# alternative**agency**

OBSERVATIONS OF CHANGING ARCHITECTURE AND FUTURES STUDIES

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Changing circumstances has challenged and will continue to change the agency of architecture. Climate crisis, ageing population and technological developments are examples of the forces of change that impact architectural practice today and in the future. Futures studies is a field of research, which can provide a pool of knowledge about change. The gained insight can help to make well-informed decisions for the long run. Long time frames and significant resource investments in architecture are the reasons why understanding dynamics of change and future phenomena are important. Furthermore, designing is an activity requiring futures thinking. It involves a chain of planned actions which aim for a desired outcome yet to exist. Architecture has to be approached as a contingent, dependent and contextual discipline to apply futures studies principles. On the other hand, this assumption acknowledges that architecture is a political activity, because it impacts the lives of citizens. However, it also opens up a possibility to make conscious efforts to change something in society with architecture.

This master's thesis is studying the relationship between architecture and change. The theoretical framework, theories of change, stem from the principles of futures studies and future-oriented design theories. These theories introduce different approaches to understand dynamics of change and strategies of designing and visioning for a longer time frame holistically. Theoretical framework suggests three concept from futures studies relevant for architecture: time, alternative scenarios and choice. Transition design and speculative design are examples of design theories taking these aspects into account. The experimental nature of speculative design can provide new ideas, solutions and innovations, but also examine practice and position of a designer critically. In addition, this thesis explores the future phenomena suggested by futures research and how they impact architectural practice. The gained insight is compared to emerging phenomena in architecture. The future-oriented practices and projects challenge the existing practice in significant and unexpected ways and raise questions about the future of architectural agency.

Keywords: futures studies, speculative architecture, transition design, architectural agency, weak signals, megatrends, black swans

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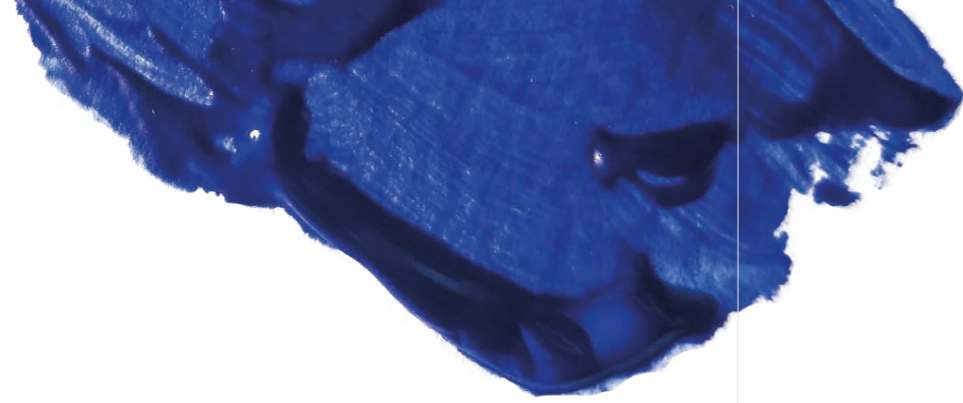School of Arts, Design
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Muuttuva maailma on haastanut ja haastaa arkkitehtuurin toimijuutta ja työnteon malleja. Esimerkiksi ilmastokriisi, ikääntyvä väestö ja teknologian kehitys ovat aikakauttamme määrittäviä tekijöitä, jotka tavalla tai toisella muokkaavat myös arkkitehtuurin alaa. Tulevaisuuden tutkimus mahdollistaa muutoksen tutkimisen, ennakoimisen ja siihen varautumisen, jotta nykyhetken päätökset olisivat pitkällä aikatähtäimellä parempia. Arkkitehtuurin aikajänteet ja materiaaliset investoinnit ovat useimmiten niin suuria, että tulevaisuuteen luotaaminen vaihtoehtoisten skenaarioiden, sekä aikavälin ja valintojen tarkastelun kautta on kannattavaa. Tulevaisuuden tutkimus voi tarjota tietoa mahdollisista tulevaisuuksista ja muutoksen voimista, joista arkkitehdit voivat hyötyä suunnitellessaan rakennettua ja elettyä ympäristöä. Arkkitehtuuri on suunnittelualoille ominaisesti tulevaisuusorientoitunut ala, joka tähtää tietyillä suunnitelluilla toimintaohjeilla tietynlaiseen lopputulokseen, jota ei vielä ole olemassa. Kun arkkitehtuuria tarkastellaan muista yhteiskunnan tekijöistä riippuvaisena alana, tulevaisuuden aikaulottuvuus muodostuu mahdollisuudeksi tehdä tietoisia valintoja ja näin vaikuttaa yhteiskunnan haasteisiin. Arkkitehtuuri osana yhteiskuntaa on poliittista toimintaa, sillä se vaikuttaa kansalaisten elämään. Arvojen tarkastelu on siten olennainen osa tulevaisuuteen tähtäävän arkkitehtuurin ja sitä määrittelevien ilmiöiden tutkimisessa.

Diplomityö käsittelee arkkitehtuurin ja muutoksen suhdetta. Teoreettinen viitekehys koostuu tulevaisuuden tutkimuksen ja tulevaisuusorientoituneiden suunnitteluteorioiden muodostamasta kokonaisuudesta, muutoksen teorioista. Nämä teoriat käsittelevät lähtökohtia, joilla tulevaisuuksia voidaan lähestyä, sekä lähestymistapoja suunnittelun pitkän aikajänteen strategioihin ja visiointiin, kuten spekulatiiviseen suunnitteluun. Diplomityö esittelee lisäksi tulevaisuuden tutkimuksen lähteistä koottuja teemoja, jotka haastavat arkkitehtuurin harjoittamista ja toimijuutta nykyisessä muodossaan. Työssä peilataan tulevaisuuden ilmiöitä ja muutosvoimia arkkitehtuurin kentällä nouseviin ilmiöihin, arkkitehtuurin harjoittajiin ja projekteihin, jotka asettavat alan toimijuuden uudenlaiseen tai yllättävään asemaan. Teoreettinen viitekehys ja ilmiöt tarjoavat näkökulmia arkkitehtuurin harjoittamisen tulevaisuudesta ja arkkitehdin roolista yhteiskunnassa.
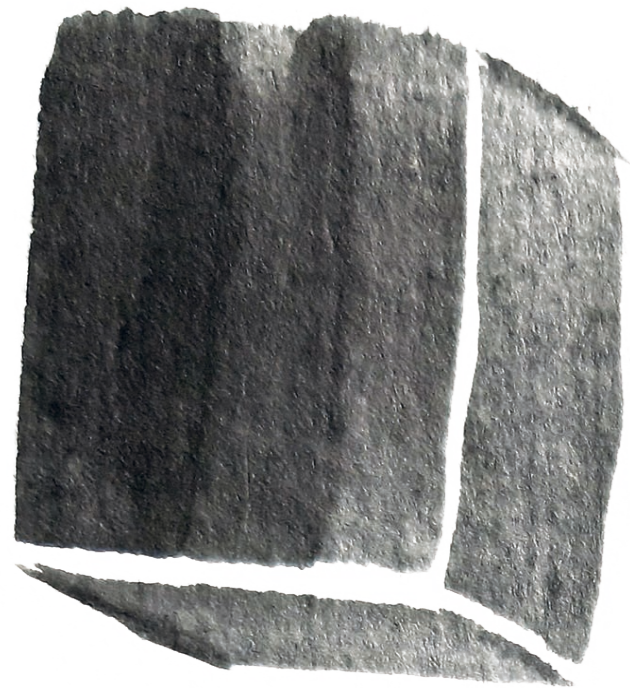
Avainsanat: spekulatiivinen arkkitehtuuri, tulevaisuuden tutkimus, heikot signaalit, megatrendit, arkkitehdin toimijuus, mustat joutsenet

# TABLE OF CONTENTS

# 1.0 INTRODUCTION

This master's thesis is studying the forces of change which are potentially impacting the society and thus built environment and architecture. Due to complex challenges, a critical point of view needs to be obtained to analyse the way we design and practice architecture. Why and how are we practising architecture during next decades while trying to create a more sustainable world? How can local decisions be made when they might have serious global consequences and vice versa? Who are the future architects and what is their purpose? What kind of contributors are they? How can an architect utilise the knowledge of the future to design buildings and cities?

**agency** (noun)
*the capacity, condition, or state of acting or of exerting power : OPERATION*
*a person or thing through which power is exerted or an end is achieved : INSTRUMENTALITY*

(Merriam-Webster Dictionary, n.d.)

# 1.1 TOPIC AND RESEARCH QUESTIONS

My journey with this project can be traced back to Autumn 2019, when I did my exchange studies in Bergen School of Architecture (BAS) on the western coast of Norway. BAS is a bit of a peculiar school, alternative, open-form, both the teaching and the building. The school has occupied an old silo and the students keep transforming it constantly, studio after studio and year after year. In this school, the elevator took you to the floor 6.5, but of course the standard elevator did not have a corresponding button. The communal kitchen had a massive reclaimed bathtub as a cooker hood. The educational environment was very different from where I had studied before, but I think it was exactly where I needed to go in order to start reflecting what I had already learnt and what I would like to learn about architecture. To me, BAS represented a creative platform for asking questions about architecture.

The questions I started to ask myself were about the role of an architect and the practice in society. Who are the future architects? What kind of skills do they need? It was a challenge for me to shift the practical mindset to abstract and speculative one. Nonetheless, it was also rewarding. It was first difficult to grasp on the abstract concepts and questions with design methods foreign to me, such as storytelling. Meanwhile, the BAS students were thinking about what to do with abandoned oil rigs on the North Sea or how to utilise swarm intelligence or how to approach territories after sea level rise. These students did not question whether these massive, problematic questions of resilience or sustainability were something they could or should tackle with the architectural language. There was no question whether that was architecture or a design task or not. After all, I could not help but wonder, should these both skills be qualities of an architect: to be able to connect societal, environmental and cultural questions to the design, but also to be able to translate abstract ideas into a concrete proposals and visions.

Back in Finland, I tried to find answers to my questions and I realised that I could use the knowledge and skills I had learnt from four courses of futures studies in Aalto University to help me understand the dynamics of those changes. What can I learn from the futures and how can I prepare myself when entering into the professional world as a graduated architect? The topic

**Figures 1-4.** Bergen School of Architecture

of this thesis started to become something actually worth studying. Then the Covid-19 pandemic hit. It felt more relevant and meaningful than ever to try to grasp on what sort of knowledge about the changes and strategies I could learn by studying the future of the architecture. My purpose was to understand the forces of change I would be dealing with after graduating.

Futures studies is a multidisciplinary and crossdisciplinary field of research that studies the emerging future and produces knowledge to support policy-making. Thus, futures studies is not detached from the values of the society. Creating the future knowledge is useful in myriad of ways. There are methods and tools to study the future scientifically. There is no absolute way to predict the future except for the laws of physics. Thus, the purpose of studying the future is producing knowledge about possible futures. The future can be designed to some extent and different outcomes simulated. Futures studies can gather information from many disciplines and professions, such as philosophy, economics, anthropology and statistical sciences. As an architect, instead of trying to understand information from all these disciplines, it is more efficient to utilise the insight gained by the futures studies researchers.

Architecture is a unique discipline as it outreaches the designer's table to politics, finances, environment, society and culture. Few disciplines have such a holistic point of view of the lived environment. Due to complex challenges and fragmented reality, it may seem that the responsibilities of the practitioner can become both intimidating and undefined, yet important. The anticipated future developments, changes in society and catastrophes ahead, I wondered, how was architecture and architects approaching these issues? Because of the ephemeral nature of time and the contingency of society, this master's thesis is not trying to make detailed predictions of the future of architecture. This aspect will be further explored in the theoretical framework. Instead, the discussion on changing circumstances and their potential, desired and feared changes in practice and thus the role of a future architect define the purposes of this thesis.

I had difficulties finding the connections between futures studies and architecture, although I had a strong hunch that there was something important to be explored. The connection seemed evident, but I was not quite able to

express it with words. The theoretical framework, the theories of change, which I constructed from theories, ideas and concepts from futures studies and future-oriented design theories, suggested that the missing piece on the puzzle was the change itself. Acknowledging the change and contingency in architecture further guided me to introduce existing future-oriented practices and projects which answered how the change can be initiated, intervened, understood and promoted in architecture. This also requires me to assume that architecture is a complex, contextual and intertwined discipline which is in constant interaction with the surrounding environment and society.

The theories of change in architecture helped me to judge what was relevant to know about the futures studies in this context. It is fairly easy to find forecasts on emerging radical technology but the phenomena defining the social and cultural aspects is far more difficult. I reckon that is due to the history of the futures studies as a tool for organising military activities, business strategies and forecasting technology. Conversely and perhaps surprisingly, the principles of design practices can be considered to be much closer to futures studies, as the design process includes a plan of action for the desired outcome in the future. The futures studies courses I attended were offered by the Department of Design in Aalto University, which made sense to me. Introducing these tools, methods and knowledge to design practices can also expand the impact design practitioners can have in society.

Visioning futures is not completely foreign to architects. Explorations on images of futures can be found in the history of architecture. Especially the 1960s was an age of optimism, when architects organised new societies living in megastructures, space-inspired houses and visioned spatial futures. However, the utopian visions of desired societies during the 20th century were inherently idealistic, detached from reality and time. In the contingent world, the pursue of ideals seem to be doomed to fail.

The futures studies connects the scientific production of knowledge and imagination to the real world. The future of architectural practice therefore is not about defining ideals or utopian images of futures, but learning about possibilities and causal connections in the existing world. In addition, the analysis of stylistic trends would most likely be much more straightforward

and one-dimensional process and thus not an interesting topic for me. Studying the whole spectrum from the utopian to dystopian futures of the contingent practice makes the theme of future architecture fascinating. In this thesis, I introduce *megatrends* as probable forces of change, *weak signals* as emerging phenomena, and *black swans* as powers of surprise.

Architecture allows us to speculate, illustrate, narrate, create and imagine. In other words, it can give a vision, a form, to an alternative reality. Besides, creating future visions is also a documentation of the era of our reality. This master's thesis is an exploration of the questions, alternative scenarios and visions the topic of architectural futures suggest.


**Research questions emerge:**

**What does research of future phenomena, such as megatrends and weak signals reveal about the future of architecture?**

**What kind of questions, opportunities and challenges these phenomena rise in architecture and how do they challenge the architectural practice?**

**How are architects contributing in building and designing the future?**

**How is change initiated, reacted, intervened and understood in architecture?**

## 1.2 RESEARCH MATERIAL

This thesis is based on the literature review consisting of themes and theories from the futures studies, design theory and architectural theory. First set of literature considers futures studies as a field of research and the central epistemological approaches and paradigms. These references define how I approach futures studies in this thesis. The authors have been introduced to me during four futures studies courses I decided to take during my bachelor's degree.

The main references of futures studies are:

*Eleonora Masini, Rethinking futures studies, 2006*
*Mika Mannermaa, Heikoista signaaleista vahva tulevaisuus [A strong future from weak signals], 2004, WSOY*
*Sohail Inayatullah, Six pillars: futures thinking for transforming, 2008*
*Wendell Bell, Foundations of Futures Studies: History, Purposes and Knowledge, 2003, Transaction Publishers*

The aim of this thesis is not to conduct a futures studies research with a specific method, but to benefit from the existing knowledge and research in the architectural context. Thus, I am not using any particular method from futures studies to analyse a phenomenon or produce new information. I am also excluding analysing probabilities from this thesis as it would require a deeper understanding of statistics and mathematics. In addition, those aspects are not that interesting from the architectural point of view in this thesis.

The foundational concepts of the theories in question can further be applied to the design context. I had difficulties to find references to connect futures studies and architecture, although there is a rich history of future-oriented architecture, mainly in visionary architecture. The introduced future-oriented design theories use more or less similar ideas and strategies as the futures studies. These theories differ from many common beliefs, paradigms or models of practices, as they take values, contingencies, political aspects, spatiotemporal continuum and the speculative imagination into account. Thus, they challenge the position of an architect in society.

The main references of future-oriented design theories are:

*Anthony Dunne and Fiona Raby, Speculative Everything: Design, Fiction, and Social Dreaming, 2013, MIT Press*
*Terry Irwin, Transition Design: A Proposal for a New Area of Design Practice, Study, and Research, 2015*

It was rather late during the process of writing this thesis that I found more relevant literature on architecture and the future. The main realisation was that the missing piece in my puzzle was how architects approach time and contingency, which architectural theorist Jeremy Till describes as the two fears of an architect. Instead of superficial forecasts of aesthetic trends, the fundamental aspect of change in architecture is dependecy. It became very clear to me that in order to apply futures studies knowledge, theories or methods in architecture, the defining assumption is that architecture is a contingent discipline which is influenced by society and time, and vice versa. Till's thoughts helped me to frame this thesis within architectural discourse.

*Jeremy Till, Architecture Depends, 2009, MIT Press*

Both futures studies and aforementioned design theories refer to philosophical frameworks, which fall outside of the scope of this thesis. Following the discussed theories, I refer to everyday environments as a broader understanding of architecture. Focusing on one scale would not take into account the transcalar nature of the discussed phenomena and theories in the context of this thesis. It is thus noteworthy that, for example, Henri Lefebvre's *Critique of Everyday Life* (1977) was frequently mentioned in the referred literature. Another close line of architectural theories I followed was critical architecture, albeit the discussion on the autonomy of the discipline was taking a step a little too far from the scope of this thesis. However, it is an interesting topic to dive deep into to reflect the potential impact factors and the role of an architect in society.

Since 2019, I have been making notes and benchmarking many future-oriented architectural projects. These projects and practices have been collected from lectures, magazines, documentaries, courses, podcasts and discussions with teachers, peers and colleagues. I had vague initial ideas about the future of architectural practice, but the theme started to emerge when I realised that I was able to utilise this existing archive which I had managed to build for myself. The next step was to define what would be relevant and interesting within the scope of this thesis. This was the moment when the futures studies crossed my mind. I started to read futures studies websites and reports to understand what kind of images of futures were painted and how built environment was represented in them. Furthermore, I compared the emerging themes to the architectural projects and practices. The earliest example is *Talsinki/Hellinna,* by Demos Helsinki, 2009, and the latest project is *The Planet After Geoengineering* by DESIGN EARTH, which is on display in Venice Architecture Biennale 2021 at the time this thesis is being written.

The main futures studies references I have used are reports published by the Finnish Innovation Fund, Sitra, and the Committee for the Future of the Finnish Parliament. Hence, I decided to focus on the Finnish context and perspective. However, it is noteworthy that this delimitation to the Nordic Welfare state allowed me to leave out many urgent and serious problems in the world. Nonetheless, these questions are relevant for Finnish architects as well, because of the intertwined global reality, but they would deserve to be studied thoroughly in the relevant context. It is also noteworthy that in addition to these reports, I tried to immerse myself as deeply as possible into the themes of futures by following news, listening to podcasts with leading experts explaining complex scientific and technological concepts with layman's terms, and franckly to be aware of the emerging things around me.

Thus, the main reports are:

*Mikko Dufva, Megatrendit 2020 [Megatrends 2020], 2020, Sitra*
*Mikko Dufva, Heikot signaalit tulevaisuuden avartajina [Weak signals expanding the future], 2019, Sitra*
*Osmo Kuusi and Risto Linturi, Suomen sata uutta mahdollisuutta 2018–2037: yhteiskunnan toimintamallit uudistava radikaali teknologia [Societal transformation 2018–2037, 100 anticipated radical technologies, 20 regimes, case Finland], 2018, Finnish Parliament*

The time frames suggested by these reports vary. They are mainly focused on short-term changes which have long-term consequences and impacts. Therefore, the time frames are important, but not definitive. I decided not to set any target year as it would have been rather unnecessary or artificial delimitation. The themes discussed are relevant for the near future and thus relevant topics already for the decision-making today. On the other hand, the decisions most likely have long-term implications. This is an important aspect, because it is often stated that a lifetime of a building can be from 50 up to 200 years in average, structure being the most permanent element. However, many buildings, or even areas are already being demolished earlier due to requirements for increased urban density, poor building materials or just outdated style, to mention but a few.

# 1.3 STRUCTURE

The theoretical framework for this thesis is introduced in Chapter 2, Theories of Change, after the introductory chapters. It discusses the theories of change and strategies for approaching uncertainty in architecture. The framework is constructed with theories borrowed from futures studies, architectural theory and design theory. The images in the second chapter create a visual narrative exploring the history of visionary architecture. This narrative represents how architects have approached and discussed future visions in the past and their inheritance for the existing practice. The narrative is focused on the 20th century.

Chapter 3, Changing Architecture, explores the future phenomena in architecture, which are based on the findings in futures studies literature. Thematic groups are discussed as phenomena, not in detailed descriptions of futures or certain innovations. The chapter sheds a light into these phenomena which are challenging the existing architectural practice in relevant, even profound ways. Each theme begins with *Future Visions* -section, which introduces the themes with the findings from the futures research. Existing future-oriented architectural projects and practices are explored with what if-scenarios suggesting alternative architectural agency compared to the status quo of today's architectural realm.

Chapter 4, Discussion, reflects the theories of change with the findings from the third chapter. I return to the themes introduced in Chapter 2, Theories of Change by addressing values and the role of an architect again, now with the insight gained from the Chapter 3. The status of architecture in society is discussed.

Vocabulary after the main chapters define the words and terms used in this thesis, based on my understanding of them in this specific context. For example, I am using *futurist* as a futures studies researcher, not as an artist of an Italian 20th century artistic movement *Futurism*. Another note on language I would like to clear at this point is the word *futures* (plural) compared to *future* (singular). The futures thinking is referred in a plural form, because the focus is on the possibilities of many different paths, not prediction of one future. Moreover, future thinking in singular form can be mistaken as a thinking activity taking place in the future moment.

## 2.0 THEORIES OF CHANGE

Hashim Sarkis, Roi Salgueiro Barrio and Gabriel Kozlowski (2020) state two fundamental questions for the 21st century architects:

*"What does architecture do for the world?"*

*"What does the world do to architecture?"* (p. 7)

These questions are impossible to answer without awareness of the existing circumstances in the society. They draw attention first and foremost to the contextual nature of architectural practice. Practice is heavily focused on problem-solving models of designing and concrete objects in the real world. The questions call for a more holistic point of view in architecture, which requires deeper understanding of the spatiotemporal continuum, where change and planetary scale is present.

## 2.1 FUTURES STUDIES AND CHANGE

Studying the future is difficult to grasp, but still a part of everyday life. According to futurist Wendell Bell (2003, p. 142), futures thinking is part of human action. Planning anything requires an ability to think many steps, often complex causal chains, ahead. Furthermore, design theorists Anthony Dunne and Fiona Raby (2013, p. 3) state that design is inherently a future-oriented practice. A course of planned actions is defined in order to achieve a desired outcome in a controlled manner. The process is rarely straightforward and adaptation, reiteration and even pivots are needed along the way to design something in real life. Hence, practising architecture is inherently a future-oriented action. The produced knowledge about the project during the process is often neglected, although there is a vast potential for the speculative alternatives and gained knowledge. Thus, speculation has value in itself.

The architectural knowledge about the world is not only for architects themselves but for other professions as well to study and use (Sarkis, Salgueiro Barrio & Kozlowski, 2020, p. 7). Moreover, design practices and knowledge could facilitate discussion, debate and speculation about the future for a public audience (Dunne & Raby, 2013). These aspects represent a dimension beyond the spatial, material and aesthetic organisation in architecture. Architecture simultaneously produces knowledge about the surrounding world with the architectural tools and language, whether it is with drawings, narratives or visualisations (Sarkis, Salgueiro Barrio & Kozlowski, 2020, p. 7). Architectural theorist Jonathan Hill (2007, p. 169) reminds that architecture can be critically studied and questioned by drawing, writing or talking, which are also ways to produce architectural knowledge detached from the built realm.

