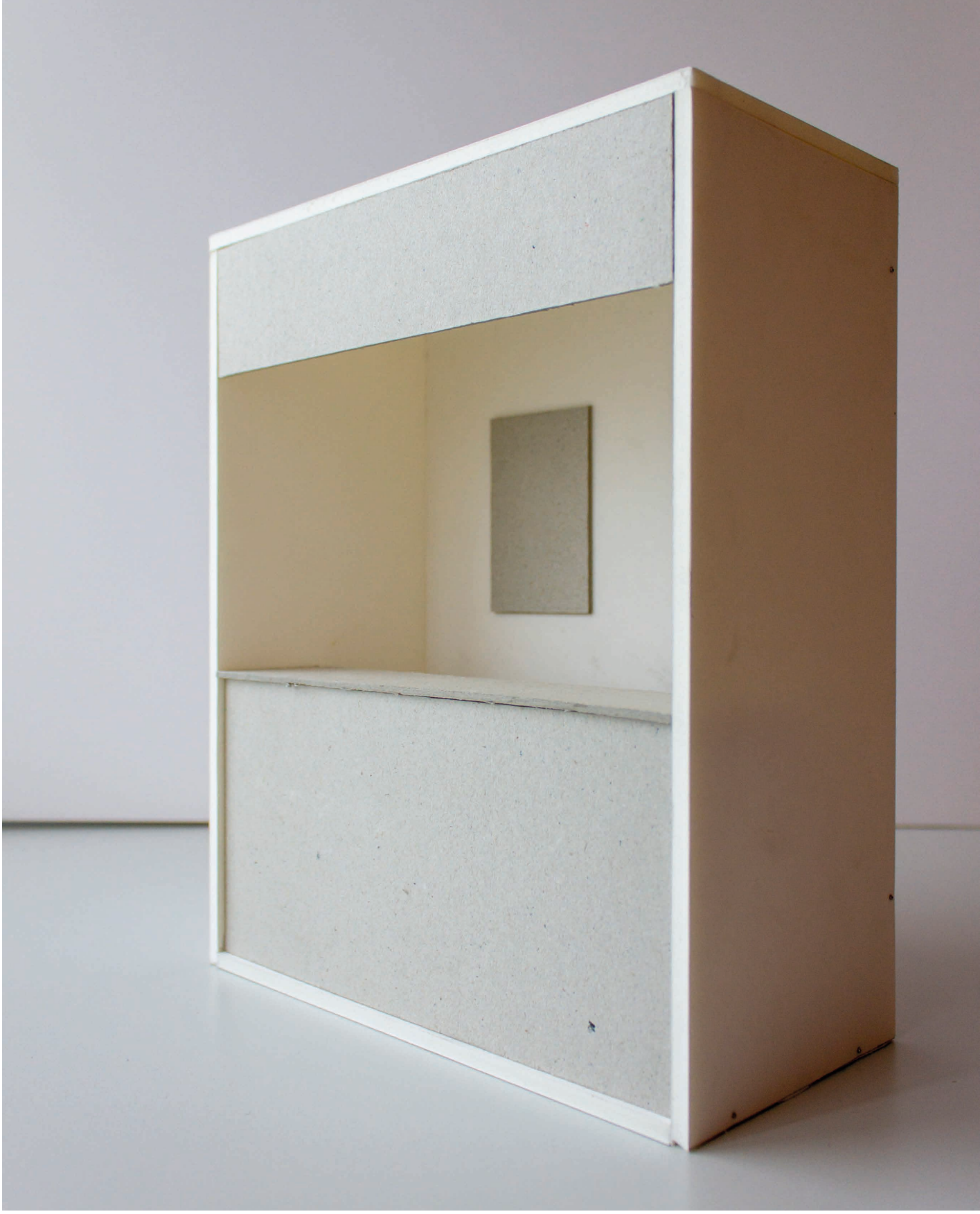
The modules do not necessarily need to have a productive function as is the case here with the aquarium module. They can also be purely decorative or entertaining.

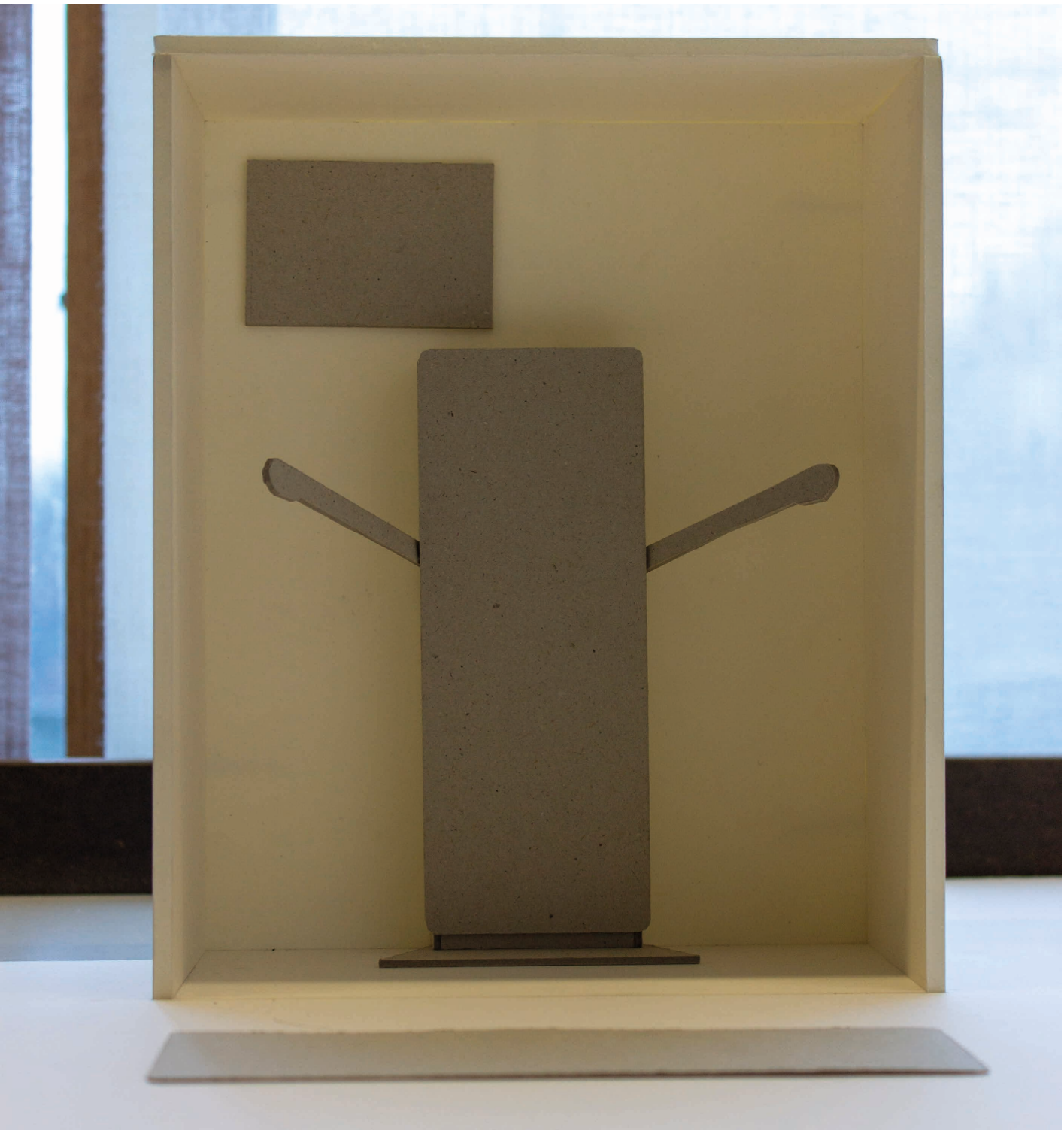
5

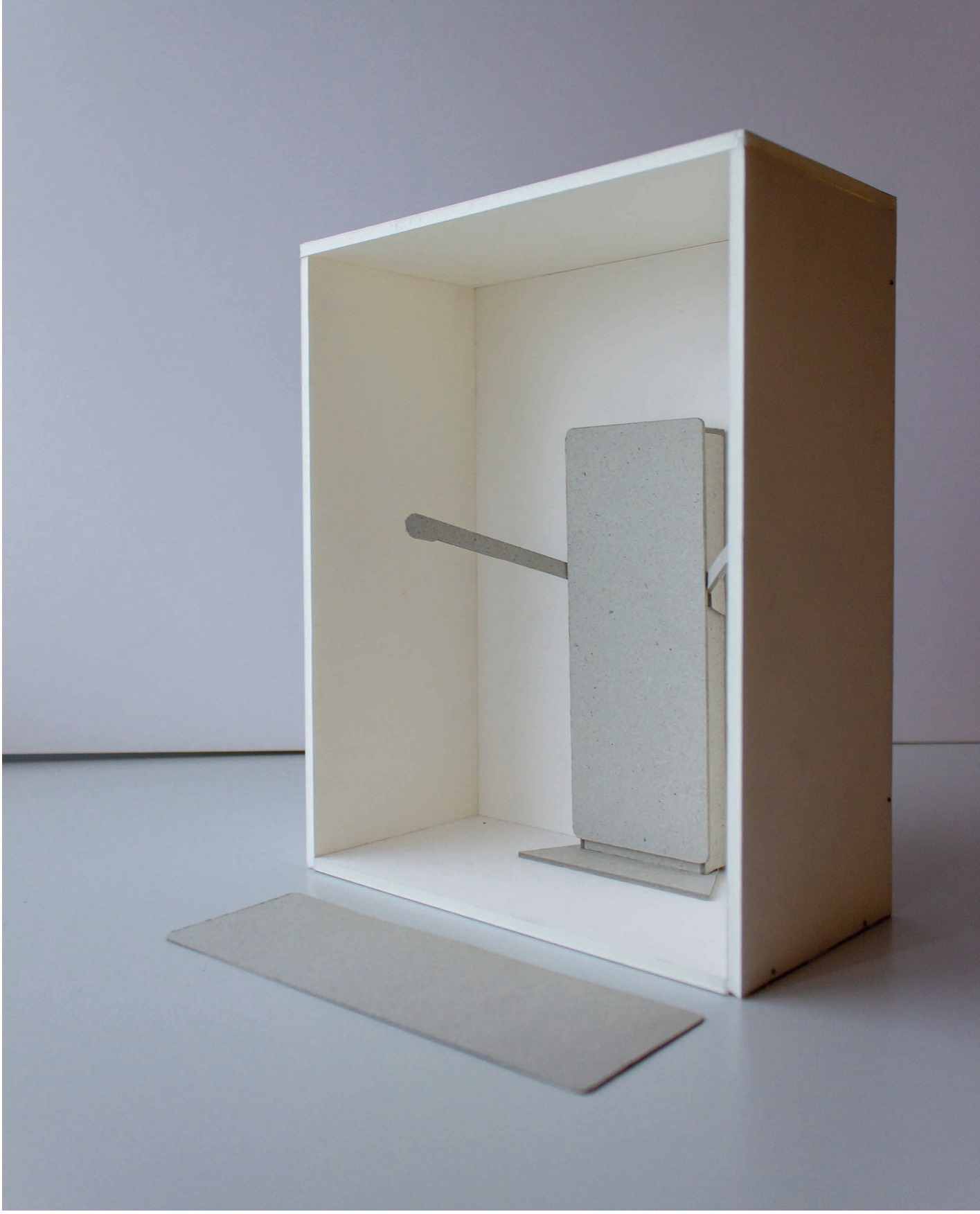
Physical Models I