Design researcher Ramia Mazé (2019, p. 24) states that the relationship between futures studies and design is expanding and the interaction between these disciplines can have a significant impact on policy-planning, market forces and cultural imaginaries. Futurist Sohail Inayatullah (2008, p. 11) claims that *masculinist reductionism* is not responding to today's problems in society anymore and thus adopting the holistic point of view is urgent. The futures studies is interested in the intertwined connections in the natural

systems of the world and the time frames from the past to the present and to the future. Bell (2003) states that futures studies should be accessible to other disciplines and even to individuals by providing information, tools and methods, but this interaction can be mutual. Vice versa, future-oriented knowledge about architecture can share insights with futurists. Architecture and futures studies also share similar attitudes in gathering and analysing information in a methodological way and interpreting it with creative, innovative and imaginative approaches. Thus, architects can add another voice into the discussion of the future visions.

The connection between architecture and futures studies can be found in the contingent world. Architectural theorist Jeremy Till (2009, p. 73) argues that architecture is a contingent discipline, although time and dependency are two fears of an architect. Studying the future phenomena is not relevant in an architectural context, if architectural project is approached as an independent, autonomous object without cultural, economic, political, environmental or social connections to the external environment. Furthermore, the temporal dimension of architecture allows space to be social and active, free from formalism (Till, 2009, p. 96). Rather than being a static abstraction, architecture can be seen as a dynamic social system (Till, 2009, p. 14). Thus, the holistic point of view in architecture requires us to accept the contingency and dependency in architecture.

Holism in architecture can be explored and expanded with the framework futures studies provides. Three relevant themes emerge: time, alternative scenarios and choices. These themes are further discussed in the following sections. They define what change is and how it can be studied and approached.

## TIME

Till (2009, p. 94) argues that the Vitruvian understanding of architecture, *firmitas, utilitas,* and *venustas*, is inherently an attempt to gain order and control with material and aesthetic organisation over an uncertain world which is in the state of chaos. Time and uncertainty challenges the control over these aspects of design. On the contrary, futures studies tries to understand reality through contingency and dynamics of change. Temporal aspects such as physical decay and social changes reveal the contingent nature of architecture (Till, 2009, pp. 92, 106).

Finnish futurist Mika Mannermaa (1999, pp. 25-26) defines three main paradigms of futures studies: descriptive, scenario-based and evolutionary futures studies. Descriptive futures studies is based on extrapolating trends and quantitative measures, such as population growth or economic forecasts. They try to find the causal connections and predict the future with relevant metrics. Scenario-based futures studies focuses on multiple images of futures without emphasising probabilities. Evolutionary futures studies offers a framework for understanding the change itself in society. It is based on the assumption that time is linear with past, present and future, but the progress and development happen at different paces. Society is never in equilibrium state, but in constant fluctuation. Development is slower during stable times. Turbulent, uncertain times allow disruptive interventions to change the society faster. These turning points can be seen as an opportunity to create positive change. (Mannermaa, 1999, p. 26; 2004, pp. 49-50, 55)

Inayatullah (2008, p. 7) suggests similarly that mapping the past, present and future as well as identifying *shared history*, continuities, discontinuities, stable times and accelerated times of development, offer us an understanding of the forces that change the future. Dynamics of change are complex and multidimensional processes which are interconnected and in interaction with each other (Mannermaa, 2004, pp. 59-60). *Anticipation* draws the attention to emerging issues in society and *timing the future* is a matter of incentives, social structures, laws and technology (Inayatullah, 2008,



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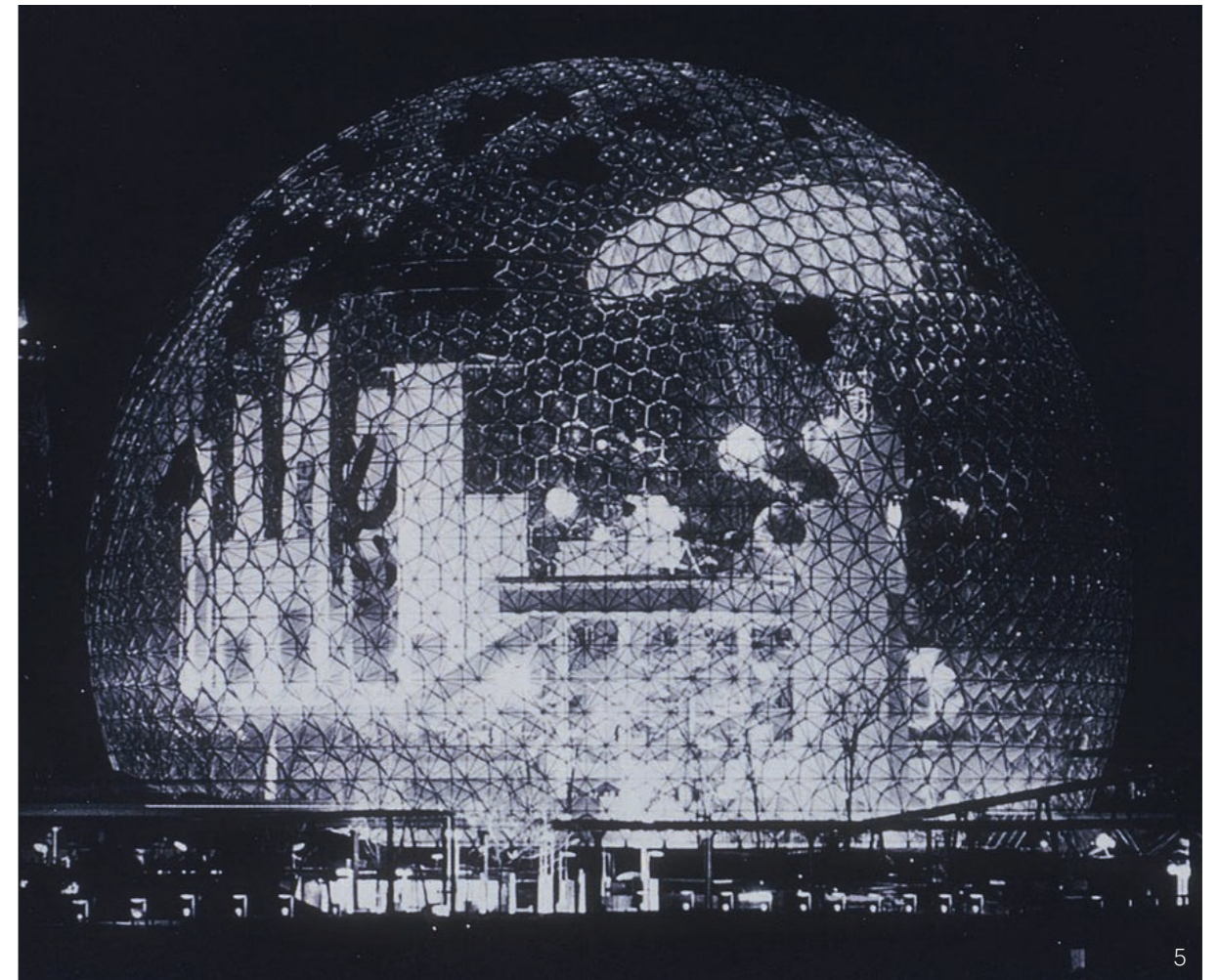
**Figure 5.** R. Buckminster Fuller, *Montreal Biosphere,* 1967.
R. Buckminster Fuller approached his designs as parts of a greater system. The *Spaceship Earth* was his interpretation of the society living on this planet where everything is intertwined. His studies from micro to macro and technological innovations to environmental concerns include his most known invention of *geodesic domes*. The United States Pavilion for Montreal Expo 1967 was one of the built domes on a scale of a building. Some of the more speculative studies propose a climate controlling dome over Manhattan in New York City. (Fuller, 1964, pp. 21-93)

pp. 8, 10-11). These approaches define the assumption that future can be impacted. Consequently, shaping the future with design requires a designer or an architect to understand the change and the forces from the past and present, which are guiding the direction of change in the future.

Mazé (2019) defines: *"In a philosophical sense, political dimensions of futurity can include how reality and futurity are conceived, how present and future phenomena can be known, and what difference our conceptions, knowledges and choices make."* (pp. 24-25) The political dimensions of design are dependent on the understanding of time and the consequences we are able to anticipate based on the decisions. Futurist Eleanor Masini (2006, pp. 1165) states that we have no control over the past and present, but the future can be shaped with decisions in the present. The past can be studied through the facts, the present through existing possibilities but no such concrete evidence exists of the future (Bell, 2003, p. 148). In other words, the causal connection between past, present and future exists, but we cannot study the future empirically. In addition, there will always be gaps in our knowledge (Mannermaa, 2004, p. 33).

**Figure 6.** Linear time with causal connections can be observed over a period of time in gradual changes. Circular time is a repeating time period, like a day.

Linear time is a matter of political decisions, development and progress as well as the consequences of past decisions. However, the cyclical time, like day or seasons, is often more relevant for architects, because the focus is on the everyday environments (Till, 2009, p. 79). Architects try to grasp on how the space is used daily more often than how the space changes and the use is changed over a longer period of time. Futures studies draws the attention to the awareness of the long-term consequences and goals, but simultaneously takes present knowledge and short-term decisions in to the consideration (Masini, 2006, p. 1165).

The timeless architecture as a modernist heritage does not agree with these dependencies time reveals (Till, 2009, p. 81). Architectural practice

**Figure 7.** Matti Suuronen, *Futuro,* 1968.
1960s were an age of optimism and was reflected to the imagination of architects, such as the speculation of future living spaces. Matti Suuronen's *Futuro* is a first plastic house designed for massproduction, which was actually realised. The house was eight meters in diameter and four meters high and was designed to be easily transported with a helicopter, for example. The production ended after the oil crisis in the 1970s, but some houses are still spread around the world. Existing *Futuro houses* are unique fragments of the 1960s space enthusiasm. (Ronkka & Suuronen, 1969; Hautajärvi, 1998, p. 24) *The Futuro house* in Joshua Tree California, United States of America, is still available for overnight stay with AirBnB.

emphasises problem-solving, which can be a one-dimensional approach to design when a longer time frame is considered. Temporality and permanence are being perceived differently depending on the time frame in question. Temporary solutions become permanent and permanent solutions temporary. The problem is that architects are trying to freeze time in order to gain order and reduce a complex design task to an aesthetic and technical problem (Till, 2009, pp. 77- 79, 88).

Mannermaa (2004, p. 59) claims that technology changes faster than societal and cultural structures. This fact sets architecture in a tricky position. Architecture often represents stability in a flux of everyday life, but still has to adapt to the current circumstances and needs. In other words, architecture operates on the cyclical time of everyday life, but has to adapt during a longer periods of the linear time. A city full of monuments would not be able to facilitate lively and funtional urban life. Technology shapes the lived environments through lifestyles and technical construction innovations, and the time frames connected to them seem not to fit into the frozen image of time.

However, the zeitgeist often defines how architecture is practised and what kind of architectural projects are realised. Techno-utopian optimism can be seen in R. Buckminster Fuller's *Geodesic domes,* as seen in Figure 5, or the enthusiasm of the Space Age in Matti Suuronen's *Futuro-house (1968),* as seen in Figure 7. The brief of *the Parc de La Villette* (1986), as seen in Figure 9, by Bernard Tschumi was about reimagining what would define a 21st century park. Thus, the moment in time can be later observed and analysed in the designs.

**Figure 8.** After Brand (1994), spatiotemporal system of a building includes subsystems of site, structure, skin, services, space plan and stuff.

Stewart Brand (1994, p. 20) expands Frank Duffy's model of a building as an adaptive system with subsystems; *site, structure, skin, services, space plan* and *stuff* (see Figure 8). These subsystems have different lifecycles. Site barely changes, but the facade has to be replaced sooner or later and interior design is remodeled with the current aesthetic trends. Thus, combining these systems together may be problematic when a building needs to adapt to the needs and circumstances of the present moment. Designing for time could

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**Figure 9.** Bernard Tschumi, *Follies and Galleries Parc de la Villette Paris, France Frontal axonometrics*, 1986.

A competition for *Parc de La Villette* in Paris in 1982 gathered visionary architects to reimagine a park of the 21st century. Bernard Tschumi's proposal was selected to be realised. The proposal is a system of points, lines and surfaces where the points, the red follies, organise the grid over the 135 acre park. Tschumi's design represents the fragmentation of reality which he considered to be more relevant for the era than the modernist search for coherence. (Spiller, 2006, pp. 143, 145)

be described as *evolutionary design,* where a process of building design is just a starting point. (Brand, 1994, pp. 188-189) Thus, Brand's model takes into account both cyclical and linear time frames.

Thus, time in architecture is my first observation to start tracing the connection between futures studies and architecture. However, it requires to assume that architecture is contingent practice and inherently dependent on different stakeholders. The causal connections between past, present and future can produce different consequences in different circumstances. Consequently, the next section introduces the concept of alternative scenarios.

## ALTERNATIVE SCENARIOS

Futures studies is based on the foundational assumption that there are multiple futures, which can be studied and influenced by human action. The future cannot be predicted but the knowledge about possibilities and probabilities as well as attitudes and values toward the future can be scientifically and methodogically studied. Therefore, the purpose of the futures studies is not to create blueprints for the future. (Bell, 2003; 2004; Masini, 2004) The world system is far too complex and uncertain for creating one plan for one future. These assumptions open up the possibility that the future can be shaped by designing. Moreover, well-informed design decisions should be based on the knowledge about the past, present and future. Current circumstances are the result of past decisions and our understanding of tomorrow will be reflected to the future (Dunne & Raby, 2013, p. 160).

Visioning alternative societies and architectures facilitating utopian life has been explored in the history of architecture. Visionary and paper architecture have taken a critical approach to social issues and studied theoretically and introspectively architectural means to build societies (Dunne & Raby, 2013, p. 23). Paper architecture and visionary architecture have offered a tabula rasa for drawing otherworldly solutions to crises and problems, like housing scarcity. For example, *megastructure* movement, as seen in Figures 10-13, answered to urban sprawl by exploring the possibilities of societies living in one large structure facilitating urban life. On the other hand, there is a vast
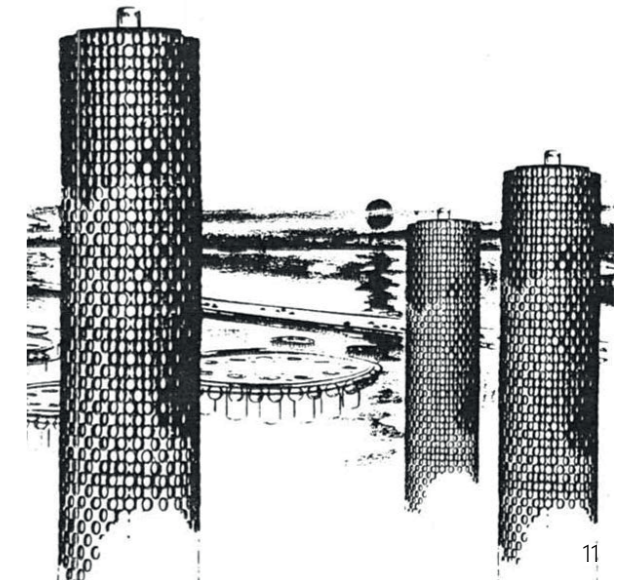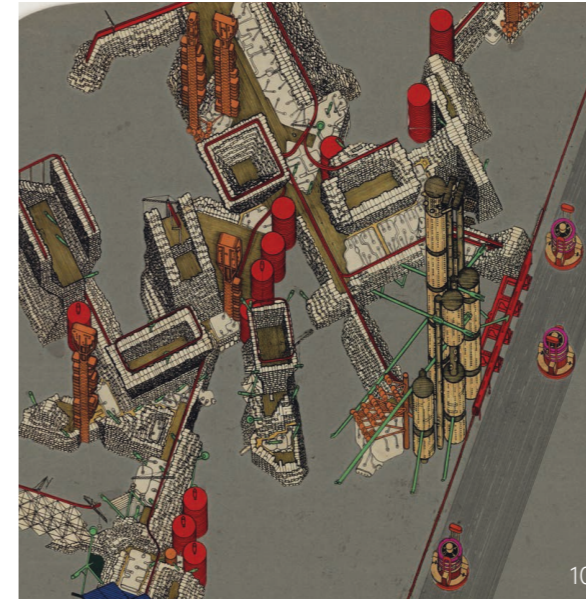





**Figure 10.** Archigram, *Plug-In City,* 1964.
**Figure 11.** Kiyonori Kikutake, *Marine City,* 1958.
**Figure 12.** Peter Chamberlin, Geoffry Powell and Christoph Bon, *The Barbican Estate,* 1982.
**Figure 13.** Kisho Kurokawa, *Nakagin Tower,* 1972.

The megastructure movement stemmed from urban sprawl and the will to create a vision for reorganisation of the urban realm and society with monumental architecture. For instance, modular structures were inhabited by fun-loving, playful *Homo Ludens.* Japanese Metabolists joined European architects in visioning new cities in megastructures, for example. Most of the utopian megastructure architecture remained on the paper, such as Archigram's *Plug-in City* and Kikutake's *Marine City.* (Banhamn, 1976) However, fragments of the movement can still be seen in *The Barbican Estate* in London and *Nakagin Tower* and capsule-culture in Japan, for instance.

history of alternative futures of unbuilt projects just because of economic and political decisions (Dunne & Raby, 2013, p. 24).

The architectural production in real life is often expensive and require significant economic and material investments. Furthermore, the architectural design process is full of creating alternatives, but the knowledge they offer or produce are often neglected after the design is built. The emphasis of the finished building process, the object, alienates the organic production of alternatives from architecture and its purpose of creating knowledge about the world.

The aforementioned scenario-based approach is common in futures studies and scenario-planning is a widely used method to explore alternative circumstances. A scenario can provide valuable and significant information about the future if the knowledge about the consequences of certain events are remarkable in society. In other words, scenarios offer different scripts of the future and the insight they provide about the possible futures is valuable. (Mannermaa, 1999, pp. 25-26) Alternative futures emphasise the ability and flexibility to adapt and thus avoid making the same mistakes over and over again (Inayatullah, 2008, pp. 5-6). Scenario-planning as strategy is used especially in the field of corporate business to vision desired developments for growth. Nevertheless, the principles of scenario-planning are much closer to design practices.

Architecture proposes manifold forms of alternatives, whether they are drawings, visualisations, narratives or scale models. These are tools of organisation and mediums which through the visions are imagined and thought. Creating alternatives is dependent on the ability to shift perspectives, which scenario-planning encourages. Scenario-planning share many similarities with the architectural design process. First, background facts and information need to be studied carefully and analytically to create logical connections between past, present and the future. Second, the creation of images of the future requires imaginative, innovative, creative and intuitive endeavours. Thus, scenario-planning is holistic, anticipatory, qualitative, unique and subjective in nature (Mannermaa, 1999, pp. 37, 62). It is almost as if the scenario-planning gives a permission to think unconventionally, to discover

the extremes, the spectrum from positive to negative. Despite the similarities, scenario-planning has not been methodologically used widely in architecture. The closest example can be found in urban planning; The City of Helsinki has used scenarios in urban planning to vision city bulevards in 2050 by defining *business as usual* and *bulevard* scenarios and their impacts to workplaces, for example (Helsingin kaupunkisuunnitteluvirasto, 2015).

Scenarios embrace the uncertainty. According to Inayatullah (2008, p. 15) scenarios open up the present by exploring the uncertain. Probabilities per se do not matter as much as the gained insight. The spectrum of feared to desired and improbable to probable scenarios can be constructed around a reference scenario, which is often called *business as usual* -model, Business as usual -scenario is based around the assumption that development continues in a similar fashion from the present to the future. However, business as usual is just one scenario and should not be taken as a blueprint. (Mannermaa, 1999, pp. 39, 58; 2004, p. 26)

Scenarios produce knowledge about possible futures. This knowledge, tools, skills and mindset futures thinking generates and produces, creates *capacity* for individuals, communities or organisations to change something (Inayatullah, 2008, p. 6). Most probable scenarios of the future are somewhere in between utopian and dystopian narrative. However, it is worth exploring the whole spectrum of scenarios to define the desirable goals. The gained knowledge can be studied to discover various outcomes. The value of the knowledge is measured both in mere quantity of the material but also in quality. The more relevant information, the more perspectives are gained to manage unpredictability and uncertainty.

Scenario-planning is an ongoing, long-term process. Scenarios are like mid-term feedback reports as scenarios, planning, decision-making and human activity are always in interaction with each other. Present forces of change can lead into different outcomes based on which perspective they are studied from. Normative scenarios are created retrospectively from future to the present and explorative scenarios include past and present trends extrapolated to the future. Different scenarios can be produced by changing basic assumptions. (Mannermaa, 1999, pp. 33, 45, 58-59)

Creating architectural alternatives requires a shift in thinking patterns. Till (2009, p. 14) reminds that *radical thinking* is different from *a radical form*. Alternatives creating change stem from new ways of thinking, not alternative forms of the same design task. Till (2021) describes the power of narratives as trying to avoid being limited to architectural form:

> *''[...] the perhaps most importantly, is the central role of design and the new architecture envision new futures, not in an ungrounded or merely speculative manner but in a way that materialises and spatialises revised social conditions and relationships. The creative act is here a form of storytelling, in which alternative narratives might be imagined.''* (p. 37)

The alternative scenarios thus challenge the problem-solving process of architectural practice. Alternative scenarios broaden the spectrum of possible images of the future not only to optimistic and positive scenarios, but to negative narratives. The negative futures are not foreign in creating alternative worlds in science fiction, art, film, literature and television. This will be explored further with speculative design. However, the alternatives create yet another aspect of studying the future: choosing what is desirable and what is not and how to act in order to shape the future in a desired manner. Hence, the choice emerges.

## CHOICE

Futures studies and architecture related to everyday life are contextual and thus involve judgement of values. Choice emerges from alternative scenarios and from the assumption that change can be initiated (Masini, 2006, p. 1162). Time frame sets the temporal context of change, scenarios provide the insight of possibilities and values define the action by creating a vision. Visions are an important aspect of futures studies. They stem from the present possibilities which are evaluated and defined to a desired image of the future with related goals (Masini, 2006, pp. 1163-1164). Masini (2006, p. 1166) considers action as a part of futures studies, which creates *a futures project* with political and ethical dimensions.
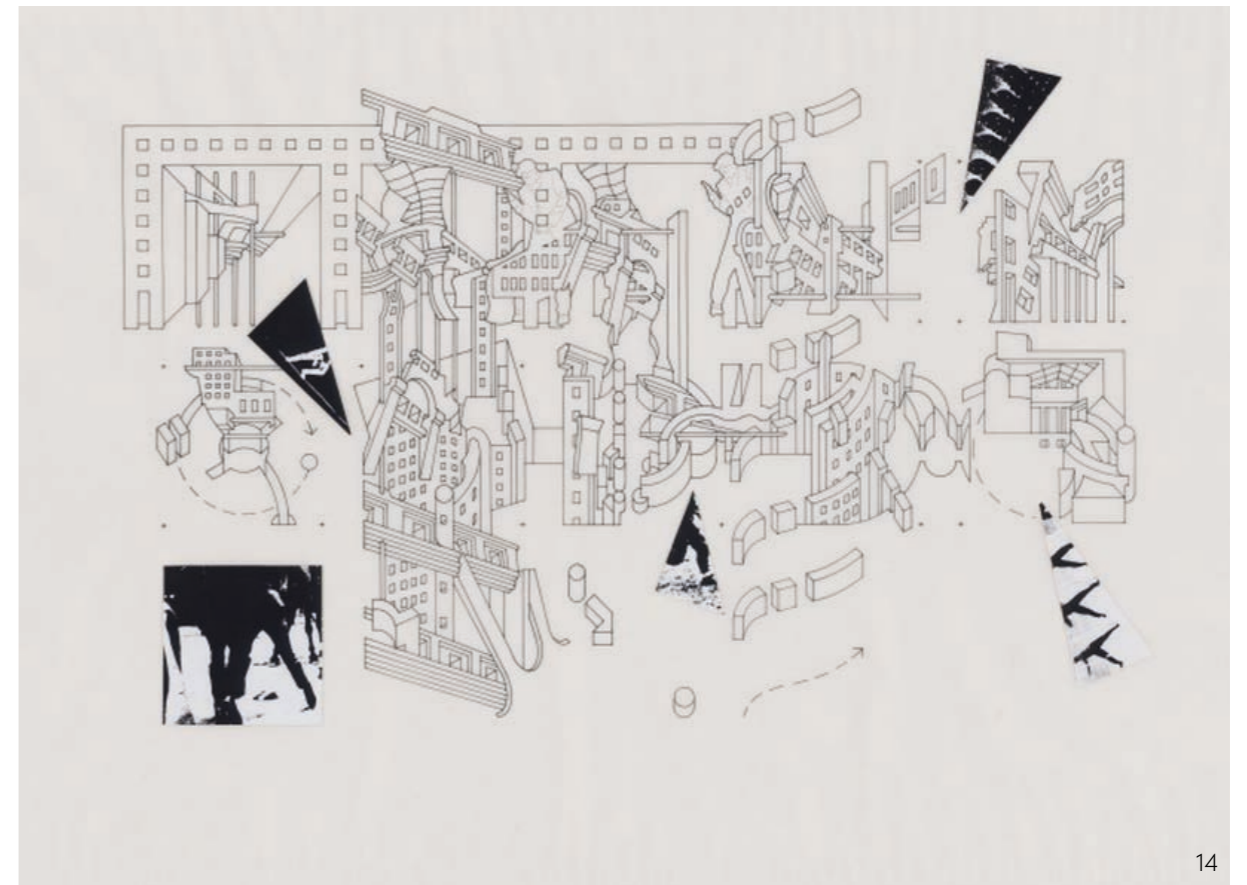
**Figure 14.** Bernard Tschumi, *The Manhattan Transcripts project Episode 4: The Block New York City, New York.*, 1980-81.

Bernard Tschumi's *The Manhattan Transcripts* emphasises the importance of writing and drawing the spatial explorations and experiences to create knowledge about the surrounding world. The project is also a criticism toward the capitalist focus on the built form of architecture. Tschumi traces 20th century urban life, events, in architectural narratives by following the legacy of Dadaists, Surrealists, Futurists and Situationists. (Spiller, 2006, pp. 124-126)

Masini (2006, p. 1162) identifies different philosophical approaches to the futures studies: identifying what is possible and probable, creating visions of desired societies and making synthesis of the two in the form of a project. Consequently, a plan of action is a result of gathering information and defining values. These approaches are close to Mannermaa's paradigms. Possible futures can be defined and produced with scenario-based futures studies and probabilities analysed with descriptive futures studies. The project-approach adds a dimension of choice, definition of value system and action. Connections between man, society and the environment are in constant flux and the philosophical approaches try to understand and define the existing connections (Masini, 2006, p. 1162).

*Deepening the future* refers to understanding the different levels of reality. The foundational questions about existence are analysed by going beyond the self-evident. This can be done by analysing not only mundane beliefs but also worldviews and metaphors and their meaning in everyday life. (Inayatullah, 2008, p. 12) On a societal level, a specific era can be described with the terms of the most dominant forces of change. These are often something that define the zeitgeist. Future is not emerging in a void, but is always interacting with the natural, scientific, economic, cultural and social world. For instance, Mannermaa (2004, p. 16) describes the turn of the millennium as the beginning of a transition from *information society* to *biosociety*. Risto Linturi and Osmo Kuusi (2018) mention *ubiquitous society* and *experiential society* as something we are shifting toward now. Mikko Dufva (2020) uses the widely acknowledged geological term *anthropocene* to describe the current era, but mentions the *post-fossil* and *post-oil era* as well. These descriptive words of the society can be regarded as a framework where the value-system with all its nuances is developed. The broader societal shifts define what we value as a society.

Acknowledging that something can be different raises questions conserning the value systems. What, who, how, when, for whom, what is the difference, can or should something be done? (Mazé, 2019, p. 26) Furthermore, we can ask what is a positive change? Mannermaa (2004, p. 52) separates development from progress by stating that progress involves a value system. However, values are not static, but in constant flux with society, time and place and should thus be re-evaluated constantly (Masini, 2006, p. 1167).

The reassessment of values is important to make conscious choices. Persisting on conventional thinking can be a common problem because the possibilities and threats are not always discovered, observed and analysed. People can fail to think that impossible is possible or vice versa. Not trying something because it is considered impossible is much worse, because trying impossible is a potential chance for learning something new. (Bell, 2003, pp. 75-79) Mannermaa (2004, pp. 27-28) emphasises the risks of holding on to the past and overlooking new things and phenomena. Masini (2006, p. 1162) reminds that by focusing only on what has been done and what exists, the changes do not occur in the desired way. We need to be able to judge critically what is worth preserving and saving from the past and the present and what is not (Mannermaa, 2004, p. 53).

Another problematic value-related issue is, whose value system is used and where. Inayatullah (2008, p. 5) describes the problematic adoption of *used futures*; following visions, values and goals which are defined during another time or by someone else. Some Asian cities, which have been built from nothing according to the Western ideologies in urban planning, are examples of using used futures as visions (Inayatullah, 2008, p. 5). Consequently, sensitivity toward other's values is crucial (Masini, 2006, p. 1167).

Dunne and Raby (2013, p. 3) state that new design roles, contexts and methods are needed in order to speculate the future possibilities. Tschumi's *Manhattan Transcripts project* (1980-1981), as seen in Figure 14, is an example of approaching producing architectural knowledge from a different perspective. On the other hand, *The City of the Captive Globe* (1972) by Rem Koolhaas and Zoe Zenghelis, as seen in Figure 15, try to grasp on the abstract, intellectual level of what the New York presents. These two project shed a light on how architects have seen the existing in a new way and thus been able to develop the discipline itself.

Used futures describe exactly why holding on to existing practice can be problematic in the changing world. Till (2009, pp. 166-167) argues that the problem-solving model of designing is a rather conservative way to approach architectural practice, because it is based on what exists rather than prospective possibilities. However, the reassessment might not require

changing the practice completely, but redefining and reframing the existing models. The practice based on problem-solving can be an efficient way to design something to be realised, but perhaps the design problem itself needs to be reframed. Approaching the whole designing process as a merely a problem-solving task is a rather narrow approach to define architectural design process.

The problem-solving model of practice allows an architect to stay neutral or objective, because the design problem is already defined by someone else. Nevertheless, the objective position is illusory as can be learnt from the concept of the used futures. An architect is serving someone else's values. Moreover, the contingency can be once again mentioned in this context. Being aware of one's own value-system as well as other's exposes the fact that an architect can be objective and neutral just to a certain extent. Accordingly, the used futures reveals the ramifications of trying to be completely objective in the contingent world.

Inayatullah (2008, p. 7) encourages one to challenge their own hidden assumptions, thoughts and predictions. Awareness of one's own value system draws attention also to the cultural and social contexts. However, the emphasis on values is not something futurists or architects should be explicitly judging by themselves, but being aware of both their own and other's values creates choices. Dunne and Raby (2013, p. 161) believe that design practices should trust the judgement of people and change can be initiated by offering alternatives rather than just one option. Decision-making is thus based on a bottom-up model instead of a top-down hierarchy. This is possible because of making conscious, transparent evaluations. Clearly communicated values can be considered a social responsibility (Masini, 2006, p. 1166).

Future-oriented design has often a political, value-related dimension, even if not explicitly stated (Mazé, 2019, p. 27). Architecture is political, because it involves choices that impact on the lives of citizens (Till, 2009, p. 124). Design can act as a mediator between abstraction and reality by offering choices and encouraging citizens to judge themselves what is right and wrong. Thus, the market driven hierachy is shifting toward bottom-up decision-making, where design can nudge us toward some sort of behaviour. (Dunne & Raby,



**Figure 15.** O.M.A, Rem Koolhaas, Zoe Zenghelis, *The City of the Captive Globe,* 1972.

*The City of the Captive Globe* is an example of expressing knowledge about the surrounding world with architectural language. The illustration represents variety of ideologies and philosophies in a rational, regular grid of New York City's urban fabric. The project embraces New York's character as a microcosm with each block and each idea.

2013, p. 160) Thus, communicating visions and scenarios through design methods and materialised and represented forms is also a political question (Mazé, 2019, p. 26). Futures studies is still dominated by technocentric, Western and gender-biased voices (Mazé, 2019, p. 34). It can be questioned whether futures studies can provide a truly holistic insights about the future or not. Nevertheless, an opportunity to add a more socially and culturally inclined voice opens. As inherently generalist professionals, architects could contribute to the discussion.

Holistic approach to a design task is not foreign for an architect. We are taught to take the historical, cultural and social context and location into account and it often happens naturally through using tacit knowledge. My suggestion in this thesis is to broaden the holistic approach stemming from the discipline itself with learning from the alternative scenarios and time. *Alignment* is a concept which connects the different scales of action and decision-making to the vision. Alignment refers to aligning decision-making, actions, behaviours and approaches from mundane life to the broader picture (Inayatullah, 2008, p. 6). Thus, alignment is  the key to understand and apply the holistic approach to design tasks throughout the scales. Fundamentally, it is about focusing on things that actually matter. It helps an architect to see the design project with numerous design tasks in a greater context. The call for addressing planetary scale in architecture by Sarkis, Salgueiro Barrio and Kozlowski (2020) can be further considered as a transcalar issue with the concept of alignment. More importantly than considering the whole planet as a design project, each design task can be connected to a broader context with consequences and impact on the planetary system.

Time, alternatives and choice expand the understanding of change and contingency in architecture. They reframe the practice and design process toward a holistic approach. Change can be more or less uncertain and develop at highly varying pace. Certain alternatives can be promoted and thus the future shaped. Next, the main forces of change, emerging phenomena and the power of surprise is discussed further with *megatrends, weak signals* and *black swans*.

## 2.2 MEGATRENDS, WEAK SIGNALS AND BLACK SWANS

Futures studies principles emphasise that all knowledge about futures is important, because even improbable scenarios help us to prepare for the surprises. However, the three categories of change I introduce differ from the probilities to become a reality and also from the opportunities to impact them. In this case, an architect can learn to be aware of the forces of change that will most likely to change their profession, but also prepare them for analysing and speculating emerging trends.

### MEGATRENDS

*Megatrends* are probably the most familiar futures research results to a variety of disciplines and to the public audience. One of the earliest significant examples of defining megatrends with systematic monitoring is John Naisbitt's megatrend analysis in United States of America during the late 20th century. Megatrends are detected and defined by analysing greater systemic changes in society and technology on a global scale. An example of such change is ageing population. Nonetheless, these trends can impact society in various ways in different parts of the world. For instance, The Finnish Innovation Fund Sitra and the Committee for the Future of the Parliament of Finland produce their own material studying the future from the Nordic perspective.

Megatrends shape our everyday lives and environments significantly. They have high probabilities to become reality and thus cannot be changed or influenced easily, if at all. A megatrend can consist of a phenomenon or multiple related phenomena with a clear, known direction of change which can be expected to develop in a certain way in the future. A megatrend is understood as a cohesively defined whole, even though it can include contradictions or surprises. (Mannermaa, 2004, pp. 45-46, 73, 85) The architectural reactions to megatrends can be seen for example in housing crisis, which stemmed from urbanisation. As seen in Figure 16, Walter Gropius's *Dessau-Törten Housing Estate* area (1926-1928) was a test site for developing mass-produced houses to provide quality living for as many people as possible according to the Bauhaus ideologies.



**Figure 16.** Walter Gropius, *Dessau-Törten Housing Estate,* 1926-1928.
Bauhaus promised quality of living to all by harnessing standardisation and industrialisation in architecture. The problems of the era, urban sprawl and housing crisis after the First World War, provided an opportunity to Bauhaus architects to reimagine the future with new values and new methods of designing. *Dessau-Törten Housing Estate* was first designed with five townhouse types for single families. Gropius experimented with construction and technological innovations with the houses in this area. (Siebenbrodt & Schöbe, 2012, pp. 274-275, 285-286, 289-290)

Megatrends can often be misinterpreted as definite predictions of the future. However, the future is shaped by our behaviour and decisions. Thus, megatrends can unfold themselves in reality in different ways. They do not promote one image of the future but can impact everyday life in various means. Being aware of these forces of change allows us to adapt and actively promote desired change instead of reacting to the changing circumstances. It is thus necessary to go beyond the buzzwords, which megatrends often become.

## WEAK SIGNALS

*A weak signal* is a phenomenon which is challenging the megatrends. It is temporal and unique in nature, without known history or significance in society before. It appears, becomes a trend or a megatrend or it disappears. Although weak signals do not have a known history, they do not emerge and develop in a void. They exist and evolve in the scientific, economic, cultural and societal environment. Weak signals are not easy to detect and often require systemic, rigorous monitoring or other methodological approaches to be observed and to be benefitted from. However, people, organisations and companies who are able to observe weak signals are believed to be in a better position to adapt and succeed in the future. (Mannermaa, 2004, pp. 113-114, 116-117, 121)

There has to be room for mistakes and misinterpretations when working with weak signals due to their ephemeral nature. However, they can be understood as a precondition for innovating something new and significant. Therefore, they have to be analysed from many different perspectives. (Mannermaa, 2004, pp. 116, 122) Weak signals thus emphasise the importance of alternative scenarios.

Dufva (2019) encourages to work with weak signals to spark the imagination and test their significance with following questions and thinking exercises:

What kind of world is the weak signal illustrating or describing?
What kind of contradictions or tensions there are compared to megatrends?

What kind of skills, knowledge or services are needed in the scenarios based on weak signals?
Describe the future person and their everyday life in a world defined by the weak signal.
What if- questions to expand the possibilities. (p. 36)

These questions allow one to create alternative scenarios, define significant consequences and find completely new aspects of the future. What if -questions are also suggested by architectural and design theorists to expand imagination to speculate alternatives and spark imagination for spatial visions and narratives (Dunne & Raby, 2013, p. 86; Till, 2009, p. 114). Thus, the architectural weak signals can be discovered and imagined with the tools of storytelling, for example.

## BLACK SWANS

What if the unimaginable, completely unexpected event happen? Nassim Taleb (2010) calls these kinds of phenomena *black swans*. A black swan is an event which changes and challenges the way we live and comprehend our lives completely. For example, the emergence of internet can be considered a black swan. However, trying to predict the unpredictable is an impossible task. (Taleb, 2010) Black swans are related to *bifurcation* and *chaos theory*. The idea of the state of chaos has been familiar already during the mid-20th century. Complex systems and chaos theory emerged from the field of mathematics during the 1960s and spread later to social sciences (Kamppinen, Kuusi & Söderlund, 2002, p. 272). Black swans demonstrate both the impossibility of predictions and also the importance of speculating and exploring the alternatives.

To sum up, the future can be mapped and learnt from, but surprises always occur. Adaptability, flexibility and willingness to learn and change are necessary skills for designers when designing for the future. The future-oriented design strategies embrace the uncertainty and take dependencies as an opportunity to raise discussion, debate, criticise the existing and vision transition. The next chapter explores the design approaches to change.

# 2.3 FUTURE-ORIENTED DESIGN

Two future-oriented design theories introduced in this chapter differ from their approaches to design practices. *Speculative design* harnesses the imagination to vision alternatives, which do not have to be completely feasible in the real world. It thus allows designers to step out from the optimistic presumptions and think unconventionally. *Transition design* emphasises the action, the plan for transition, and making well-informed decisions with long-term visions. Thus, speculative design allows more abstract level of design thinking, while transition design focuses on practical strategies to impact and initiate change. These both strategies encourage architects to use the aforementioned skills to produce knowledge by writing, talking and drawing. In addition, they encourage designers to think about the practice and the products critically.

## THINKING THROUGH DESIGN TO CREATE NEW ARCHITECTURE

Architectural theorist Petra Čeferin (2008) describes an architectural event as *an architectural epicentre,* when a new architecture emerges through the design process and practice. Epicentres have the potential to change the discourse of what we consider architecture and architectural practice (Čeferin, 2008, p. 14). Dunne and Raby (2013, p. 35) also emphasise the power of *thinking through design*, to make a conscious effort to use design thinking, tools, skills and processes to find new perspectives. The projects and practices which become significant forces of change in architecture are often overlooked at first and it can be even questioned whether they are architecture or not (Čeferin, 2008, p. 15). This kind of emergence of new architecture occurs on the thresholds of the discipline, and as such, they should be a part of the discussion of the future of architecture.

This vagueness and process of changing the discipline through undefined processes have many similarities with weak signals. Although Čeferin (2008, p. 23) reminds that the architectural epicentres cannot be planned or controlled, the strategies learnt from the futures studies and weak signals can prepare architects to observe these events. In addition, as acknowledged,
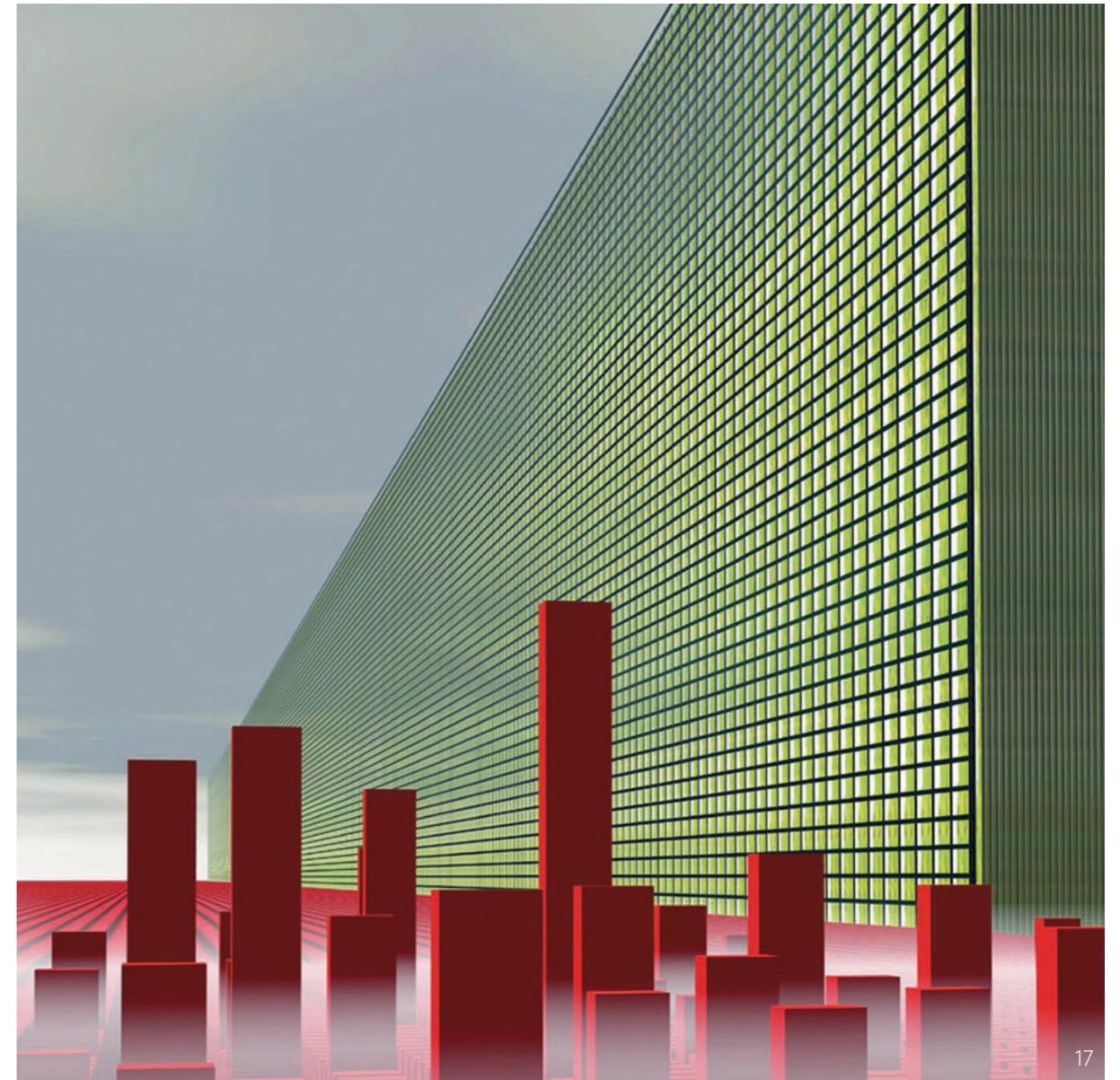


**Figure 17.** Winy Maas, Jacob van Rijs, Nathalie de Vries, *Metacity / Datatown,* 1999.
Dutch architecture office MVRDV have explored datavisualisation and urban spatial organisation in virtual realm. *Metacity/Datatown* is built upon metrics, numbers and information, the data. The project is not about designing a real, contextual city, but to generate multiple scenarios of the same set of data. The city plan is divided into sectors, such as living, agriculture and waste production.

contingent discipline is dependent on the outside forces and this offers an opportunity to translate societal, scientific and technological weak signals to architectural weak signals. The ephemeral nature of these signals require paying attention to knowledge which is produced by thinking through the design process. The acknowledgement of the importance of the new ways to think about architecture and architectural practice let us discuss the specific design theories which give us tools to approach the alternative scenarios.

## THE VALUE OF SPECULATIVE SCENARIOS

Speculative design can be understood as a strategy to generate alternatives and as a tool to critically examine the discipline and world around us. Dunne and Raby (2013, p. 44) joins the futurists by agreeing that critical design and generating alternatives are not blueprints for the future, but they offer perspectives to possible realities. The value of speculative design is in creating knowledge, sparking discussion and discovering new alternative scenarios. Speculative design is taking into account the values and ethics and is thus critical in nature. Design can be used to encourage citizens to participate and raise questions and debate on alternative futures, to harness collective imagination to speculate tomorrow. (Dunne & Raby, 2013, pp. 6, 160) The need for thinking about architecture on the thresholds of the discipline is important, because otherwise new solutions emerge just from the existing examples and knowledge (Čeferin, 2008, p. 20). The insights from futures studies emphasise the same understanding of limited and narrow perspectives.