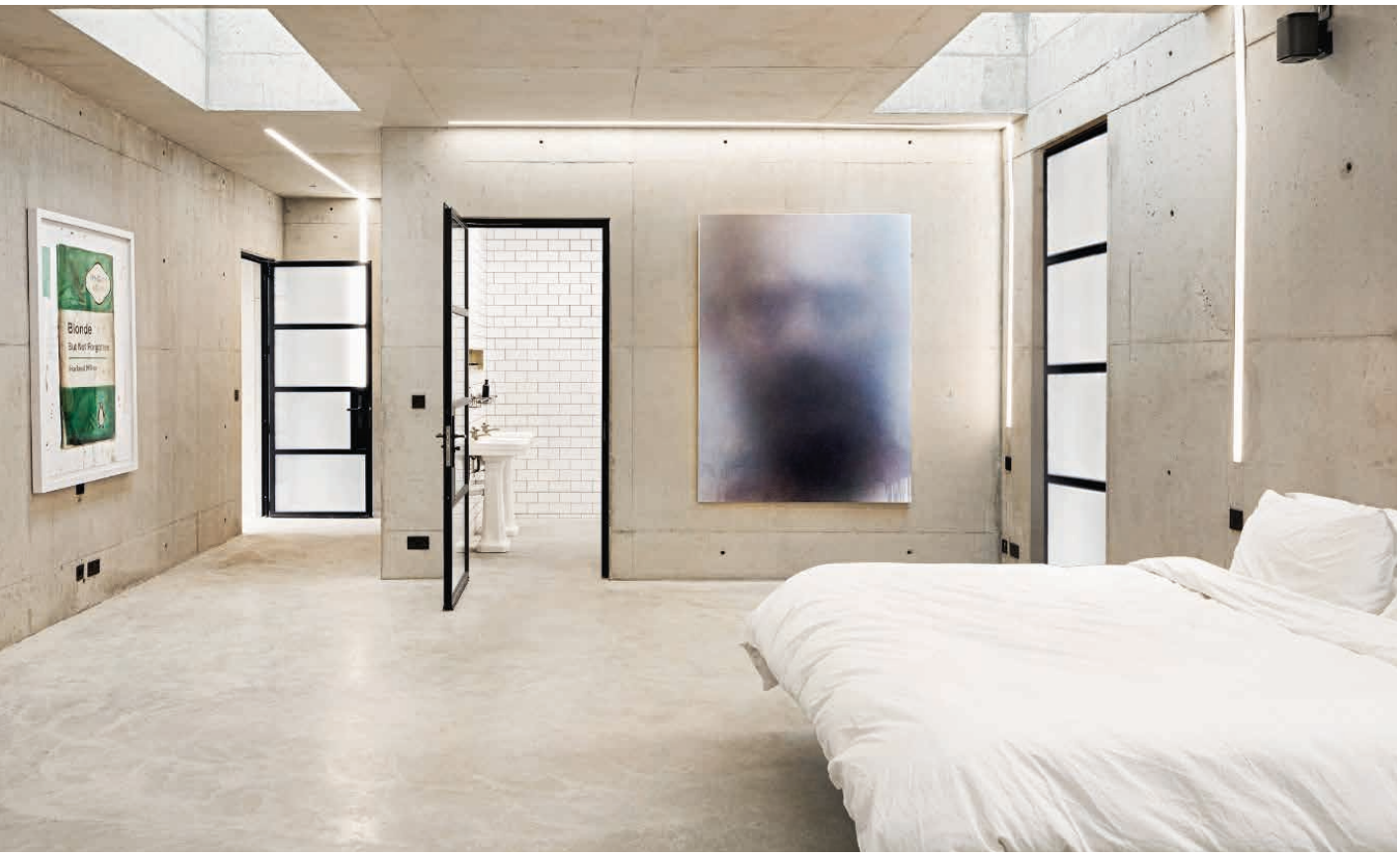




6

Photocollages

Following are some photocollages of what a module could like when attached to a wall in an apartment. First the apartment is shown without a module but with the module doors closed.