Scenario-planning is partly imaginative speculation. Speculation requires a designer to imagine alternative reality, worlds beyond the existing circumstances (Dunne & Raby, 2013, p. 70). MDRDV's *Metacity/Datatown* (1999) is an example of a project which produces multiple scenarios of urban organisation with architectural tools, as seen in Figure 17. The contradiction between alternatives and problem-solving designing practices emerges, when we approach design and architecture with a speculative perspective. Practice based on problem-solving is focused on the possible, positive and optimistic design. Sometimes the design problem is narrowed even to the mere aesthetic organisation (Dunne & Raby, 2013, p. 2).
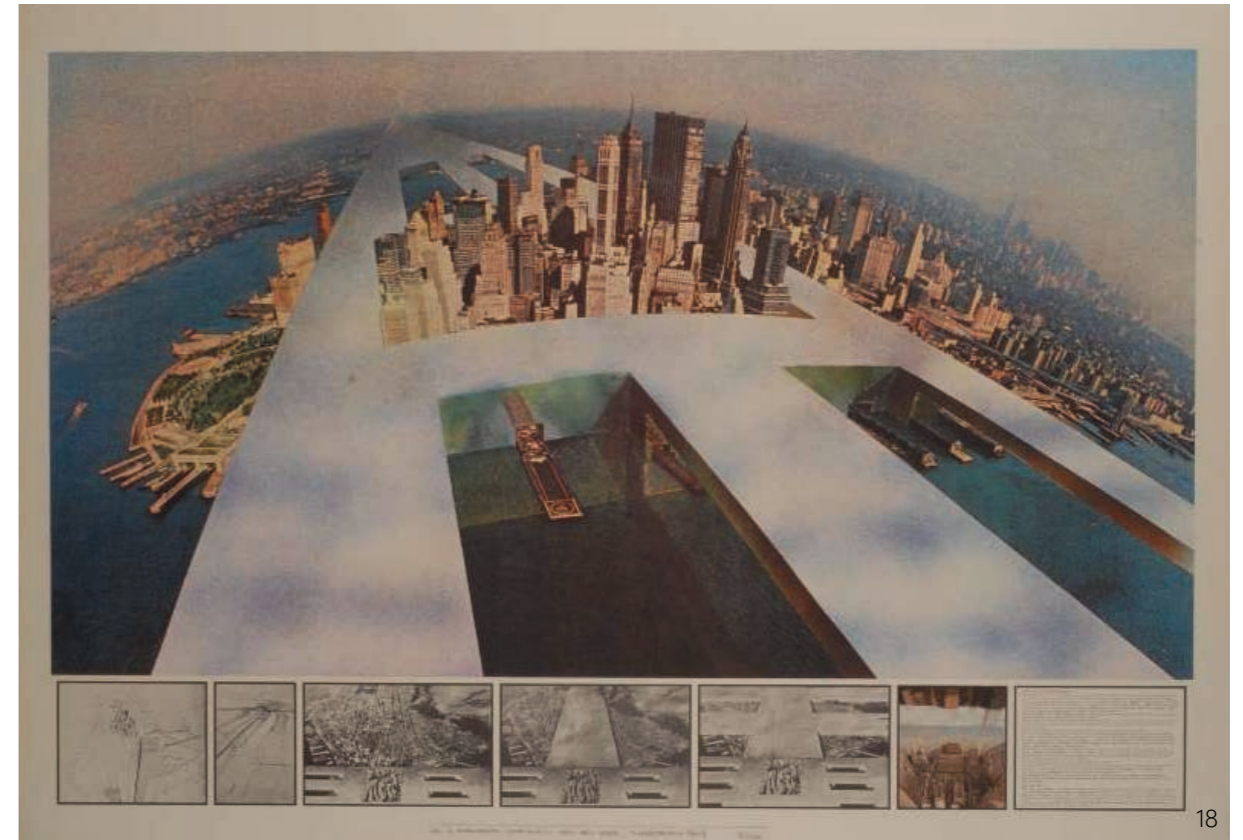


**Figure 18.** Superstudio, *New New York, from the project "The Continuous Monument",* 1969.

Superstudio's conceptual project *Continuous Monument* series (1969-1971) explores the extremes of total urbanisation. The ascalar architecture is based on cartesian grid, applicable for cities to furniture, connecting environments globally and in all scales neglecting the cultural and social contexts. The project was defined by the criticism toward modernist urban utopia and capitalist spectacle as a driving force in architecture and society. (Spiller, 2006, pp. 86-87)

However, futurists emphasise that knowledge is valuable, even if it is negative. This aspect is not always embraced in design fields, but it is not completely foreign either. Negative consequences compared to our set of values are important, because they question what kind of design is desired. Future is linked to the present and speculation becomes criticism when the present day is compared to a value system and possible changes in existing social structures are identified. Criticism in speculative design is thinking through design and questioning the basic assumptions of the design itself. (Dunne & Raby, 2013, pp. 3, 35)

Dunne and Raby (2013) describe an exercise which they have done with design students, where the students were asked to get familiar with an emerging scientific research area and apply it to a design product used in everyday life. This exercise revealed many contradictions and problems and offered thus a great insight into what a scientific or technological innovation can be when it is translated into everyday life through design. (Dunne & Raby, 2013, p. 57) This example demonstrates how thinking through design can be used to raise questions and identify existing contradictions when design is free from the optimistic imperative.

Dunne and Raby (2013, p. 38) explore the possibilities and positive uses of *dark design*, which is emphasising the representation of undesirable design solutions. This is where the spectrum of alternative scenarios are broadened to opposites. Art is allowed to be shocking, but the best dark design scenarios are so close to reality that they are plausible and thus disturbing, challenging and demanding. Furthermore, the negative aspects of life are part of the complexities of human nature and neglecting them by focusing on optimism and idealism can cause more problems than solutions. (Dunne & Raby, 2013, pp. 43, 45) The explorations on dark design space allow designers to approach what is a good design by understanding what ramifications poor design solutions have. It deepens the design knowledge and can lead into better solutions in the real world. Superstudio is one of the examples of the visionary architectural practice which have used the negative, even dystopian scenarios to criticise the society and practice of the time, such as in *Continuous Monument* (1969-1971) series, as seen in Figure 18.






**Figure 19.** James Hull, Whitechapel Gallery, *This Is Tomorrow,* 1956.
**Figure 20.** Museum of Modern Art, New York, *Visionary Architecture,* 1960.
**Figure 21.** Museum of Modern Art, New York, *Deconstructivist Architecture,* 1988.
**Figure 22.** Victoria and Albert Museum, *The Future Starts Here,* 2018.

Architectural futures, visionary and paper architecture, have been on display in exhibitions. Museums have provided a platform for debate, criticism and discussion on the relationship between design, architecture and society. Exhibitions as a medium for visionary architecture also allow retrospective reflections. Whitechapel Gallery has refered to its own history: exhibition *Is This Tomorrow?* (2019) discussed today's futures themes, but was stemmed from the same purposes as *This is Tomorrow* exhibition in 1956.

The visionary architecture and criticism needs a place to be on display, a platform where they can be discussed. As speculative design rarely is in a built form, exhibitions have been a crucial form of media for expressing and developing new ways to think through desing. As seen in Figures 19-22, couple of significant forward-looking exhibitions are Museum of Modern Art's *Visionary Architecture* (1960), *Deconstructivist Architecture* (1988) and Whitechapel Gallery's *This is Tomorrow* (1956). A recent example of exploring designed futures is *The Future Starts Here* (2018) in Victoria and Albert Museum and *Is This Tomorrow?* (2019) in Whitechapel Gallery.

## DESIGNING FOR TRANSITIONAL TIMES

The architectural alternatives become reality when a plan of action is chosen and created. The choice emerges once again. Design theorist Terry Irwin (2015) proposes transition design as a strategy to cope with the dilemma of short-term-oriented design and long-term visions. Transition design shares many similarities with futures studies and applies long-term future-oriented thinking to design practices. The transition design is *speculative in nature, lifestyle-oriented* and *place-based* but acknowledges the greater natural system. It focuses on long-term visions, but informs the short- and mid-term solutions.

Designing involves planning a chain of actions, which is aiming toward a certain change. Sustainable society requires changes at all levels of society. Transition design is based on everyday life (based on Lefebvre's *Critiques of Everyday Life*) and acknowledges the importance of change at the mundane level. This corresponds to contingency and understanding of time in architecture according to Till. Moreover, change is initiated in everyday environments, not top-down hierarchies driven by the consumer-led market forces. Fast-paced life, defined by consumerism, demands people to make decisions for short-term purposes while overlooking the broader perspective. A deep understanding of dynamics of change in the system is thus necessary. (Irwin, 2015, pp. 234, 238, 240) Hence, the linear time and cyclical time are both part of transition design. Future-oriented nature of the transition design project allows designers to imagine alternatives beyond the existing socioeconomic constraints and political paradigms. (Irwin, 2015, pp. 232-233)

Transition design framework consists of four parts which are connected to each other: *visions for transition, theories of change, mindset and posture* and *new ways of designing* (see Figure 23). The transition design process is self-learning and -evolving. Transition design project is future-oriented and the vision for transition is used to shape its development. Irwin (2015) considers the meaning of a vision similar to the futurists; visions are not blueprints, but open-ended and speculative guidelines which allows errors, relearning and iteration. (Irwin, 2015, pp. 232-234). It responds to assumptions and understandings of time in futures studies. The design problem is an on-going process, where temporary solutions are accepted if they aim for longer-term solutions. The vision defines preferable routes from forking paths from the present moment to the possible futures. Thus, the visioning process is iterative and evolving when the values change.
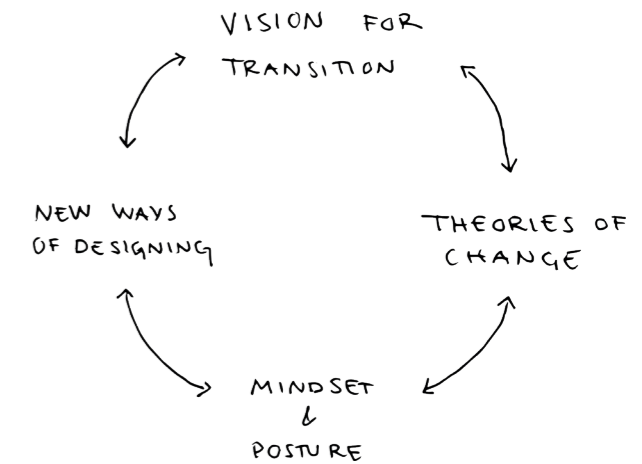
**Figure 23.** Transition design, After Irwin, 2015, is an iterative process.

Theories of change in transition design embraces the alternatives and the knowledge about change and future. These theories are described as a multidisciplinary and evolving pool of knowledge which requires designers to adopt an attitude of a lifelong-learner (Irwin, 2015, p. 235). For the theories of change in transition design framework, I thus propose futures studies as a resource for gaining the knowledge about the dynamics of change.

Transition design sets designer's mindset and posture, their value system, into a closer examination, much like in the futures studies' approach to choice. Transition design takes into account that as design is a contextual practice, values, worldview and posture have an impact on what we consider a design problem and how we frame it. Understanding of different value systems can be broadened by collaboration and gaining multiple views to see the design problem more holistically. Transitional times require self-reflection, open-minded attitude and interaction. (Irwin, 2015, pp. 232, 235)

New ways of designing are informed by the vision, knowledge and insight gained from the theories of change and driven by mindset and posture.

These design methods are iterative interventions, adaptive, flexible, self-learning and self-organising processes which require commitment. (Irwin, 2015, p. 237) Transition design is thus acknowledging the contingent nature of design practices.

The fundamental difference to conventional models of one-dimensional problem-solving is that an intervention can be temporary, and iterative, but is informed with long-term vision (Irwin, 2015, p. 237). The temporal nature can be seen as an advantage for achieving greater results in the future. Thus, the design problems themselves are reframed. Inayatullah's strategy of alignment is useful for this exercise of framing the problem and its connections in the first place. Transition design inherently emphasises the process rather than the end-product. Furthermore, architecture as agency in the contingent world and as a contingent practice is focused on the process instead of the object (Till, 2009, pp. 146-147).

Transition design is based on the assumption that change can be ignited with design and these interventions are needed in order to shift toward a sustainable society. Dufva (2020) argues that the most important megatrend of our time is *ecological rebuilding*. Although the transition design framework could be used just as a design strategy for transitional times in general, the current circumstances propose sustainable development as a relevant vision for transition design.

## AGENTS OF CHANGE

Theories of change include strategies and offer understanding of change with time, alternative scenarios and choice, but the change itself is initiated by people who implement the strategies and make the choices. The futurists and design theorists overwhelmingly agree that change is often in the hands of creative, innovative and imaginative people who are able to catch, listen and observe change when it is just about to emerge. They have the courage to explore unconventional ways of doing things and are able to inspire others. Masini (2006) describes people with *''capacity to listen, to search, to be attentive to that which already exists, but which is not yet obvious and may*

*develop later''* (p. 1163). Irwin (2015, p. 236) considers designers who apply transition design strategies as *agents of change*. Inayatullah (2008, p. 11) identifies *a creative minority* who are able to adopt new ways of operating and inspire others to do the same when the existing modes of working are no longer an option.

Specialists or experts are not always best to judge how their innovations will impact the society, because their perspective is too detailed and too narrow (Mannermaa, 2004, pp. 118-119). The intuitive, imaginative and creative part of architecture could thus be an asset in the changing world. Architects are able to imagine and vision something abstract with concrete terms with an inherently generalist perspective.

Till (2021, p. 33) raises the question of *architecture after architecture*, meaning the position of an architect and architecture in society, when the existing models of practice are not working or possible. Are architects becoming *spatial agents* or *spatial activists*? Harriet Harriss, Rory Hyde and Roberta Marcaccio (2021, pp. 9, 14) regard the role of an architect as *a mediator* with a flexible mind, which is more useful one for solving today's complex problems. The architects of the future are able to experiment, to guess, to propose and hypothesise tomorrow freely and approach designing as an experiment and just a beginning (Čeferin, 2008 p. 18-19). They have the open, purposeful, humble and curious attitude and are able to imagine new spatial futures without forgetting the social and ethical dimensions of architecture (Till, 2009, p. 195). The process approach, which transition design proposes, is promoting the iterative, open-ended practice which changes the problem-solving imperative.

Harriss, Hyde and Marcaccio (2021) sum up the position and the role of a architect in the changing, contingent world:

*"The most effective architects are not those who seek to control every detail, but who are open collaborators in a productive process. They are professional generalists, who know a little bit about a lot of things, able to ask the right questions to get the best out of a team. They are good hosts, able to invite the right people around the table, in order to better define the brief, and to consider it from multiple perspectives. They are synthesists, able to process this often contradictory information, to satisfy multiple goals and stakeholders. And they are propositional, able to transform this raw material of people, perspectives and ambitions into an actionable vision for the future, something which can spark excitement, garner support, and show the way forward. They are microscopes and macroscopes, able to operate at the scale of a glazing detail, at the scale of the city, and all that lies between."* (p. 9)

Futures studies, transition design and speculative design encourages an architect to shift perspectives when observing the world, the discipline and the design problem. I follow the logics of Sarkis, Salgueiro Barrio and Kozlowski and suggest further questions:

**How do futures shape architecture?**
**How does architecture shape futures?**
**How do architects change architecture?**
**How does architecture change architects?**

## 3.0 CHANGING ARCHITECTURE

This chapter introduces four categories exploring the themes of change in future architecture: (De)Growth, Power & Economy, Ageing Population and Sneaky Greens & Engineered Nature. I have gathered a pool of information relevant for architecture from the field of futures studies, and organised phenomena suggested by the megatrends and weak signals in the aforementioned thematic categories. Furthermore, I am introducing future-oriented architectural projects which are based on the phenomena and themes discussed.

I have defined a set of criteria for judging what is relevant for the purposes of this thesis:

The phenomenon has to be defined in some way in the futures studies references.

The phenomenon is relevant and interesting from the architectural point of view.

The phenomenon includes contradictions, which raise questions, opportunities and challenges.

The phenomenon offers architects a chance to impact the future environments.

The phenomenon has a potential to change the way architecture is designed and how architecture is practised.

The phenomenon reveals something surprising or challenging about the nature of architecture.

The impacts of the phenomenon are not expected to take place only in the distant future, but instead the changes and decisions are relevant for the near future.

# (DE) GROWTH

OSLO ARCHITECTURE TRIENNALE 2019 ENOUGH: THE ARCHITECTURE OF DEGROWTH

COUNTRY SIDE, THE FUTURE

R-URBAN

UPCYCLE STUDIOS

KRISTIINANKAUPUNKI

TALSINKI/HELLINNA

CITTA SLOW

MULTILOCALITY

SLOW LIVING

ESSENTIALISM

MINIMALISM

LOANING

SHARING

RENTING

REPAIR CAFÉ

MAKERSPACE

PARTICIPATORY DESIGN

CO-DESIGN

CIRCULAR ECONOMY

SERVICIFICATION

CROWDSOURCING

OPEN DATA / OPEN-SOURCE

DIGITALISATION

# POWER & ECONOMICS

ROTOR DC

WIKIHOUSE

ASSEMBLE

RESOURCE ROWS

THE GANTRY

KALASATAMA

DESIGN EARTH

MAKING FUTURES SCHOOL

ISOLATION, CHRIS PRECHT

AI

IoT

DIGITAL TWIN

NFT

BLOCKCHAIN

DEMOCRATISATION

AUTOMATISATION

MaaS

SMART CITIES AND BUILDINGS

ROBOTISATION

# SNEAKY GREENS & ENGINEERED NATURE

HYDROPONIC CULTIVATION

BIODIVERSITY

EXPERIENTIAL SPACES

DIGITAL FABRICATION

4D-PRINTING

3D-PRINTING

NEW MATERIALS

GROWN MATERIALS

BIOMIMICRY

BIOLOGISATION

NBS

GREENEST OF THE GREEN

HIGH LINE

HIDAKA OHMU

OKI NAGANODE

FLAT HOUSE

SILK PAVILION

SHIMMERING WOOD

HY-FI

THE WADDEN SEA CENTRE

# AGEING & DIVERSIFYING POPULATION

SUPER-ELDERS

ACTIVE AGEING

INTERGENERATIONAL CITY

NEW GROUND COHOUSING

THE ALZHEIMER'S VILLAGE

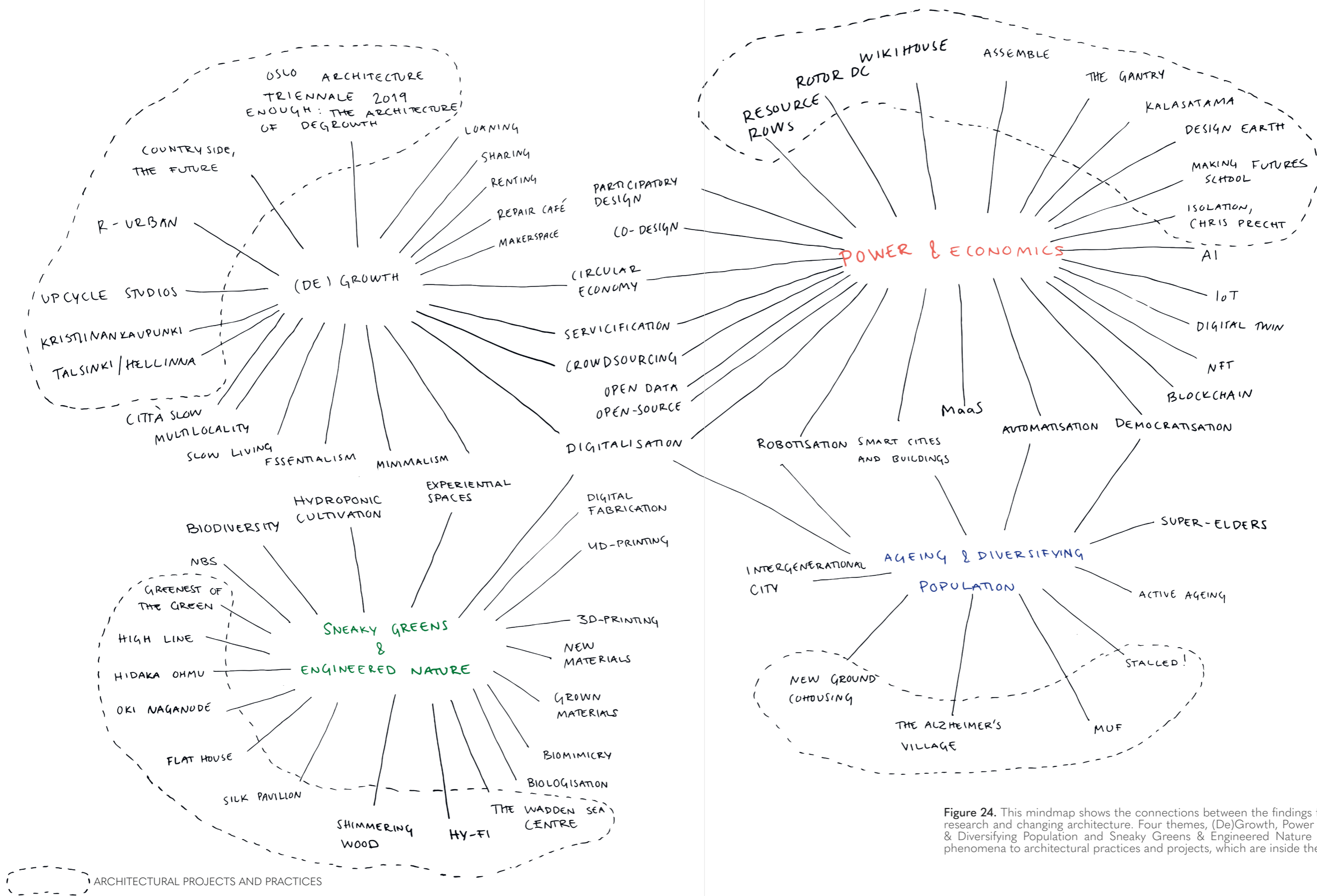MUF

STALLED!

ARCHITECTURAL PROJECTS AND PRACTICES

**Figure 24.** This mindmap shows the connections between the findings from futures studies research and changing architecture. Four themes, (De)Growth, Power & Economy, Ageing & Diversifying Population and Sneaky Greens & Engineered Nature connect the future phenomena to architectural practices and projects, which are inside the dashed lines.

## 3.1 (DE)GROWTH

*Degrowth* as a broader theme is relevant for the built environment. Not only the limited material resources need to be used efficiently, but degrowth in lifestyles changes the way we use, move and live in buildings, cities and territories. The report *the Limits to Growth* for the Club of Rome has warned about the consequences of uncontrollable growth, including the variables of population, agricultural production, natural resources, industrial production and pollution in the world system (Meadows et al., 1972). André Groz has introduced the idea of degrowth (*décroissance*) in economics during the same year the report was published in 1972. The concept of degrowth has been later adopted by social movements, eco-activists and urban sprawl critics during the early 2000s, for example. However, contemporary use of the term refers to the problematic relationship between capital growth and environmental crisis. The material degrowth aims to decrease the use of virgin material resources while the social degrowth can be applied in lifestyle choices. It is also noteworthy, that degrowth is a matter of democracy, justice, economy and ecology. (Demaria et al., 2013, pp. 195, 193-199, 206) The degrowth strategies are more relevant than ever, when limited resources force the society to adapt at an accelerated pace.

*Circular economy* has been suggested as an alternative for the current economic system, because it allows growth from degrowth. Sharing, renting, leasing, recycling, upcycling and repairing all aim toward no material waste and using minimal amounts of virgin material. Circular economy can be applied to business models and services to increase efficient use of existing building stock. (Dufva, 2020, p. 46; Finnish Government, 2021, p. 26) The economic model introduces the degrowth mindset already in territorial scale in land use and town planning by allocating local food production and transportation services in urban areas (Finnish Government, 2021, p. 70).

Degrowth thinking extends to lifestyles. *Minimalism, essentialism, slow living, silence retreats* and *mindfulness* are all parts of an increasingly popular phenomenon of slowing down the pace of busy life in the Western countries. Weak signals suggest that the need for taking control over technology and being able to go offline is becoming a compelling idea for many city dwellers

when ownership and consumerism are becoming less and less important because of sharing economy and servicification (Dufva, 2019, pp. 20, 32). Changes in everyday lives of individual citizens need to be implemented widely to meet the requirements of slowing down the uncontrollable growth. Living, transportation and food production constitute most of the annual carbon footprint of an average Finnish citizen and are thus in need of urgent change (Lettermeier et al., 2019, pp. 28, 68). Architecture operates in these categories by designing everyday environments, and has a potential to support sustainable lifestyles not only with material, but also with spatial organisation.

Emerging *off-grid* and *micro-grid* energy solutions provide an opportunity to live outside of electricity, water and road networks and still have the comforts of a city dwelling (Linturi & Kuusi, 2018, pp. 353-354). These technologies offer opportunities to live almost anywhere. Slower lifestyles and increased mobility encourage city dwellers to spend time in the countryside and different locations, even across countries. Especially the mobility inside of the European Union has increased the multilocal working and living (Haukkala, 2011, p. 34). *Multilocality* is challenging the megatrend of urbanisation. Voluntary multilocal living is turning into a new lifestyle. Working remotely allows people to stay longer periods of time in the countryside. The time spent on recreational residences will most likely increase, because owning a cottage and working remotely is more common among the group of urban dwellers. (Pitkänen & Strandell, 2018, pp. 12, 16)

Multilocality as a lifestyle can stem from a degrowth mindset, from a desire to pursue a slower pace of life even temporarily, but the reality can prove to be problematic. Increased mobility between cities, countryside and even countries create new challenges: increased traffic and empty apartments and offices do not promote ecological sustainability. (Haukkala, 2011, p. 41). The separation between busy megacities and shrinking sleepy villages can be a misleading image of the possible futures. Self-sufficient living in urban neighbourhoods and a more centralised urban-like activity in rural areas or shrinking cities may become common. (Dufva, 2020, pp. 24-25) Thus, the future architecture might be located in urban, rural or locations in between and share strategies.

The focus on capital growth seems to be unsustainable when we are reframing the concept of the growth itself. Oslo Architecture Triennale 2019, *Enough: The Architecture of Degrowth,* questions whether the endless capital growth has actually been done at the cost of social and cultural growth. Moreover, architecture of degrowth could be based on sharing, community, exploration, experimentation and generating alternatives in and for the future. One of the curators, Maria Smith, states a fundamental question: *"Could a society without growth not only support us, but also radically improve our lives?"* (Oslo Architecture Triennale, n.d.-a; Oslo Architecture Triennale, n.d.-b). The institutions of degrowth promote sustainable lifestyles and circular economy by setting sharing economy and the power of collective imagination into the centre of the process of shaping and impacting the future.

## DEGROWTH INSTITUTIONS AND SOCIAL GROWTH

How can we design growth from degrowth? Architecture defines the spatial hierarchies, design the everyday environments and thus is in direct connection with the cultural and social aspects of citizens' lives. Perhaps the existing practice, where the client is often holding the monetary power, forces architects to serve used futures by operating within the financial framework instead of social. Thus, degrowth thinking in architecture suggests that the role of an architect should shift more toward the civic. Oslo Architecture Triennale 2019 exhibition has been organised according to the institutions of degrowth: *The Library, The Theatre, The Playground* and *The Academy* (Oslo Architecture Triennale, n.d.-a). These are great examples to analyse what is future architecture based on cultural and social growth. Fundamentally, degrowth in architecture seems to aim for increased life quality without neglecting environmental responsibility. Spaces for sharing, experiencing, entertaining, playing and educating are meaningful places to start designing growth from degrowth.

*The Academy* represents the importance of democratisation of knowledge in trying to fight against inequality and injustice, where the space educational institutions provide, play an important role for these purposes. As a platform in the exhibition, *the Academy* encouraged practitioners, students and academics to rethink and bring new ideas on the table to discuss what is the future architecture of degrowth. This platform extends to the digital realm with an essay series *Overgrowth* available online. (Oslo Architecture Triennale, n.d.-c) As seen in Figure 25, design office Mill & Jones have contributed in the exhibition with a illustrated visual essay exploring the degrowth futures in urban realm.

The shared space, knowledge, goods and services define *the Library*. *The Library* evolves with society, sharing what needs to be shared, like ideas or household equipment. Thus, sharing and community are central degrowth concepts. (Oslo Architecture Triennale, n.d.-d) Imagining, exploration, alternatives, reality and fiction, invention and possible futures describe the significance of *the Theatre*. It encourages people to participate and imagine alternative urban futures through art performances and events. *The Theatre* acknowledges that the lived environment exists in collective urban imaginary where new futures can be created. (Oslo Architecture Triennale, n.d.-e) Rimini Protokoll used the theatre in their performance *Society under Construction (State 2)* to explore degrowth architecture in the Oslo Architecture Triennale 2019, as seen in Figure 26. Experimentation through play is a powerful way to learn and frees one to imagine architecture beyond the capital growth (Oslo Architecture Triennale, n.d.-f). *The Playground* is space for exploring alternative architecture through play.

All of these platforms emphasise the collective imagination, the ability to learn, experiment and create with playing, sharing, discussing and participating. These institutions are closely related to everyday environments, which corresponds to the sustainable lifestyles futures research suggest to be applied in all levels of society. It is remarkable that these strategies are focused closely on the well-being of citizens and the community. They try to enhance the quality of life instead of trying to use degrowth as a strategy to decrease or minimise something. The production of knowledge, ideas and alternative scenarios create the foundation of growth for degrowth futures.

The degrowth strategies inherently are about searching for alternatives to offer choices for citizens. If I consult the design theorists Dunne and Raby again, the lifestyle choices and offering alternatives is the duty of design

WHAT IF WE DESIGNED SOCIAL
AND CULTURAL GROWTH FROM
MATERIAL AND CAPITAL DEGROWTH?

EXPLORING
ARCHITECTURE
AND DEGROWTH
WITH THEATRE
↓



SPECULATING
FUTURE WITH
FICTION



**Figure 25.**   Mill & Jones, *Exile's Letter,* 2019.
**Figure 26.**   Rimini Protokoll (Kaegi), *Society under Construction (State 2)*, 2019.

Oslo Architecture Triennale 2019 explored the narratives of degrowth with visual essay
like Mill & Jones' *Exile's Letter* and with theatre like Rimini Protokoll's performance
*Society under Construction (State 2),* for example.

3.1 (DE)GROWTH

disciplines. That requires trusting the judgment of a citizen. The institutions of degrowth are in alignment with the power of practice as a tool for developing, discussing and debating what architecture is and should be. As Čeferin suggests, the new architecture emerges from the process of design, while Raby and Dunne encourage designers to think through design. The degrowth institutions are for sharing knowledge, to inspire and discuss, to explore with playing and imagination. They represent the process of the emergence of the new architecture.

## R-URBAN AND BOTTOM-UP INITIATIVES

The architecture of degrowth suggests that the focus of the architectural practice should be shifted toward the civic areas of life, but how is this approach managed in reality? *R-Urban* is an example of a project which is rooted in the well-being of a community. The project is supported by architecture offices Public Works and Atelier d'Architecture Autogérée. I am hesitant to use the words *design by*, because these words suggest some sort of creative authorship of the project. The *R-Urban* initiatives in Hackney Wick, London in United Kingdom and Colombes in France are defined by collective efforts and imagination. Rather than being a merely material architectural object, it is a whole ecosystem or network of different pilot projects, facilities, ecosystems for sharing and communal efforts to create more sustainable, social and active urban neighbourhoods. Thus, the *R-Urban* projects are rather supported by the aforementioned architecture offices. The role of an architect differs from what the traditional logics of the practice suggest, where the starchitect is often publicly celebrated.

As seen in Figures 30-32 *R-Urban* initiatives are a hive of different activities and projects like community gardens, pilot projects, recycle hubs, makerspaces, residences for researchers and designers, prototypes of plant-filtering systems, training programmes, facilities made from reused containers and prefabricated wooden huts, co-working spaces as well as events like talks, to mention but a few (Petrescu, Petcou & Lang, 2015, pp. 19, 33-34, 38-39, 61, 64). The degrowth institutions Oslo Architecture Triennale 2019 defines can all be discovered in the *R-Urban* hubs. Talks, discussions and training

programmes are for sharing knowledge and ideas, like in *the Academy*. The commons, facilities and spaces are shared like in *the Library*. The events allow people to imagine and speculate collectively the future, like in *the Theatre* and the *R-Urban* sites give the members of the community a space to create, learn and play, like in *the Playground*.

Architect's role is an active initiator, facilitator, mediator and consultant in *R-Urban* projects where the transformation is not only physical, but requires social and political involvement (Petrescu, Petcou & Lang, 2015, p. 7). The role depends on what is needed in order to develop the area according to the desires of the community. It challenges the architect's role when the monetary or the political power is not on an architect's side. It requires a different way of thinking and searching for solutions outside of the logics of the mainstream architectural office culture. The vision is stemming from the local place and from the collective imagination instead of a given top-down brief from political authorities or creative architect teams who are commissioned to create a regeneration plan. Architects consciously choose to serve citizens rather than someone holding the monetary or political power. Thus, the assessment of the values responds to the theories of change emphasising the conscious, well-informed choice.

*R-Urban* is focused on everyday life where citizens are collaborating and participating actively to designing, visioning and building processes (Petrescu, Petcou & Lang, 2015, pp. 7, 10). In fact, the design brief is defined by the inhabitants rather than the city officials, land owners or developers. When site and studio are the same place, the proximity allows an architect to test alternative roles (Public Works & Davies, 2021, p. 102). An architect is part of the community, working from inside the neighbourhood and building and developing the initiative together with the community. The position also provides an opportunity to include political and social tasks to architectural agency. The client is the end-user, the visioner and even the builder. Both freedom and new problems emerge when the client is not the stakeholder who has the power of money or political authority. The *R-Urban* teams have had to deal with difficulties with city officials, who have not seen the value of the projects (Petrescu, Petcou & Lang, 2015, p. 54).

WHAT IF WE HAVE MISUNDERSTOOD
THE RELATIONSHIP BETWEEN
THE URBAN AND RURAL?
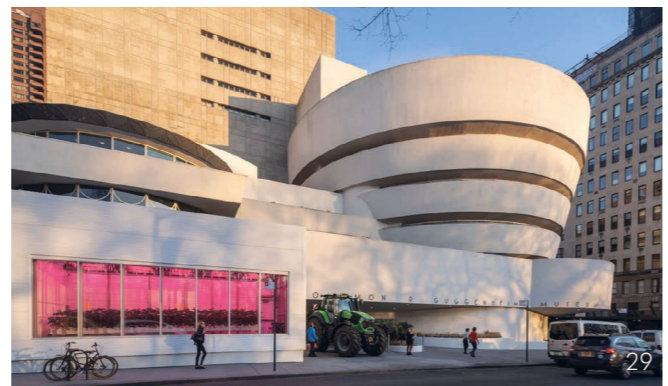




RURAL VISITING
NEW YORK



RURAL STRATEGIES
IN URBAN SITE




**Figure 27-29.**  Rem Koolhaas and Samir Bantal, *Countryside, The Future*, 2020.
**Figure 30.**  Atelier d'Architecture Autogérée & Public Works, *R-URBAN COLOMBES*, 2012.
**Figure 31.**  Atelier d'Architecture Autogérée & Public Works, *Green Wall, Green Roof and Drip Irrigation*, 2016.
**Figure 32.**  Atelier d'Architecture Autogérée & Public Works, *RECYCLAB*, 2012.

AMO, Atelier d'Architecture Autogérée  and Public Works have studied the connection between the rural and urban.

The bottom-up, non-profit initiatives have to find different economic models for funding the projects. *R-Urban* is based on economics of commons, gifts, collaboration, circularity and share, non-material and material exchanges. The initiatives also gain revenue from small rents from spaces and sold products. (Petrescu, Petcou & Lang, 2015, pp. 22, 59) The limited financial resources forces architects and other stakeholders to find alternative ways to create urban spaces. *R-Urban* projects take advantage of unoccupied spaces and buildings and have been able to negotiate free temporary, short-term use, which requires built hub facilities to be easily transportable and removable (such as shipping containers). The projects do not target specific scales due to the uncertain and iterative nature of the initiatives. It requires one to look at what exists and start from there to build new urban spaces and speculate urban futures. *R-Urban* networks are not tied to one scale, but they also vision European wide network of hubs which could share the knowledge although operating locally at the neighbourhood level. (Petrescu, Petcou & Lang, 2015, pp. 18, 21, 52, 72-73)

The *R-Urban* strategies learn from the history of architectural theory, like the garden city, regional city and transition town movements to imagine and create urban futures, but try to be informed on what strategies worked and where they failed (Petrescu, Petcou & Lang, 2015, p. 21). This project is thus aware of the heritage, but actively pursues changes through learning and keeping the process open-ended. *R-Urban* images of the future speculate collectively the radical changes and transition toward a sustainable society. The aim is to give citizens local places and opportunities to impact on planetary challenges in everyday environments (Petrescu, Petcou & Lang, 2015, pp. 92-93, 96), which corresponds to Dunne and Raby's thoughts about the designer's role as a provider of alternatives.

It is difficult to define what in this project actually is architecture or architectural practice. However, I find that to be the most interesting aspect of the *R-Urban*. The changing roles of an architect is exactly a topic stemming from that sort of thresholds of architecture which is discussed in the theories of change. Is it the complex nature of changing roles, where the future architecture emerges?

## COUNTRYSIDE, THE FUTURE AND THE RURAL POSSIBILITIES

*R-Urban* can be also considered a degrowth thinking where rural strategies are applied in urban context. *R-Urban* refers to different sustainable strategies aiming to promote resiliency, such as *reducing, reusing, recycling, repairing,* and *re-designing*, but also applying rural practices and skills in urban context (Petrescu, Petcou & Lang, 2015, pp. 7, 10). The discussion of the tension between the urban and rural has been changed throughout the history of architecture from modernist urban utopias to escapism the countryside can provide. Urbanisation as a megatrend has emphasised designing and developing urban areas for decades and assigned the cities as a site for an architect. Urbanisation has drawn the attention of architects closely into urban areas to solve the problems of and with density, but could ruralisation challenge those assumptions? Rem Koolhaas and Samir Bhantal from the think tank AMO of Office for Metropolitan Architecture (OMA) have explored the innovative, forward-looking existence and possibilities of the rural in the exhibition *Countryside, The Future*, at the R. Solomon Guggenheim Museum in New York in 2020 as seen in Figure 27.

The resiliency can be promoted by rural strategies in cities, such as urban cultivation. On the other hand, the urban strategies of regeneration can be applied in rural areas. Thus, the question is not anymore whether the urban or rural is more interesting or needs more development, but the fascinating area is in the interfaces between them. The whole exhibition is a bold statement itself. The rural is brought to the heart of skyscrapers and the busy streetlife of New York City, as seen in Figure 29. The exhibition showcases the tensions and contrasts and represents the rural in a different light. Hydroponic cultivation, high-tech agricultural solutions, industrial farming, robotics and drones are mixed with the rich history of the countryside from ancient Roman and Chinese cultures to the wellness industry of today. The rural is a matter of territorial politics but also a territory for experimentation. The exhibition text by Koolhaas argues that new ways of thinking about planning, inhabitation, owning and renting are emerging in the discussion about the rural. (OMA, n.d.)

*The Countryside, The Future* also introduces urban rationalism with the cartesian grid, which can be found from the countryside in industrial agriculture with rectangular plots, buildings and allocation patterns (see Figure 28) (OMA, n.d.; The Solomon R. Guggenheim Foundation, n.d.). The abandonment of the contradictory approach of urban and rural offers new ways to think both of them. On the other hand, the rural can be seen as an agile site for experimentation of urban kind of functions and spaces, like communal centres and hubs. The debate between urban and rural seems irrelevant in this light.

## SLOW LIVING AND URBAN LIFE

The degrowth lifestyle choices of slowing down the pace of busy life are gaining momentum. *Slow living* as a lifestyle seeks to increase the quality of life by finding pleasure in the mundane and creating a sense of abundance of time by slowing down. Slow living as an alternative image of the future is compared to a fast-paced lifestyle dominated by globalisation and consumerism. The spaces and places of slow living cannot be described in concrete terms although some environments can facilitate slow living better than others. Physical withdrawal from busy, often noisy spaces to calm and quiet places, at least temporarily, offer an opportunity for pondering and reflection which are central activities for slow living. Even small parks can offer a sense of withdrawal. These kinds of places are focal points in the flux of everyday life. (Craig & Parkins, 2006, pp. 3, 5, 62-63, 65, 78)

Till (2009) states: ''*architecture that neglects everyday is neglected everyday*'' (p. 140). In contrast, the emphasis on everyday opens up the possibility for architecture to intervene into the slow living lifestyle by creating slow spaces. Home represents stability where careful attention is paid to aesthetic and material aspects of the environment. Urban spaces like piazzas, townsquares and marketplaces are described as spaces for slow living because they are destinations where people gather to spend time, unlike shopping centres. (Craig & Parkins, 2006, pp. 65, 78) Marc Augé (2008) calls acontextual places like airports and shopping centres detached from history and local culture as *non-places*, which Craig and Parkins (2006, p. 78) consider not to be

appropriate spaces for slow living. For an architect who aspires to create social and cultural growth with architectural interventions, this comparison is an essential observation. Degrowth in slow living creates growth by increasing the quality of life by slowing down the pace of life. Slow spaces can be designed intentionally and purposefully.

Slow living lifestyles extend to the scale of a city. *Slow City, Città Slow* movement, originating from Italy, aims to reorganise city life around a slow living lifestyle valuing life quality, the local identity and well-being of the residents. Some of the strategies from the movement have been adopted by larger cities as well, such as reducing the traffic in urban centres with car-free days and permanent planning solutions. The movement is defined by the governance, organisational and political forces, like *the Città Slow Charter* requirements, including the areas of urban planning, technology, the environment, tourism, business, agriculture and public health, which need to be met for an acceptance of membership. The policies aim toward increasing the quality of life in the city, but also standardise the slow city movement, communities and urban areas. (Craig & Parkins, 2006, p. 79). Slow living on a scale of a city is thus a conscious choice from the authorities for the community. The lifestyle choice is not necessarily made on the individual level as in *R-Urban* projects. Kristiinankaupunki is so far the only *Città Slow* member town in Finland (see Figure 36).

The population of the *Città Slow* membership city is limited to 50 000 inhabitants. In addition, the *Città Slow* cities have a close connection to the surrounding rural areas, because they emphasise the local agricultural production. Thus, market places and local restaurants are the focal points of slow living in towns and cities. (Graigs & Parkins, 2006, pp. 78, 81, 83) Celebrating the local, slow pace of life and mellow atmosphere can be considered as an attractive quality from the perspective of tourism.

Slow living can be contradictory. The cyclical time frame of everyday life is focused on stability and permanence, but the slow living lifestyles can be extended to many physical spaces between cities, countryside, homes and public spaces. The mobility between the places of slow living is in a constant state of flux. The countryside as an extended home is an integral

WHAT IF CHANGING LIFESTYLES
BLURRED THE LINES BETWEEN
THE ZONES OF LIFE?
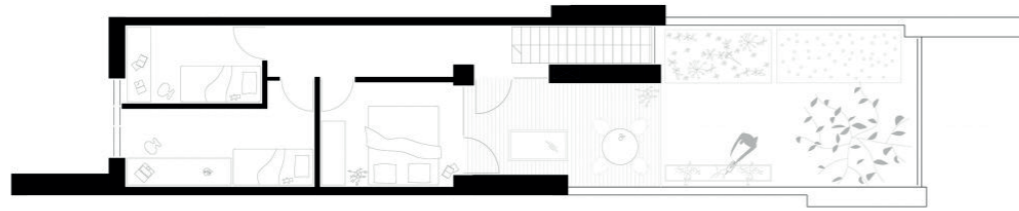


↖
FLEXIBLE
FLOOR PLANS

33

← TWIN CITY



CITTÀ SLOW
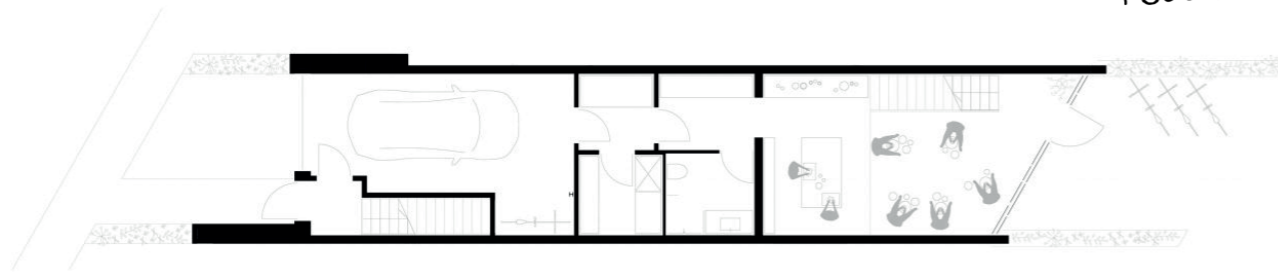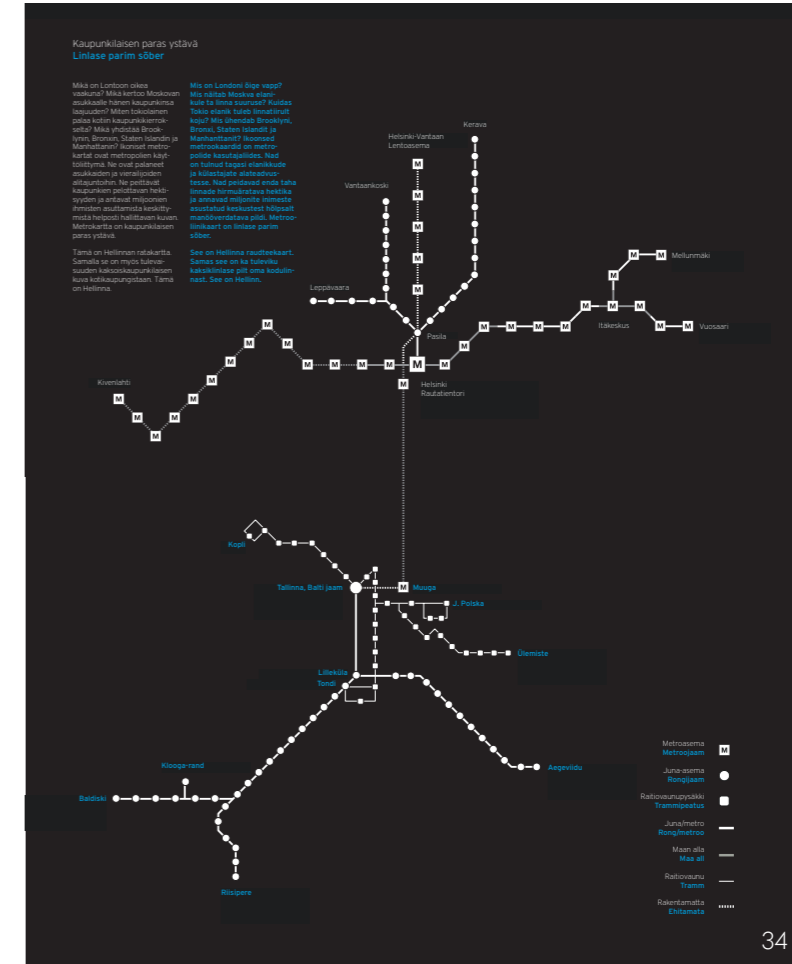


**Figure 33.** Lendager, *Upcycle Studios,* 2018.
**Figure 34.** Demos Helsinki, *Talsinki-Hellinna,* 2009.
**Figure 35.** Kristiinankaupunki, n.d.