Blonde

Blonde

Blonde

Elliott Erwitt Shots
UNRAUS

Elliott Erwitt Shots
UNRAUS

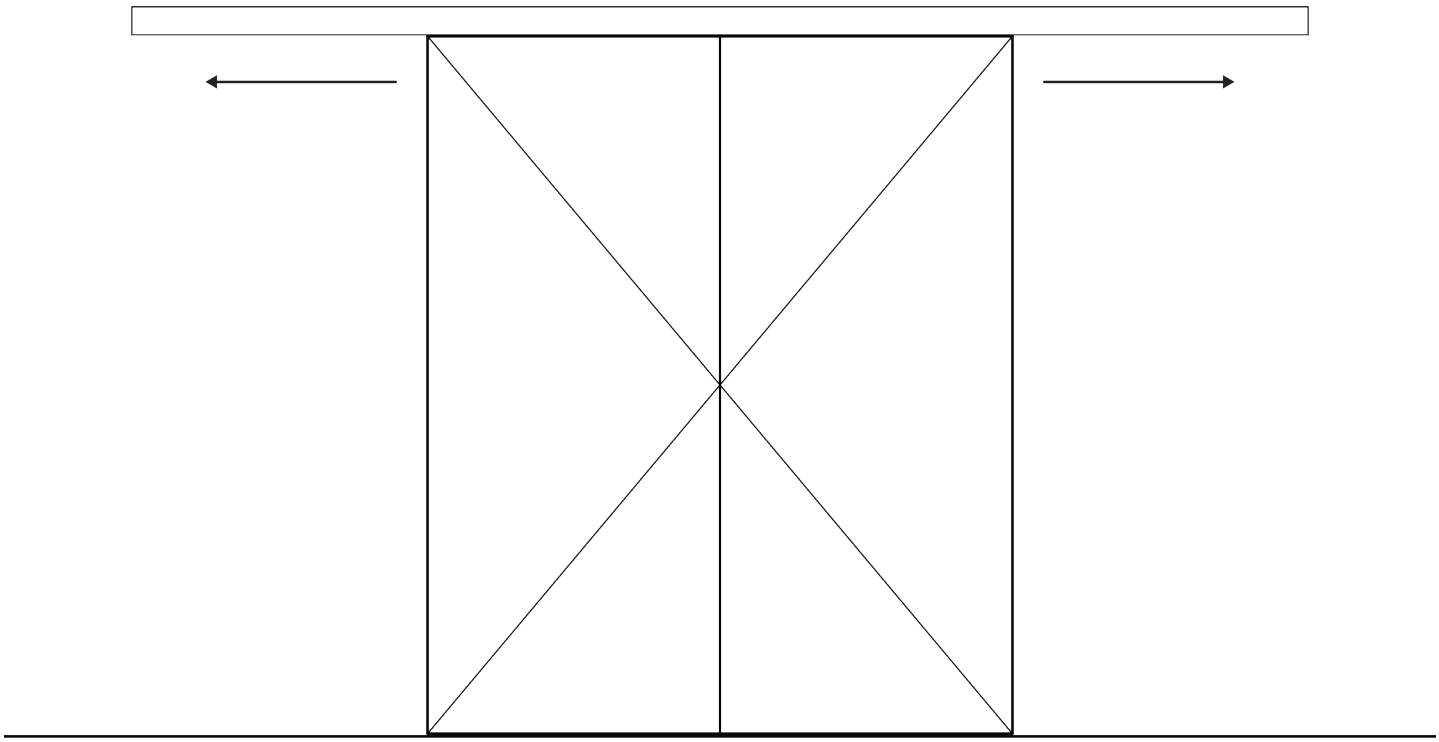
Elliott Erwitt Shifting
UNAUS

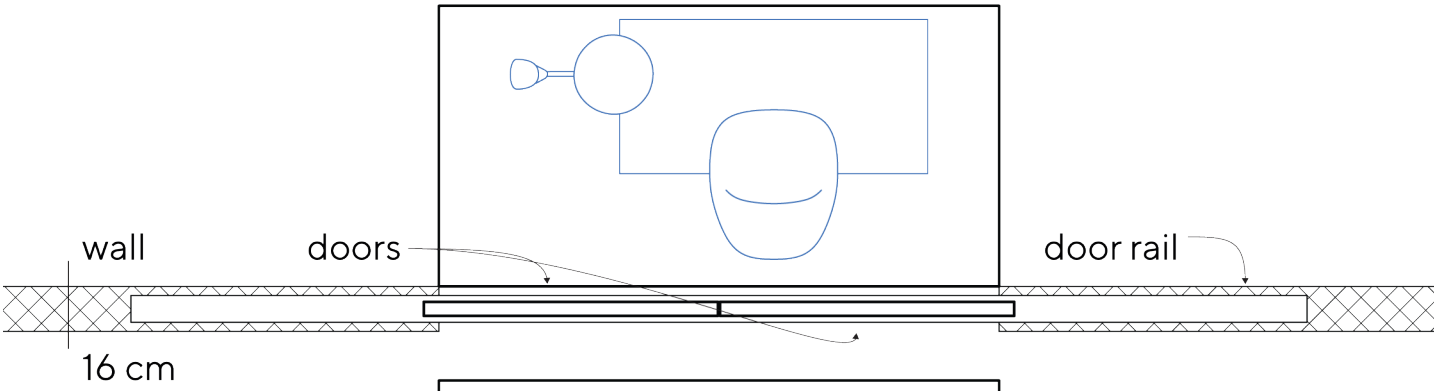
McDonald's
Elliott Erwitt Shifting
UNAUS