The lifestyle choices can impact the built environment from the scale of an home to even international connections between cities.
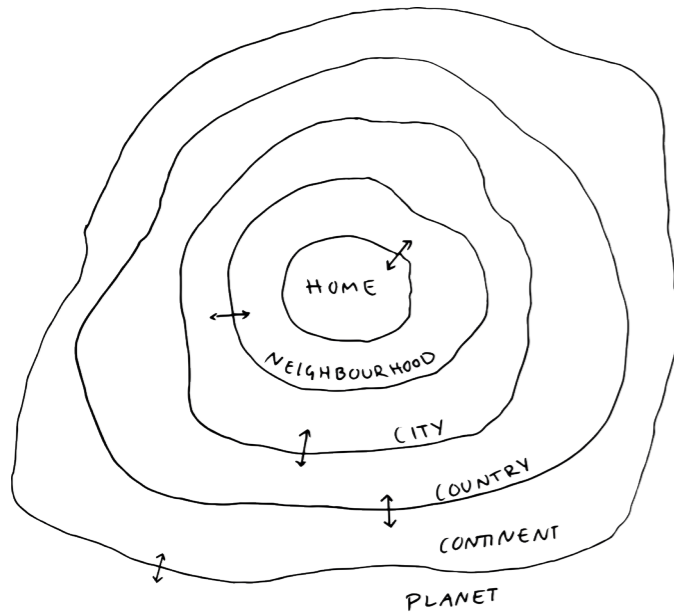
**Figure 36.** Zones of life expands from home all the way to the planet.

part of Finnish culture and it can be argued that the cottage culture is a slow living strategy. However, as the futures studies research suggests, the lifestyles of slow living can increase the multilocal mobility. Haukkala (2011, p. 7) describes the lived environment as zones with expanding radiuses from home to neighbourhood to city and further as seen in Figure 36 where multilocality is the back and forth movement between the zones. The dilemma is that an architect designs everyday environments, but the concept of everyday environment is expanding, when the zones of home, work, public spaces and even territories become blurred. Multilocality as a future phenomena challenges urbanisation and thus creates new possibilities but also problems to architectural practice.

## TALSINKI/HELLINNA, UPCYCLE STUDIOS AND LIFESTYLES IN ARCHITECTURE

The multilocal lifestyle is defined by connectivity. *Talsinki/Hellinna* (2009), as seen in Figure 34, is a vision by think tank Demos Helsinki, which explores the connectivity between speculative future twincity of Helsinki and Tallinna. The project is the earliest example in this thesis, but is still a relevant topic today. The idea pops up every now and then in news headlines with a vision of a hyperloop connection, the railway tunnels or with new investors. On a territorial scale, the tunnel connects Finland to central Europe. The social innovation of dual citizenship is created by connecting Tallinna and Helsinki with a tunnel. Multilocality in this vision is international. The everyday environment is expanded with the social innovation of dual citizenship of the twincity (Mokka et al., 2009). The shared public transport system changes the urban mobility and fuses the territories and communities together.

However, this can make the unique atmospheres and qualities of each city even more important (Mokka et al., 2009). The lesson we can learn from both the *Città Slow* movement and *Talsinki/Hellinna* vision is that perhaps surprisingly, multilocality draws attention to the local identity. The benefit of a twincity is the flexibility to enjoy different places and spaces without having to travel extensively. There must be a reason to go to each city, whether it is a hobby, a certain restaurant, atmosphere or a professional project.

The increased mobility can become problematic, when a degrowth lifestyle is in conflict with material degrowth in the built environment. As the futures reports suggest, the efficient use of existing facilities is important. Flexibility might become an even more important aspect of architectural design in order to ensure efficient use of square meters. On the other hand, it is noteworthy that voluntary multilocal living is often a privileged opportunity, and new services for renting or shared commons can provide benefits of multilocal life for people who cannot access these kinds of leisure places otherwise. The digital platforms supporting circular economy can further promote the efficient use of facilities in multilocal lifestyle.

Kuittinen (2020, pp. 22-32) suggests strategies for future architecture, which tackle the symptoms and causes of the climate crisis. These strategies include efficient use of space and materials as a way to increase functional quality of a building without causing environmental harms, *simplification* in building design, construction and materials, and using architecture to reflect and promote sustainable and resilient lifestyles. These could be included in the degrowth strategies as more practical degrowth approaches. Thus, degrowth in architecture can be interpreted as a social strategy which changes the way we approach the use of a space but also as a strategy of using the material resources more efficiently. The economic aspect of the topic is discussed in the next theme, power and economy.

The lifestyle changes are required in all levels of society and from all stakeholders in order to build a positive culture to make sustainable lifestyles desirable. On the other hand, taxes and other incentives can be used to promote more sustainable lifestyle choices. In addition, many of the lifestyle alternatives associated with low carbon footprint are not only better for the environment,

but studies show that they promote well-being of an individual: remote work, less commuting, cycling and increasing plant-based foods, all have positive impacts such as increased fitness levels, more leisure time and saving money (Lettermeier et al., 2019, pp. 65, 68). Furthermore, many architectural design choices promoting resilience and sustainability in everyday environments are often considered as positive additions to cities. For instance, green spaces, parks, pedestrian and bicycle-friendly urban fabric and functional public transport create experiental urban life for city dwellers.

How does a home based on a flexible degrowth lifestyle then look like? Danish architecture office Lendager has been exploring the home designed upon the ideas of sharing economy and sustainable lifestyle in their project *Upcycle Studios* (2018). As seen in Figure 33, the plan of the house is designed to be flexible and use the square meters efficiently during different times and daily activities and also in different phases of life. The house can be transformed into a workshop or even divided into two apartments. The houses are constructed with building waste such as crushed concrete, residual wood, offcut timber and windows from old buildings. (Lendager, n.d.-b) The innovative design takes into consideration several aspects of circular economy and degrowth: the lifestyle and efficient use of materials and square meters.

The architecture of degrowth seeks to promote growth on the societal level. Can the built environment promote subtle changes in behaviors toward more sustainable living, like adopting slow city or rural strategies? Can architects design institutions of degrowth to offer alternatives to citizens?

## 3.2 POWER AND ECONOMY

FUTURE VISIONS

Power and economy are closely related topics as the tension between growth and degrowth suggests. Market forces and political decisions have a direct impact on where, what and how the built environment is designed and planned. The theories of change also remind us about the importance of being aware of the values of our own and other's and how important it is to make conscious choices based on the value-systems. This is why the connection between economy, power and architecture is crucial to gain knowledge about the future built environment.

In the previous chapter the circular economy was introduced from the perspective of lifestyles. However, circular economy in architecture has a potential to change the use of material resources significantly. It will have its impact on the designing processes and even aesthetics. Circular economy is based on efficient and sustainable use of materials, reducing the use of natural resources and virgin material and prolonging the lifecycles of existing materials while generating financial profits. *Digitalisation* can be harnessed to shift the structures of society toward circular economy. (Finnish Government, 2021, p. 26) In addition, new separation techniques for materials are studied in order to prolong the lifecycles of the materials (Linturi & Kuusi, 2018, p. 98).

The material scarcity raises the expenses of building and the construction business is forced to shift toward circular economy and repair construction (Dufva, 2020, pp. 15-16). Most of the steel, concrete, plastic and wood is flowing through the construction sector in Finland and that is why it is a significant potential source of change. It is also noteworthy that updates in Finnish legislation are already under way, which are promoting digitalisation, low carbon emissions, lifecycle assessment and circular economy at the time this thesis is being written. (Finnish Government, 2021, pp. 70, 72) Thus, it is expected that all architects will have to work within the framework of the circular economy in some way in the future.

Construction and building sector is one of the least digitised areas and thus new ways of working will be expected to be implemented and developed in the near future (Finnish Government, 2021, p. 72). *Blockchain technology* can be applied to sustainable building and maintenance processes to follow and document the origins of resources and carbon footprint of different material products (Dufva, 2020, pp. 40-41; Linturi & Kuusi, 2018, p. 105). Blockchain technology is a decentralised system which secures trust, transparency and authenticity of the documents (Linturi & Kuusi, 2018, p. 167). This might accelerate the shift toward the circular economy in the construction sector. Digital material passports can be used for tracking the resources (Finnish Government, 2021, p. 73) and perhaps the passports can be in blockchain to secure the efficient distribution, reuse and provide a trustworthy source of information in the future. However, the efficency and usefulness of energy intensive blockchain technology itself is debated and thus might not become a rapid change. *Crowdfunding* is another new opportunity, which digitalisation makes worth investing effort into. It can be harnessed to collect funds to realise different small projects outside of traditional construction business (Linturi & Kuusi, 2018, p. 371).

Digitalisation and development of technology is suggesting new ways to present and collect information about buildings and cities. *Smart City* and *Smart Building agendas, Internet of Things* (IoT), including *digital twins* of cities and buildings produce up-to-date data by creating virtual duplicates of the existing world. Constant feedback from our concrete reality changes the way the technology and built environment changes and adapts. Automatically adapting environment can be described as ubiquitous environment (Linturi & Kuusi, 2018, p. 281). For example, interactive spaces can be created with spoken guidance, which can help someone navigate through a building or with *Mobility as a Service* (MaaS), which might change the way we use transportation (Linturi & Kuusi, 2018, pp. 101-102, 281-282).

The dynamics of the real estate market demonstrate the power of politics and economy and how they change the built environment before it is even designed by an architect. The governmental stakeholders are responsible for allocating the built areas and defining the policies for designing and building, but currently the market forces define the quality and even typologies and materials of how the apartments and public buildings are designed. The architect's tools to create spaces for quality of living are thus limited. The researchers claim that the excess production of microhouses in Helsinki will be a serious future problem, if a large portion of housing options are too small, lack daylight and different spaces for different everyday life activities (Pelsmakers, Saarimaa, Vaattovaara, 2021). In addition, some investors buy apartments and renovate them just enough to refurbish the surfaces with cheap materials to gain profits when the apartment is resold. Many architectural practices support the system of material and financial growth, without possibilities to impact the decisions made before the designing process. The resources of architecture are used to support the system of financial growth instead of the growth of social well-being.

Circular economy as a highly probable future change appears on reports, news headlines and even business statements. Circular economy is relevant for architecture because the model of economy changes the very concrete part of designing in addition to the lifestyles as explored in the previous chapter. The material aspect of the circular economy forces architects to rethink the building materials from two perspectives. First, how to use new material efficiently and how to think about the whole lifecycle of the material and designed buildings? Second, how to utilise building waste and existing materials in the buildings? In other words, how to design with salvaged materials? Building materials should be easily dismantled and used in another place to keep the material resources flowing from one use to another.

Reuse of building materials has been a familiar practice already for ancient Romans, who also used them to create narratives in the built environment with reclaimed building elements describing the history of previous rulers (Stokstad & Cothren, 2011, p. 210). Reclaimed materials in contemporary architecture might be first and foremost a pragmatic design approach to the problem of limited resources. Nevertheless, aesthetic qualities of reclaimed

materials can dominate the design. Eclectic aesthetics require careful judgment from the architect, but it can change the mainstream taste as well over time. All of these aesthetic and cultural questions are just a scratch on the surface when the circular economy enters the stage of the built environment.

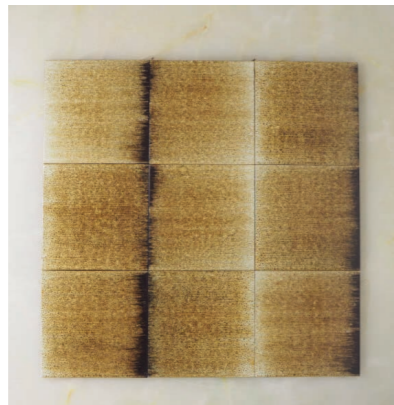## ROTOR, RESOURCE ROWS AND RECLAIMED MATERIALS

Architecture and design office Rotor realised that enormous amount of usable material was wasted from office buildings every single time a tenant changed. Thus, they started to create their own network of partnerships with the owners and both trade and design with salvaged materials in Brussels (see Figure 37). (Devlieger, 2020, p. 43) Working with reclaimed materials changes the design process and can be difficult to adopt widely and rapidly in architecture. Standardised, laboratory tested and modular building components allow architects to define and design buildings precisely to the smallest details, which is not the case when working with salvaged materials. Supply of certain materials with certain dimensions are not always available and thus the design process is not as straightforward and efficient (Devlieger, 2020, p. 41). A designer has to design with what exists rather than trusting in the standards. In addition, the materials need to be in good condition, safe and not contain toxic chemicals. Rotor Deconstruct (Rotor DC), the spin-off business of Rotor, have thus developed dismantling techniques (Rotor DC, n.d.). The problem of building waste becomes a business requiring expertise.

Rotor's approach to the economic system is based on the belief that the market for salvaged materials can be created or promoted with design choices and proposals (Devlieger, 2020, p. 43). Their own practice and design services have certainly had a positive impact on the circular economy in design. Thus, Rotor DC is an encouraging example of a new way to approach sustainability, business and architecture. The practice celebrates the uncertainty in a way that is not trying to freeze the time and edit the existing moment, but accepts that each project needs to be considered separately and as a unique whole changing over time.

WHAT IF BUILDING WASTE
BECAME AN ARCHITECTURAL
BUSINESS IDEA?



SHOP FOR
SALVAGED
MATERIAL



RECLAIMED
BRICKWALLS

**Figure 37.** RotorDC, A selection of building materials from the webshop, n.d.
**Figure 38.** Lendager, *Resource Rows,* 2019.

RotorDC and Lendager consider the building waste as a resource and use it for architectural design.

Similar to Rotor, Lendager has found a way to utilise building waste and design with the change in mind. Urbanisation and shrinking cities has created a problem of existing material organisation in wrong places. Lendager has designed a residential building *The Resource Rows* (2019), as seen in Figure 38 using old brickwalls as facade elements from abandoned buildings including old schools, industrial buildings and Carlsberg's breweries in Copenhagen. Lendager has developed the innovation of using the brickwalls as elements in steel frames instead of dismantling each brick. The strong mortar between the bricks would have made the dismantling process difficult. (Lendager, n.d.-a) Circular economy can offer a brilliant solution for construction waste and reorganise existing material from abandoned places to growing urban or built-up areas. However, new questions rises. When is it better to try to find a new use for a building, can it be refurbished or transformed? Has the building historical value, and should it be considered as building heritage? Is building heritage or historical value related to the place and what if a part of a building is transported to another location?

## ASSEMBLE, RAUMLABOR BERLIN AND NEW ORGANISATION OF THE PRACTICE

The power Rotor and Lendager have gained is due to the way they approach a difficulty as a strength in their practices and business models. Sustainability is thus used as a business concept rather than merely a strategy to deal with a problem. In other words, these practices have found a way to operate in the existing system with their own terms. They act with conscious choices rather than reacting to external forces. The digitalisation offers yet another platform to find alternative ways to finance projects. The changing world creates new possibilities to realise bottom-up initiatives and practice architecture outside of traditional offices. Architect Chris Precht explored the idea of minting *Non-Fungible-Tokens, NFT's*, as seen in Figure 39, of his digital art to blockchain to be sold in cryptocurrency to create a new financial revenue. Eventually, the
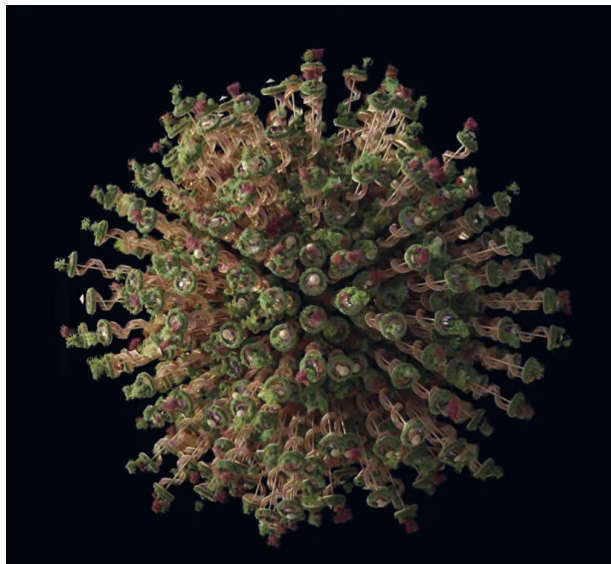


**Figure 39.** Chris Precht, *Isolation*, 2021. Isolation was supposed to be minted as an NFT, but is now on display on YouTube. The artwork refers to the Covid-19 pandemic.

blockchain as a platform did not fit into his own valuesystem because of the amount of energy the minting process would have taken. (Tabuchi, 2021) Nevertheless, it is an example of new ways to fund and encourage architects to work with projects more meaningful to them personally.

Alternative ways to approach economic and political power structures can also be created by reorganising the practice itself. The self-initiated and self-built project *The Cineroleum* (2010) as seen in Figure 40 marks the beginning of a London-based architectural and design collective Assemble as seen in Figure 41. A group of about 20 friends wanted to do something outside of traditional office jobs and decided to turn an old petroleum station into a cinema. The collective tries to work with flat-hierarchy by taking into consideration the personal interests of other team members and by inviting collaborators, like artists and fabricators, to work with them in the co-working studio spaces.



**Figure 40.** Assemble, *The Cineroleum*, 2010. Assembles first project was self-built and self-initiated.

The unconventional initiative of starting something by finding a project site and brief themselves, and working from there has enabled the collective to work with alternative projects. Jane Hall, one of the founders, describes how they focus on the design process rather than the outcome. (Assemble, n.d.; Harris, Hyde, Marcaccio, 2021, pp. 127-128, 132, 135) This emphasis on the process is a future-oriented approach to design, which the theories of change introduce. Assemble is offered interesting projects and they have the leverage to negotiate different aspects of the projects because of the way they work and because they are up-front with their values (Harriss, Hyde, Marcaccio, 2021, pp. 133, 137). I reckon many offices miss this realisation that specific values or way of organising the work itself can be a strength. It can be further used to gain wanted attention from investors, developers or other stakeholders.

# WHAT IF ARCHITECTURE WAS A SHARED PROJECT?







**Version 1.0** December 2018

## The DfMA Housing Manual

An introduction to the principles of Design for Manufacture & Assembly (DfMA) for Homes by **Open Systems Lab**

"FLAT-HIERARCHY" OFFICE

OPEN-SOURCE BUILDING MANUAL
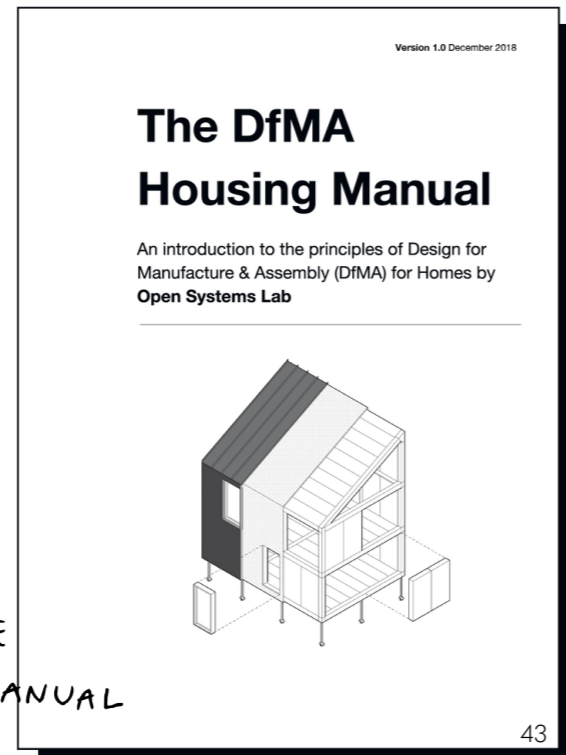
Figure 41.     Assemble, n.d.
Figure 42.     Open Systems Lab, *Wikihouse*, 2018.
Figure 43.     Open Systems Lab, *The DfMA Housing Manual*, 2018.
Figure 44.     Hawkings\Brown, Architecture 00, *The Gantry*, 2018.
Figures 45-46.  Raumlabor Berlin and Universität der Künste Berlin, *Making Futures School*, 2019.

Power structures in architecture, both internal and external, can be approached alternatively. These projects suggest that architectural practice does not have to follow existing patterns.

OPEN-SOURCED STUDIOS







OPEN-SOURCING THE FUTURE SCHOOL

Raumlabor Berlin together with Universität der Künste Berlin created a project called *Making Futures School* in 2019, as seen in Figures 45-46. The two week workshop took place in a building which had been under a threat of demolition and unoccupied since 2008, Haus der Statistik near Alexanderplatz Berlin. *Making Futures School* follows the logic of the open-form, the idea that something new can be initiated and created with collective effort. The initiative invited architecture students, artists and teachers to reimagine the future of school, architectural practice and the possible futures of the building itself. Exercises of speculation included mapping the cultural and social dimensions of the spaces, generating knowledge of the surrounding urban life, documenting the activities and creating installations and performances, for example. The events brought life to the building during the day and night. (Shipwright & Talevi, 2019, pp. 3-5, 8, 11-14, 21, 31, 35)

The essential idea behind the project proposes architectural agency as a resource and a process while detaching the authorship of an architect from the practice (Shipwright & Talevi, 2019, pp. 14, 18). Both Assemble and Raumlabor Berlin give up some degree of control to invite other people in to the architectural practice. They see it as a possibility to create something new instead of feeling protective toward the authorship. The space is used as a open platform for experimenting and collective imagination. *Making Futures School* is also a political statement. The participants created knowledge and designs proposals in situ for the alternative uses of the building which had been seen as worthless.

## WIKIHOUSE AND OPEN-SOURCED ARCHITECTURE

Although Assemble is not based on an *open-sourced* or *crowdsourced* way of working, it has many similarities to practice architecture, art and design more like a network than a hierarchical traditional office. Networks can be a part of future architectural practice as enablers. *Crowdfunding* can be a source of revenue which enables bottom-up initiatives to be realised without traditional developers and investors. Crowdsourcing is another way to democratise the design process itself. Crowdsourcing and open-source brings us back to the political aspects of power. Open-source aims to blur the boundaries

between the end-user and the creator by involving the end-user transparently in the development of the product (Dortheimer & Margalit, 2020, p. 277). Open-source can be approached by a participatory exercises which invites the users into the design process or as a movement inside the design or architectural community to work more like a network than individual teams. The design project itself or parts of the process can be designed with the power of a community. Dortheimer and Margalit (2020, pp. 277-278) argue that formation of open-source networks and tools in architecture has been rather slow, because the expertise in practice involves tacit knowledge, which is hard to communicate to people outside of the discipline.

The idea of crowdsourcing is not that foreign to architects. The competition culture is often a way to develop ideas and get commissions. Crowdsourcing is an interesting way to connect like-minded people and start a change from the grass-root level. The design aspect of crowdsourcing starts with a problem and a platform where anyone or a limited, but large group of people, can contribute. This can be a one-off project with limited time frame or open-ended, ongoing endeavour to make something better by revising it multiple times. Compared to the architectural competition culture, crowdsourcing is an open project, where one can add, modify and correct information other people have shared. This idea of a common open project removes the competition from the traditional model of working on one architectural problem by several individual teams separately. Picon (2019, pp. 33-34) argues that most digital tools in building industry and architecture, like *Building Information Modeling (BIM)* are for collaborating but also for control. The network-model promoted by the open-source movement suggests one to give up some degree of that control.

Crowdsourcing and open-source methods can be powerful tools to solve design problems in the future. However, the complex nature of the design and building processes might be too chaotic if organised completely with these methods. Rather, parts of the process, such as brainstorming, feedback rounds or certain parts of the design could be a compact, comprehensible design task to crowdsource.

*The Wikihouse* (2018) by Open Systems Lab has been developed and is being reiterated by a group of contributors. *The Wikihouse* files are open-source and the files for 3D-model and CNC-cutting can be downloaded and modified for free (Open Systems Lab, 2018, p. 3). The design of the Wikihouse aims to reduce costs, complexity, material consumption, time of assembly and to minimise the required skills in assembly, thus making the project available to be built by almost anyone. The strategies for achieving these goals are: *setting precision to a standard, designing out hazards, gaining feedback as much as possible* and *choosing dry processes in building*. *The Wikihouse* contributors can suggest edits to the design, the manuals and guides as well as taking part into the community challenges. There are already some *Wikihouse* projects built around the globe. (Open Systems Lab, 2019, pp. 10, 19-21; Open Systems Lab, n.d.) As seen in Figure 44 Hawkins/Brown and Architecture 00 (2018) have used *Wikihouse*-files to create a place for artist studios, *the Gantry*, in a former steel frame structure built for London Olympics 2012.

*The Wikihouse* project exists in files, which can be downloaded and modified by anyone, but the production and fabrication is a local project. The global, digital project becomes a concrete realised house, when cut and assembled locally. Moreover, the project is detached from reality, in the digital realm before adding the physical context in to the project. The realities of local conditions and circumstances become a relevant aspect when the house is planned for a certain site. How does the building fit into the site? How much does it actually cost? Does it fit in the cultural and aesthetic context? Does it meet the requirements to get a building permit?



**Figure 47.** Kalasatama area in Helsinki has been one of the testing sites for smart city technologies and services.

## SMART ARCHITECTURE AND THE AGE OF ARTIFICIAL ENVIRONMENTS

We already experience the built environment through technology in our everyday lives. We check the timetables of public transport with a mobile phone application, decide which route is the best for us, or search for a restaurant suggestion based on our previous preferences. The new way of seeing and comprehending the world changes the use of the architecture as well. Thus, the way we live and use the built environment is in constant flux, even though the existing building stock and city fabric adapts and changes at a slower pace.

Radical, disruptive technologies and their applications, such as *virtual reality, augmented reality, machine learning, artificial intelligence, smart cities* and *buildings, robotisation, self-driving cars* and *drones* represent the great promise of utopian reality to some and for some chaotic dystopian image of the future. It is often the lack of understanding of the technology and the applications that create these kinds of polarised views. Everyday life does not automatically improve with more technology embedded in buildings and cities, but it can increase the functionality of the built environment. Kalasatama area in Helsinki, as seen in Figures 47 and 48, has been a testing site for using smart technologies for services and planning. However, quickly changing technologies are problematic in the built environment, because they change far more frequently than other parts of the buildings (Brand, 1994). Thus, architects should be aware and interested in those developments.



**Figure 48.** Kalasatama's future plans are available as open data online in a digital twin of the area.

The boundaries between spaces of real, artificial, material, digital and virtual become blurred in the era of smart technology. On the other hand, the existing and constantly updating and generating data define the overlapping realms of digital and material, abstract and concrete. The age of the smart proposes a new question: is this real? Does it matter? The time frames of
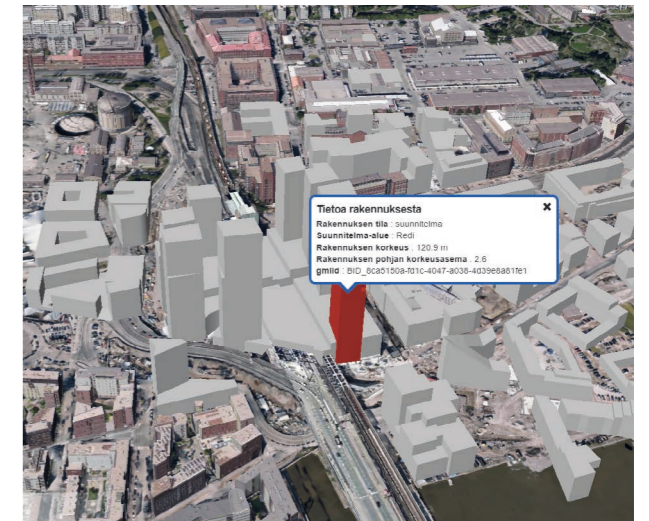
**Figure 49.** Songdo, South-Korea, 2015.
Songdo is a city which was created from nothing with an ambitious smart city agendas, but failed to provide livable urban spaces.

a building process discussed on the theories of change are challenged in the virtual realm. The temporality and permanence in architecture can be approached differently when the architectural media is produced to circulate, from architect to client and all the way to professional and public audience (Abrons, 2019, p. 13). In addition, the smart technologies not only provide functionality for its users, but produce a large amount of information about the users. This fast paced production of both architectural media and on the other hand the data and the reactions of the users, creates abundance of material to make informed design decisions. Developing technology further questions the power architects can access and use. The circulation and access to data, proposals and opinions are plenty. How to make sense of all that noise and make informed judgements to design spaces and places of well-being for the future?

Technology itself does not increase the quality of life, but the way we use it can. Hollands (2008, p. 305) emphasises the problematic nature of the term *Smart City*, as it has a positive connotation, although it is not always that clear what the label means. In other words, embedding technology everywhere and anything in the built environment does not necessarily provide more functional or livable spaces whether it is called smart or not. Luusua and Ylipulli (2020) suggest that speculative design could be a powerful tool to interpret social and ethical aspects of new radical technology, such as *Artificial Intelligence* or *Face Recognition*, because design inherently is adapting the technology in everyday life. Furthermore, the designing processes involve subjective judgement and ethical, cultural and social consideration of the context and risks, which is valuable in addressing the problematic use of a certain technology. (Luusua & Ylipulli, 2020, pp. 8-9) This is also where the dark design reveals its power.

The existing and constantly updating data gives architects new tools and information to base decisions on. However, we should also be aware of the biases behind gathered data when designing for the future. For example, some places might be used only by certain groups of people because it is inaccessible. Thus, the data does not reveal the real problems. Defining goals and values are important frameworks for the information to be reflected into. Adoption of technologies is often connected to power relations (Luusua & Ylipulli, 2020, p. 8). Hollands (2008, pp. 313, 315-316) continues that smart city agendas should focus on the citizens, their democratic participation and needs instead of just increasing the amount of technology in a city as there is a risk of creating inequality. Korean city Songdo, as seen in Figure 49, is an example of a city which failed to provide urban spaces for citizens to enjoy everyday life by following too closely smart city agendas.

If we acknowledge that design is the translator between technology, science and everyday life, the architect's role as a mediator is invaluable. The knowledge architects can produce about the problematic aspects of certain technologies is relevant for ethical, social and cultural discussions. An architect's opinions in the political and economical decision-making seems thus justified. The exercise of translating a scientific study into reality by designing Dunne and Raby described, is increasingly relevant strategy when the connection between disruptive technology, like smart city agendas, and everyday life is acknowledged.

## DESIGN EARTH AND POLITICAL STATEMENTS

*The Planet After Geoengineering* (2021), as seen in Figure 50 is one of the examples of how DESIGN EARTH uses stories and the narrative power to illustrate alternative futures with architectural language. The video made of the project is on display in Venice Architecture Biennale 2021 (La Biennale Architettura di Venezia) at the time this thesis is being written. Five visual narratives, *Petrified Carbon, Arctic Albedo, Sky River, Sulfur Storm* and *Dust Cloud* addresses the issues such as permafrost and ocean acidification, and suggest imaginative solutions like open water algae plantations, carbon capture machine cities. They describe scenarios where a specific geoengineering technology is deployed to alter the climate and the consequences those actions have. (DESIGN EARTH, 2021) Their work reminds me of the dark

design as the scenarios try to reveal the negative consequences in addition to positive impacts. The speculative storytelling and the medium of the video with illustrations allow DESIGN EARTH to embrace the planetary scale of the earth and thus be involved in political discussion. They have created the format to comment on the technological progress and the political decision-making with architectural visioning.

Architects and architecture are intertwined in several ways with political and economical forces of power, but the connections can also be a leverage to impact the society. Questioning the status quo with a spatial narrative, finding alternative funding solutions, creating a business model around an alternative or creating a platform for collaboration are all alternative ways to practice architecture within the existing power and economy structure. However, they reveal that the future of architectural practice can be more free from the existing power connections than it might look like at first glance.
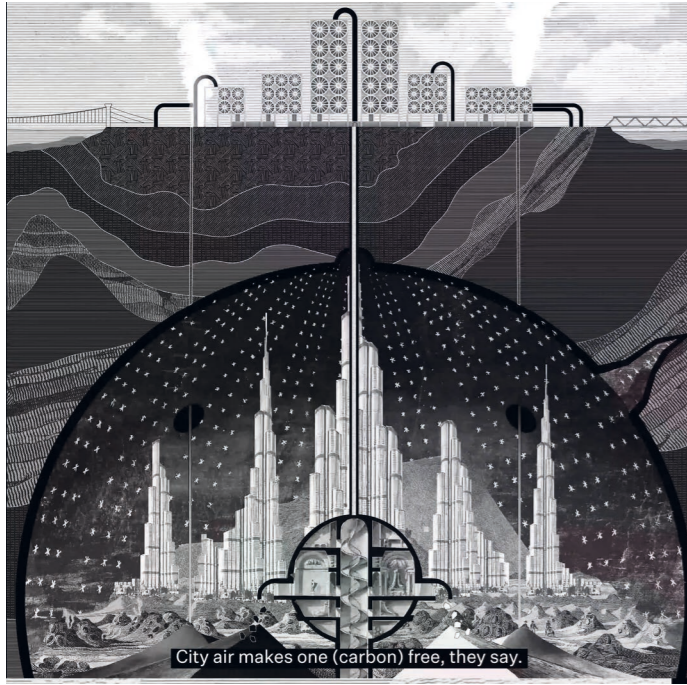


City air makes one (carbon) free, they say.

**Figure 50.** DESIGN EARTH, *The Planet After Geoengineering,* 2021. The project explores geoengineering technologies with visual political narratives.

# 3.3 AGEING & DIVERSIFYING POPULATION

Ageing population is a global megatrend, which in addition to decreasing birth rate as well as immigration, changes the structure of the population in Western countries (Dufva, 2020, pp. 22-23). The population of Finland is becoming grey rapidly. More than a quarter of the population will be over 65 years old in Finland already by 2060, if the birth rate and immigration does not change remarkably (Official Statistics of Finland [OSV], 2019). As seen in Figures 51-54. the trend is similar in countries such as Japan and United Kingdom and on the European level. Aforementioned growing group of people is such a significant part of the future society that it cannot be overlooked. Thus, ageing population raises the question of inclusion and exclusion in architecture.

The impact of ageing people in society, culture and economy is complex, because the growing group of elders is not homogenous. High standard of living and effective health care ensure that an average retired person is still an active and healthy member of society for a longer period of time than before (Dufva, 2020, p. 23). Consequently, the active retirees want to enjoy all the leisure possibilities in life, like travelling, visiting theathers, museums, life-long learning or sports activities, for example. In addition, Balcom Raleigh, Kirveennummi and Puustinen (2020, p. 63) introduce a second group called *super-elders*, people living over 105 years old. Diseases related to ageing, such as Alzheimer's disease, become more common as the group of elderly grows (Dufva, 2020, p. 22). The needs, requests and ideas of well-being in a built environment come in many shapes and sizes in the future.

World Health Organization (WHO, 2007) introduces the concept of *active ageing* as ''*optimizing opportunities for health, participation and security in order to enhance quality of life as people age*'' (p. 5). The quality of life and maintaining one's health and well-being as long as possible is the key concerns of ageing during the 21st century (Dufva, 2020, p. 23). Built environment can support active ageing. The requirements and the use of different spaces change as the population grows older (Linturi & Kuusi, 2018, p. 104). Spaces and facilities can increase or decrease the independence, social participation and quality of life (WHO, 2007, p. 12; Sosiaali- ja Terveysministeriö & Kuntaliitto, 2007, p. 26).

Technological innovations, such as therapy robots and videochats can increase remote care (Sosiaali- ja terveysministeriö & Kuntaliitto, 2007, p. 28), which on the other hand can offer a possibility to connect with the older members of the family living in rural areas (Pitkänen & Strandell, 2018, p. 16). In addition, especially the independent living of super-elders can be supported by technology to increase their mobility and independence in their own apartments. Smart home technologies such as monitors and sensors installed into walls, floors and appliances, can send information straight to the family, caretakers or healthcare providers. Robotisation and automatisation should be harnessed to help the health care workers and to increase the safety and well-being of their customers. (Sosiaali- ja terveysministeriö & Kuntaliitto, 2007, pp. 26, 28)
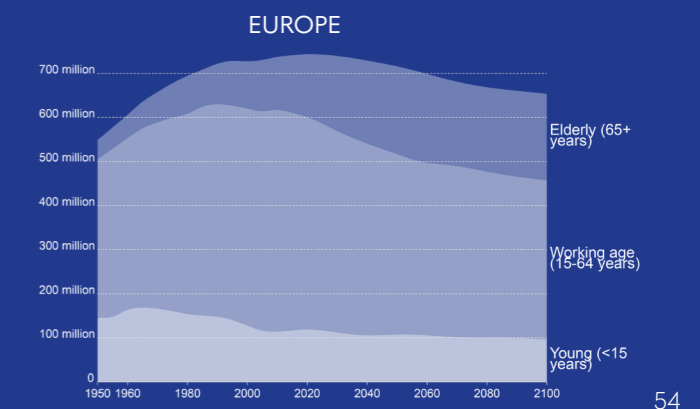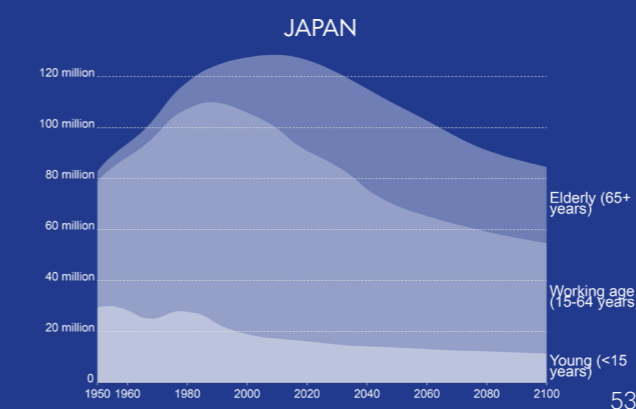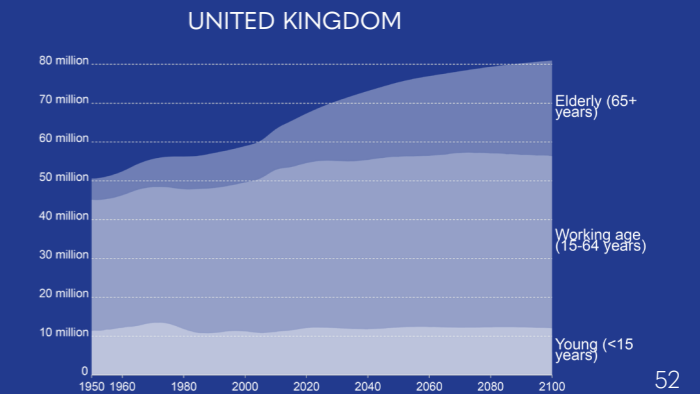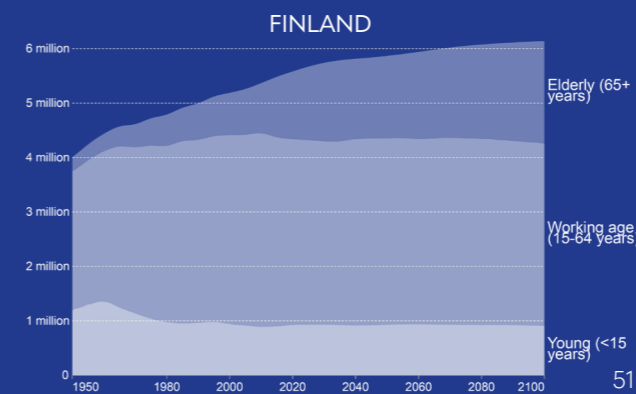


**Figures 51-54.** Historic estimates from 1950 to 2015 and projection of population to 2100 of young, working-age and elderly populations in Finland, United Kingdom, Japan and Europe. The estimated development is based on the UN medium scenario. (Richie & Roser, 2019)

Standardisation in architecture based on human measurements provided an utopian promise of quality living to all in the past. The connection between a normatised body and spatial dimensions can be traced from da Vinci's *Vitruvian Man* (c. 1490), Neufert's *Architect's Data* (1936) or Le Corbusier's *Le Modulor* (1948). These standards define architectural design still today, although the idea of a standard person living a standard life can be an exclusive concept. Is architecture serving an even smaller group of privileged people as the structure of population changes and the focus on diversity is acknowledged?

Findings from futures studies reports suggest a couple of important forces of change in age-friendly architecture. First, accessibility becomes the key aspect of design throughout the different scales of architecture from housing design to urban planning. The central question in architecture thus is, what are the design solutions for inclusive spaces which encourage and promote independent, participatory and intergenerational living. Second, there will most probably be increased use of certain types of spaces, like sport and leisure facilities, healthcare centres and cultural institutions. The use of the facilities might increase especially during weekdays and daytimes, when retirees are free to attend activities. The statistics suggest that Finnish retirees are eager summer cottage visitors, but enjoy living in urban environments (Pitkänen & Strandell, 2018, p. 13). Multilocality can thus be a lifestyle choice for active retired citizens. However, the connections and services between homes and extended homes become important.

## SHRINKING CITIES AND INTERGENERATIONAL OPPORTUNITIES

Urbanisation has accelerated the shrinking process in towns, where young people move to larger cities and the remaining population is ageing. Taegen, Verma and Arpiainen (2020) suggest strategies to develop built up areas in municipalities with shrinking and ageing population by defining two main areas to focus on. First, the central areas can be enliven by combining services and creating networks of services between different areas and municipalities. Thus, functionality is increased by defining the hubs of activity and the existing facilities are used more efficiently. In addition, the outer edges of

the areas are suggested to be defined clearly by demolition. (Taegen, Verma, Arpiainen, 2020, pp. 55-57) These strategies apply urban planning into areas where density is decreasing. The idea is to build density within a hub and create a sense of a place with community.

Municipalities with shrinking population in Finland could benefit from emphasising the unique qualities of smaller places, like the sense of community or small scale (Taegen, Verma, Arpiainen, 2020, p. 66). Can slow living strategies be considered also as a potential strategy for branding shrinking cities? The visitors and people with leisure homes in the countryside can be attracted by focusing on the local identity and thus to enliven the built-up areas. The development of the shrinking towns and cities is relevant in order to keep the places lively and bring income to the areas. This is a crucial aspect to consider, because the income in taxes is decreasing as the young people move to bigger cities and the remaining population is ageing (Taegen, Verma & Arpiainen, 2020, p. 64). The local businesses and the residents can benefit from branding the city as a slow city.

## THE ALZHEIMER'S VILLAGE AND INCLUSION THROUGH EXCLUSION

Increasing number of people with memory-related diseases define new architectural dilemma: how to both provide freedom of living and secure a safe environment to promote well-being? Danish architecture office, NORD Architects in collaboration with a French architecture office Champagnat & Gregoire and memory-related disease researchers have designed a new kind of village just outside of Dax, France (Département des Landes, n.d.). *The Alzheimer's Village* (2018) solves the problem of inclusion and exclusion by creating a fully functioning village with parks, shops, bakery and a healthcare centre for 120 inhabitants living with Alzheimer's disease or dementia (Département des Landes, n.d.; NORD Architects, n.d.). As seen in Figure 55 and 56, the premises have large outdoor spaces and gardens where buildings are situated alongside green pathways. Connection with nature is designed to be a multisensory experience (NORD Architects, n.d.), which also helps the residents to locate themselves (Département des Landes, n.d.). This project uses the nature and landscape as a healing, benevolent and inclusive part

WHAT IF A SPACE WAS

DEFINED BY INCLUSIVITY?





55 VILLAGE FOR PEOPLE
WITH MEMORY-RELTED
DISEASES

**Figure 55-56.** Champagnat & Grègoire Architects and NORD Architects, *The Alzheimer's Village*, 2018.
**Figure 57.** Pollard Thomas Edwards, *New Ground Cohousing*, 2016.
**Figure 58.** MIXdesign and Brenna Thompson, *Stalled!, Airport Prototype*, n.d.

Inclusive architecture is about providing safe spaces for people from all walks of life to meet and connect socially and live independently.

COHOUSING FOR
ELDERLY





INCLUSIVE
RESTROOM
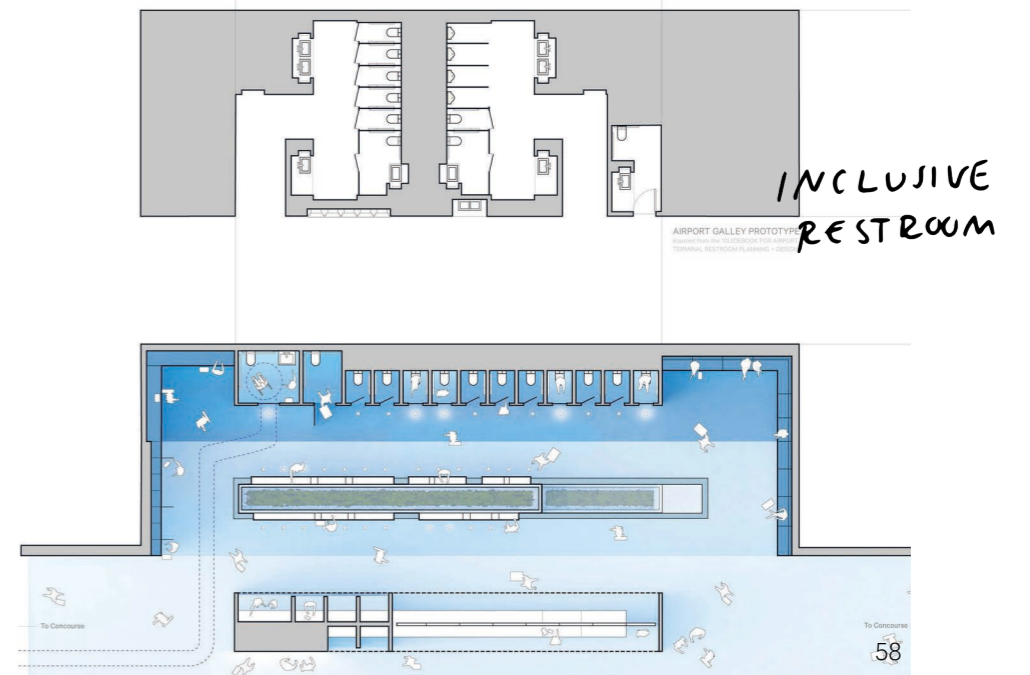
of the design. The village with over five hectare landscape park is discreetly surrounded by a fence avoiding being too enclosing (Département des Landes, n.d.). Inclusion is provided by creating a place for the residents to live as normally as possible.

The mobility between the zones of everyday environments is a fundamental challenge of everyday life for an ageing person. Consequently, accessible, inclusive architecture and urban design are like bridges between the zones. It can expand the radius of life and experiences by connecting the zones of the lived environment. The simplest example of this kind of architectural intervention is creating a place to rest, such as a bench. Benches along a walkway provide places to rest and thus promote independence (WHO, 2007, p. 13). This kind of a small gesture can have a tremendous impact on someone's life. It can encourage one to exercise, create a possibility to walk to the supermarket or provide an opportunity to connect with someone – to live a richer life. In *the Alzheimer's Village* in Dax, the sense of extended zones is created by including services, activities and landscape into the same area, incorporating the different zones of life together.

## NEW GROUND COHOUSING AND HOMES FOR ACTIVE AGEING

Active ageing can be promoted by providing housing where one is able to age and live as long as possible. Residential buildings promoting active ageing require flexibility and adaptability, including the modifications of existing building stock (WHO, 2007, p. 16). Accessible design choices create a baseline for mobility inside one's own home and thus extends the time elders are able to live at home. A home should be safe, affordable and accessible with essential services nearby and not impossible to maintain (WHO, 2007, pp. 30-35). Furthermore, accessible and affordable housing in a city creates inclusive and intergenerational urban neighbourhoods allowing people to live where they want to spend their time in. Consequently, housing design and location can have a positive impact on participation, sense of belonging to the community and well-being of the elderly population (WHO, 2007, p. 30).

What happens when a group of elderly women decide to build a community integrated into city life? *New Ground Cohousing* (2016), as seen in Figure 57, designed by Pollard Thomas Edwards, ensures that the senior inhabitants can be in charge of their lives with the support of the community. A group of senior women wanted to build a communal place for them to live together both privately and communally. The cohousing unit is located in Northern London close to the public transport and other services. The location allows the inhabitants to be part of the city. 25 custom homes, shared spaces such as laundry room and communal garden were designed with participatory, interactive design process in the form of workshops with the residents. (National Custom and Self Build Association (NaCSBA), n.d.) The initiative coming from the residents themselves, reveal the active role of the senior citizens in society. The project demonstrates that cohousing is not just for young, socially active urban people, but it can be a wonderful way to support independent, socially rich life during the later years in life.