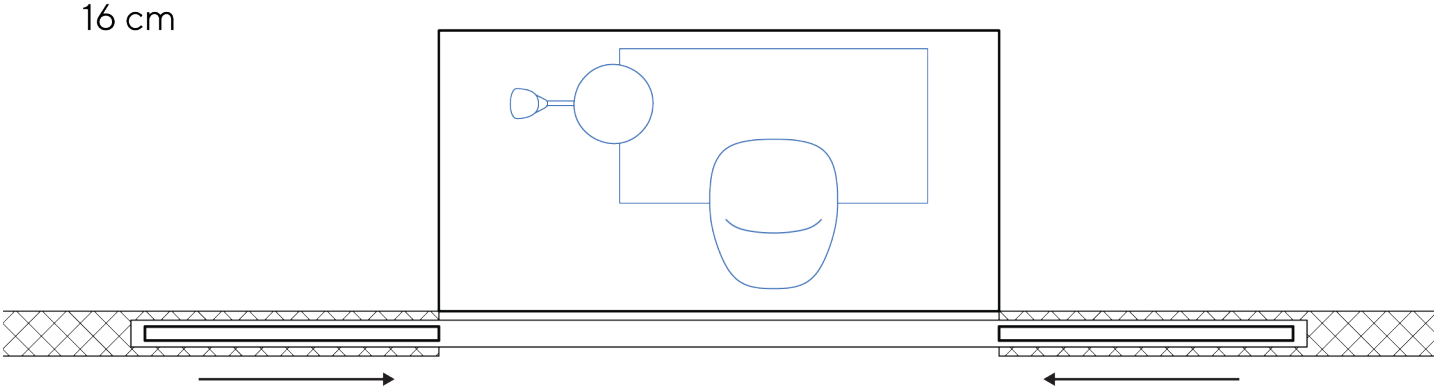
McDonald's

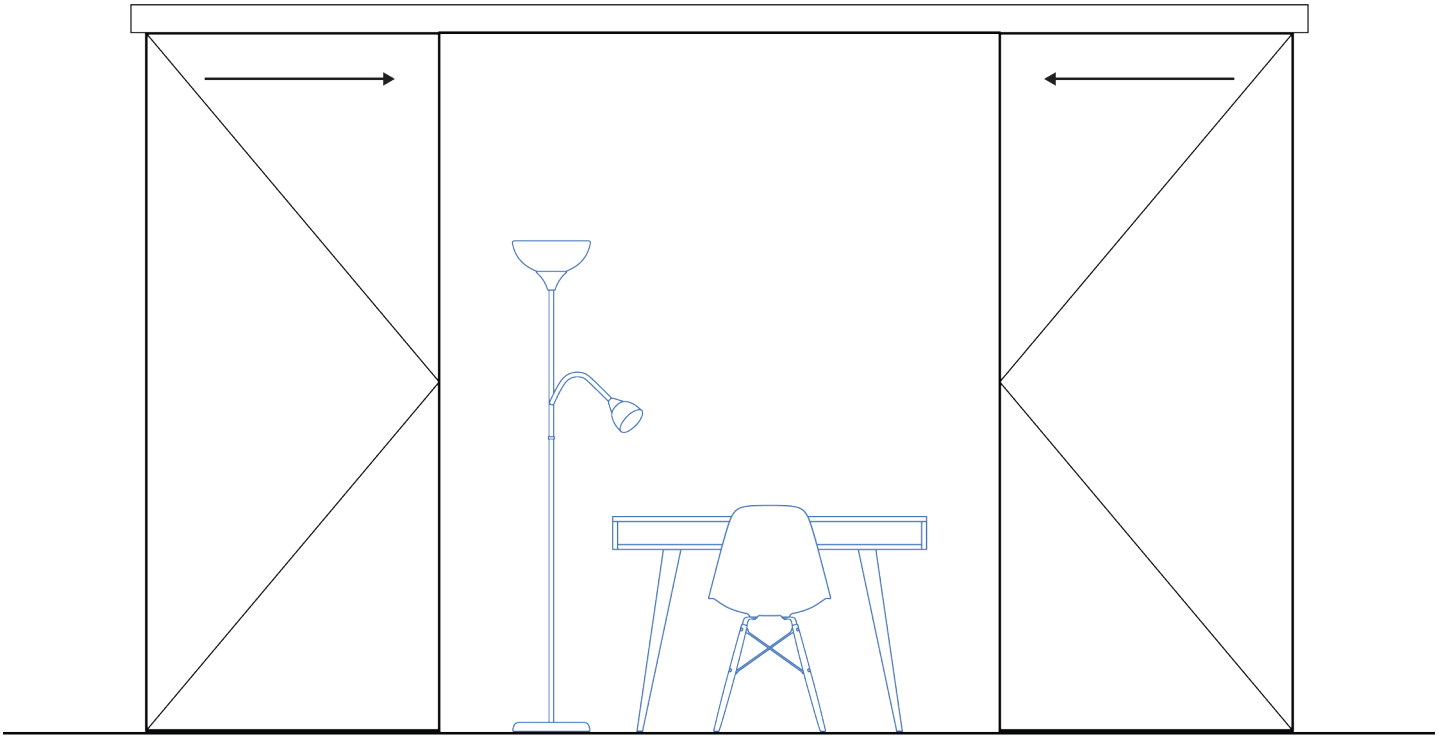
7

Technical Details I




wall
doors
door rail
16 cm





8

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