Inclusive architecture requires inclusive connections. Technology can either shorten the social distances or create new boundaries. Safe and functional public transport to social activities or to health care services is an integral part of an age-friendly city (WHO, 2007, p. 20). Carefully designed accessible buildings become inaccessible, if it is difficult to travel there from home. A bus journey from home to healthcare centre can become impossible, if the only way to buy a ticket or check the timetables of public transport is with a mobile device. Information technology can be a convenient way to run an errand, but as the development of technology is rapid, it can be hard for a senior citizen to understand the ever-changing devices and machines. Technology can be a risk from this perpective, it can be inclusive or exclusive, enabling or disabling. Thus, the connection between the zones can be simply broken by adding a technological application. Consequently, it is important to carefully consider the biases behind the design process as we design the city with smart city or smart building agendas to ensure accessible environments to all. The importance of creating new opportunities for connection is even more important, if the social interactions are minimal due to robotisation and automatisation. Spaces for social interactions, especially intergenerational, can be considered an important aspect in architectural and urban design.

## STALLED!, MUF AND INTEGRITY

Designing inclusive spaces increases the well-being for everyone. Ageing population is a significant future phenomena which draws the attention to changing norms and standards of the built environment. However, an inclusive mindset in design extends to gender, age, income and ethnicity, for instance. Inclusive design requires an architect to be able to see the world through someone else's perspective, which draws the attention to the minorities. This kind of holistic point of view may be hard to achieve without input from the end-users, because of our own unconscious biases. Hence, participatory designing methods may become an increasingly important tool for the future designing

MIXdesign's research-oriented design project *Stalled!* includes an airport prototype of an inclusive restroom which differs from the traditional gender-segregated plan. The project team did an extensive research on transgender experiences in the public restrooms, which led into a need to create more inclusive designs for all. As seen in Figure 58, the plan is open, where the toilet stalls are separated from the other spaces by activity zones of grooming and washing. The materials and colours are chosen to be informative for visually impared people. The alcoves with curtains are for people who want some privacy for example for medical procedures or breastfeeding. The heights of mirrors and washing stations vary in order to meet the needs of children or wheelchair users. (MIXdesign, n.d.) The aim of the project is to create space, which would be safe and inviting for all the visitors despite their religion, gender, abilities, age, race or other factors that existing standard restrooms fail to provide. *Stalled!* proves that inclusive architecture can democratise space rather than creating discrimination by following standards.

How to speak up as an architect on the behalf of the unheard voices in discussions about the decisions defining the environments the minorities have to live in? British art and architecture practice Muf believes that when you are invited into the discussion, you should use the opportunity to invite others in (Harriss, Hyde, Marcaccio, 2021, p. 45). The combination of conceptual art and architecture allows them to create inclusive architecture. Participatory design methods in each phase of the process can be implemented through

art, for example. Harris, Hyde and Marcaccio (2021, pp. 42-48) interview one of the founders of Muf, Liza Fiori, who describes *brief obedience* as one of their strategies to include more diverse perspectives in design process. *Brief obedience* means holding the client accountable for their ambitions in the brief and pointing out the inconsistencies between the words and actions. Fiori also claims that accountability extends to themselves. They refuse to do only consultancy or brief writing, because they want to be involved in the development process all the way through. (Harriss, Hyde, Marcaccio, 2021, pp. 42-48) Fundamentally, the strategy Muf has chosen to promote inclusivity in architecture is about integrity. They expect their clients and themselves to have values, words and ambitions aligned with the action and choices.

The ageing and diversifying population challenges architects to question the standards and their own biases. The examples in this thematic category demonstrate how much a design choice can have an impact on one's life, either negatively or positively. Inclusivity requires being aware of the values, designer's own, client's and end-user's. The aspect of values connects the topic also to the theories of change. The examples introduced in this chapter exposes the influence architectural decisions can have on individual level. Often times a citizen cannot have a direct impact on those design choices designers make, but they have to live everyday with those decisions.

## 3.4 SNEAKY GREENS & ENGINEERED NATURE

FUTURE VISIONS

The futures studies reports, news headlines and articles inform us that the climate crisis is not only about resource scarcity and changing weather conditions, but also about biodiversity loss. The most important megatrend is ecological rebuilding, because all other trends become insignificant if the climate crisis persists (Dufva, 2020, p. 3). The building industry has been focused closely on carbon neutral building, while promoting biodiversity within the domain of built environment has just recently become something architects are starting to be aware of. Ecological rebuilding aims to preserve and promote well-being of both nature and a human being (Dufva, 2020, p. 3).

Changing circumstances set new boundaries and requirements for buildings and cities. Extreme weather conditions, such as floods, heat, rain and drought become more frequent and are a serious threat for the fragile nature (Dufva, 2017, pp. 15-16). Even the smallest green areas are important for supporting biodiversity. Green roofs and walls can be additional solutions to enhance biodiversity in the city, although they should not replace existing forests and green areas. (Ahlvik et al., 2021, pp. 8-9) The simplest solution for promoting biodiversity is to answer the problem with nature itself, which in a built environment can be called *nature-based solutions*. Nature-based solutions, which are inspired and supported by the natural processes in the architectural realm, can be transcalar interventions: urban parks, green walls or roofs, communal gardens or city cultivation. Nature-based solutions also help with the symptoms of climate change, such as improving air quality or moderating local climate (Lehvävirta et al, 2019, p. 61). Development of LED-light technology has a potential to integrate cultivation to cities and even to residential buildings and spaces where daylight cannot enter. Vertical farming is based on *hydroponic cultivation*, which uses square meters efficiently compared to traditional agriculture. Hydroponic cultivation requires just water, nutrients and a certain wavelength of light and can be robotised (Linturi & Kuusi, 2018, p. 82).

The importance of new materials and their recycling and efficient, optimised use becomes more relevant when the resources are limited (Dufva, 2020, p. 15). Linturi and Kuusi (2018, p. 94) argue that material production is currently an energy intensive process and in need of rethinking. Even larger percentage of emissions is expected to be produced by material production in the building sector and thus the shift toward more sustainable building material production is urgent (Finnish Government, 2021, p. 71). However, Linturi and Kuusi (2018, pp. 278, 302) claim, the building industry is slow to change due to its long processes, emphasis on short-term cost-efficiency and conservative nature. Reinforced concrete is one of the most energy intensive materials and most used in building projects. Hence, replacing cement and steel with fillers like plant fibres, ash or nanocellulose could decrease carbon emissions remarkably. Another nanomaterial called aerogel in thin layers can be used as insulation, also in existing buildings. The new materials can have beneficial qualities, like being extremely strong, light, tenacious, porous or insulating. (Linturi & Kuusi, 2018, pp. 98, 290, 301, 334) Building from wood is expected to increase. Nevertheless, new wood products can have an important part in the building industry, because efficient use of the material supports biodiversity and sustainable harvest. (Dufva, 2020, p. 16; Ahlvik et al., 2021, p. 9).

Growing shapes and forms is a part of larger scientific and technological phenomena called *biologisation*. Dufva (2019, p. 23) introduces biologisation, as the next emerging trend in production and design, which uses natural processes, *biomimicry* and technological innovations as interventions in nature. Fungi have been used to grow structures. Extremely tenacious cobwebs have been produced by spiders which are feeded nanocarbons. (Dufva, 2019, p. 38; Linturi & Kuusi, 2018, p. 95) Materials can grow into their shapes and have smart qualities, like self-healing concrete. Digital tools, such as parametric design can optimise, predict and find ways to control design and production. *4D-printing* offers yet another dimension in designing elements, objects and structures and learning from nature. An 4D-printed object changes its shape and form when exposed to environmental changes like temperature or electricity. Thus the material or object has a quality which can be compared to a memory. (Linturi & Kuusi, 2018, pp. 79, 293, 307)

This chapter is called Sneaky Greens & Engineered Nature, because these two themes are challenging the way we design nature itself and design with nature. They challenge the relationship between nature and human beings. The sneaky greens represent nature taking over cities and urban areas everywhere it is allowed to, like plants finding the smallest crack in the asphalt to sprout a new shoot of a plant. Although in this context, the act of bringing the green back to the cities is intentional and is done purposefully and oftentimes with a sense of control. Engineered nature, on the other hand, reflects the attempts to harness natural processes to create materials with the help of technology and process grown materials further to architectural elements. Technological innovations thus allow designers to approach nature from another point of view. In addition to seeking inspiration from nature, it is possible to intervene in natural processes in a controlled manner to create a desired outcome. In other words, instead of merely mimicking nature, nature can be engineered or designed. Thus, the themes reveal the contradiction between the wild, unruly, organic and control, order and precision. Yet, the boundary between artificial and natural becomes blurred.

According to Google's mobility data, the visits in public green areas increased significantly during the Covid-19 pandemic in 2020. The visits increased +517% at its peak compared to average numbers before in June in Finland. (Richie et al., 2021) Efficiently used squaremetres started to feel too small when urban living rooms, such as cafés, restaurants and libraries were closed. The only constant was local green spaces: seasons changed, flowers started to bloom and finally the leaves turned to warm hues. The need to use the outdoor spaces and connect with nature seemed to be more and more important for city dwellers. Those who had a summer cottage, escaped to the rural locations. Yet, it is hard to draw any definitive conclusions based on the statistics alone. However, the activity during the crisis indicates the importance of the green infrastructure and recreational areas in urban fabric.

## GREENEST OF THE GREEN AND COLLECTIVE SPATIAL IMAGINATION

The Fifth Dimension research group has studied the feelings and the emotions of urban residents about green infrastructure (Mesimäki et al., 2017) as well as their imagination for the future possibilities of the green roofs (Mesimäki et al., 2019). Their study suggests that urban residents were able to imagine a future city where pleasant green roofs would add positive experiential, social and multisensory value to everyday life (Mesimäki et al., 2017, p. 590). The researchers found in a further study that most respondents described having positive feelings such as joy, excitement and calmness while visiting a small green roof downtown Helsinki (Mesimäki et al., 2019, p. 119). The sneaky greens in cities are thus not only relevant for the environment but also for the quality of life. The sense of calm and serenity seem to stem from a primitive connection between nature and human beings.

Design and Architecture Agency Talli Ltd. has collaborated with research group the Fifth Dimension to use the knowledge of the green roofs in a life-size laboratory, a housing block called *Greenest of the Green* in Jätkäsaari, Helsinki (TA Companies, 2017, p. 15). As seen in Figure 59, the roof is filled with planting boxes, meadow-like surfaces and colourful patches of different species of plants. These green spaces include biodiversity roof, a rooftop kitchen garden, a forest-berry roof garden, and a yard garden, to mention but a few (TA Companies, 2017, p. 10). The aim was to test and study green spaces in a housing block in the biological, scientific, but also in the social contexts. The design process of the project has been transdisciplinary, involving expertise from architecture, landscape-architecture, construction, engineering and natural sciences (TA Companies, 2017, p. 5). The roof of the housing block creates yet another dimension of communal and green space in the urban area.

The important aspect in this project is that it is an open-ended research project, which the Fifth Dimension is supposed to study to find best solutions so that they can be applied in other places in the future. The open-endedness is a crucial starting point, because an architect has to accept that the finished outcomes, both biological and social, but also aesthetic, are out of control to some extent. The lead architect Pia Ilonen has described that the vegetation

WHAT IF URBAN EXPERIENTIAL
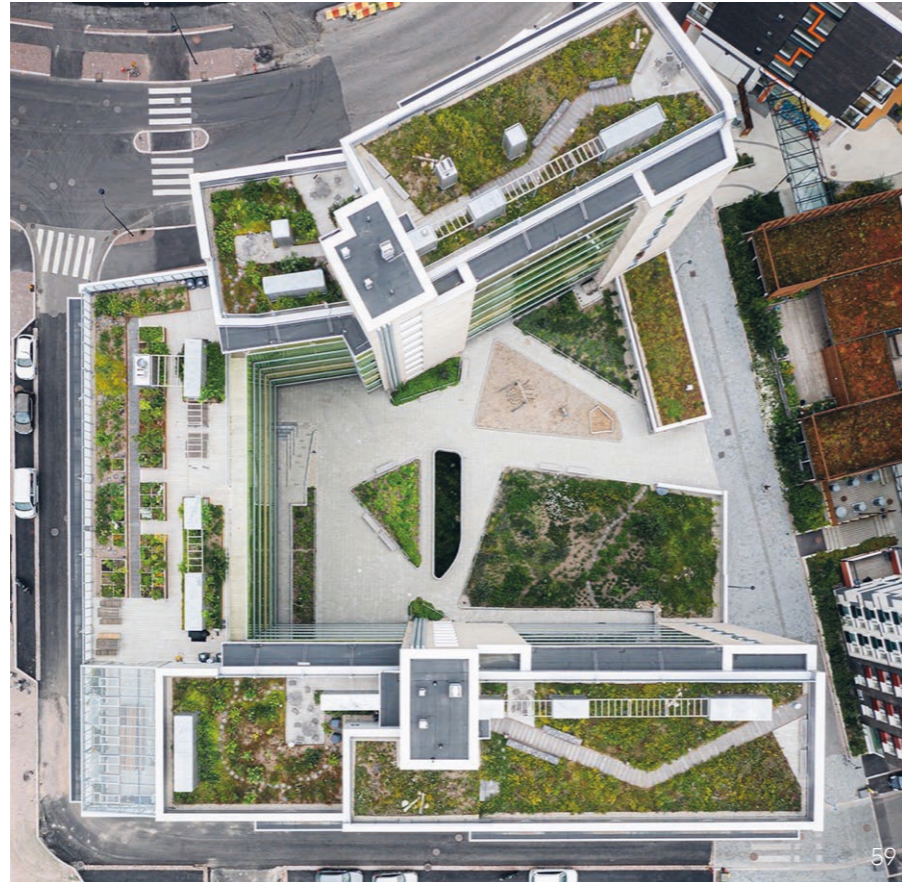SPACES SUPPORTED BIODIVERSITY?







**Figure 59-60.** Talli Ltd, *Greenest of the Green,* 2017.
**Figure 61.** James Corner Field Operations (Project Lead), Diller Scofidio + Renfro, and Piet Oudolf, *High Line,* 2006-2019.

Green infrastructure is a possibility to create experiental, benevolent spaces and promote biodiversity.

will be developing organically which made the design process of the facades more speculative, but the risks in the structures needed to be studied carefully (TA Companies, 2017, p. 6). As seen in Figure 60, the greenery cannot really be seen on the street, which might indicate that for example the lattices for the vining plants were not able to survive. Unfortunately, the nature does not extend into the streetscape.

The unpredictability in this project tests the limits of the architectural design and control. Besides, it can be questioned whether an architect should be involved in the longer monitoring research process to learn and develop the project, prototypes and finally design solutions and knowledge further. In that case, *Greenest of the Green* would fit into the transition design framework. The acceptance of mistakes and learning from them creates the freedom to imagine and test new solutions. In a broader perspective, the project is trying to find win-win solutions of green infrastructure in the built environment and environmental impact instead of accepting compromises. This requires communication and collaboration. In the *Greenest of the Green*, the architects were able to use the knowledge which the research group provided, but also they were able to involve the scientists in the design process to learn by designing. The research is not only interested in developing optimal designs for green roofs, but also to study and monitor the weather conditions, facade structures, survival of the vegetation over a longer period of time and learn from the experiential, social and communal dimension of the green spaces (TA Companies, 2017, p. 13).

## HIGH LINE AND EXPERIENTIAL URBAN GREEN SPACES

To return to the studies the Fifth Dimension has conducted, the respondents of the study imagined how public, semi-public and private spaces could facilitate activities with communal kitchen, back-yard and living room, or even yoga on a rooftop. Some respondents imagined the network of green roof terraces connected with bridges. (Mesimäki et al., 2017, pp. 594, 597) These exciting products of collective imagination offer a rich source of inspiration for architects. A green roof and green spaces extend to the social dimension by being a place for activity and thus everyday life. Recreational green space

*High Line* (2006-2019), as seen in Figure 61 in downtown New York City is an example of an experiental urban space integrating green infrastructure in city fabric. The elevated park is built on a former rail trails.

Slow living is also closely related to the green spaces. Experiential spaces and the places for withdrawal can be created around them. Gardening is considered a slow living activity with beneficial, calming effects during daily life (Craig & Parkins, 2006, p. 41). Following changing seasons was imagined adding a positive value for everyday life in research the Fifth Dimension conducted (Mesimäki et al., 2019, p. 112). Especially in Finnish conditions, four seasons were seen as a pleasant aspect of a green roof (Mesimäki et al., 2017, p. 594). All of these qualities of green infrastructure increase the well-being and life quality of a city dweller. Thus, the sneaky greens in a city is a matter of creating value with restorative power of nature for both citizens and environment.



**Figure 62.** Growing Underground is a London-based business which has occupied the Second World War shelters to cultivate produce hydroponically in a city.

*The Greenest of the Green* and also aforementioned *R-Urban* projects challenge one to see unoccupied spaces, whether they are a rooftop, abandoned buildings or empty urban spaces, as an opportunity to create social and ecological value in a neighbourhood. City cultivation might answer the problem of unoccupied spaces like former industrial buildings or empty warehouses. Furthermore, the hydroponic cultivation solutions allow occupation of spaces where the daylight cannot enter, even inside the residential buildings. As seen in Figure 62, a British company Growing Underground cultivates fresh produce in the shelters from the Second World War below the Clapham area in London (Ballard, 2018). Not only is the city cultivation and gardening a way to be self-suffient, resilient and produce food sustainably, but it can also provide value as an experience (Linturi & Kuusi, 2018, pp. 37, 84). A stewardship of a communal garden, a hydrophonic or not, can be a meaningful way for urban dwellers to connect socially.
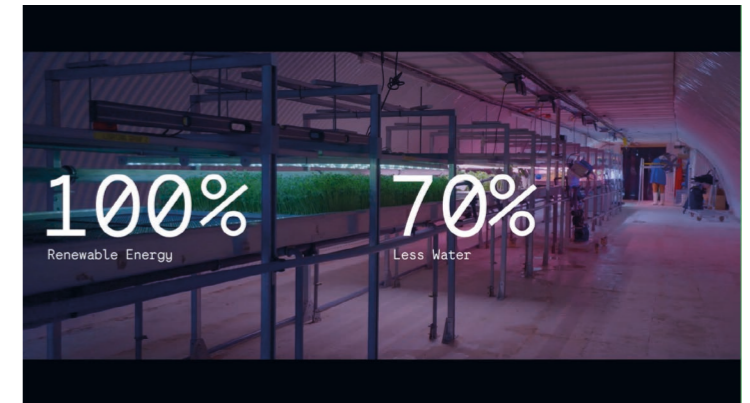
## RETHINKING MATERIALITY

The sneaky greens are fundamentally about providing spaces for nature to thrive, but engineered nature introduces the intervention of technology in nature. Rethinking materiality forces an architect to challenge the preconceived ideas of what the architecture feels, looks, smells and sounds like. On the other hand, the building processes have to be approached differently. Designing with new materials require one to study and understand the qualities and characteristics of a specific material, but the inspiration can stem from those observations. As seen in Figure 63, in order to speculate possibilities of bioplastics in the built realm, Saara Palmujoki and I learnt through trial and error how to cook and work with bioplastics for a studio project. The material studies guided us with our architectural proposal by teaching how to work with the material and its qualities. The new materials might seem like a distant future. Grown houses, seaweed pavilions or fungi bricks are closer to science fiction than everyday life.



**Figure 63.** Bioplastic studies for a studio project, Saara Palmujoki and Anniina Taivainen, 2019.

However, I consider these innovations and experimentations inspiring and an important aspect to study as a part of future architecture. First, the material dimension of the built environment can be regarded as the closest to everyday because of the sensory experiences. Second, the purity of whiteness, representing beginnings and rectangular rationality inherited from the modernists as Till (2009, pp. 81, 101) describes, are quite a stark juxtaposition with the wild nature. Third, the whiteness and sharpness in architecture is currently achieved with all kinds of chemicals, plastics and treatments in building materials which many of the architects cannot even identify. Considering that, is it such a foreign idea to use grown natural materials?

## REED, SEAWEED, HEMP, WOOD AND PROCESSING GROWN MATERIALS

Rethinking materiality does not necessarily mean that completely new technologies or techniques have to be invented. The vernacular building techniques can be studied. The innovation can be the way the material is used in contemporary context. As seen in Figure 64, the materiality, texture, thickness, density of the surface and earthy colour of the thatched roof and facades define the distinctive character of *The Wadden Sea Centre* on the Western coast of Denmark, designed by Dorte Mandrup. The abundant and fast growing local reed is used to connect the building into the local region, as the thatching involves traditional craftsmanship (Dorte Mandrup A/S, n.d.). In fact, the chosen material and technique is quite forward-looking in this specific context. The knowledge of the material, its properties like durability, maintenance and weather resistance, already exists concerning the complex ecosystem on the shore of the Wadden Sea. Thus, the reframed question of resource scarcity can be, how to build with growing, renewable materials? This project suggests that we learn from the tradition and apply that knowledge into today's projects.

Architects are often focused on the material organisation on land, but the changes in ocean and seascapes are severe. Acidification, eutrophication, sea level rise and collapsing ecosystems are symptoms that demand urgent attention. Designer and professor at Aalto University, Julia Lohmann has addressed these challenges by creating sculptural interventions to provoke discussion and harness collective imagination to promote sea health (Lohmann, n.d.; Toivola, 2020). Lohmann works with seaweed in her installations and uses the material as a medium to raise awareness and spark discussion. This is another abstract dimension of materiality.

Lohmann has created a collaborative and participatory practice called *Department of Seaweed* during her residency in Victoria and Albert (V&A) Museum London in 2013, where the sculptural seaweed structures were explored and studied (Lohmann, 2017, pp. 57-58). *Oki Naganode* (2013) and *Hidaka Ohmu* (2020) (see Figure 68) are pavilions made from rattan and aluminium frames and dried seaweed. Translucent, organically shaped seaweed sculpture *Oki Naganode* (see Figure 71) has been on display at V&A Museum.

# WHAT IF THE BUILDING
MATERIALS WERE GROWN?

WOOD
↓

MYCELIUM

REED →

HEMP















SEAWEED

SILK
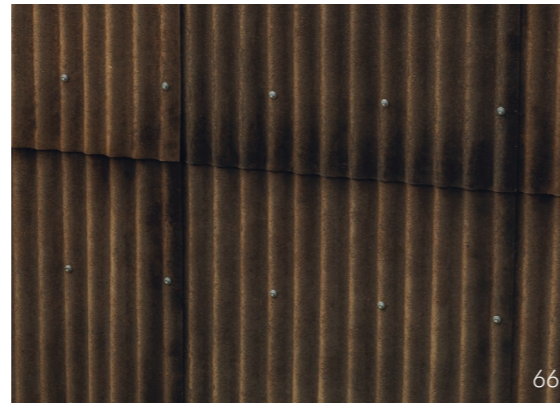
**Figure 64.** Dorte Mandrup, *The Wadden Sea Centre,* 2017.
**Figure 65-66.** Practice Architecture, *Flat House,* 2019.
**Figure 67.** Noora Yau and Konrad Klockars, *Shimmering Wood,* 2021.
**Figure 68.** Julia Lohmann, *Hidaka Ohmu,* 2020.
**Figure 69.** The Living, *Hy-Fi,* 2014.
**Figure 70.** Neri Oxman and the Mediated Matter Group, *The Silk Pavilion II*, 2019-2020.

Material dimension of architecture can be cultivated naturally or grown with engineering the process artificially.
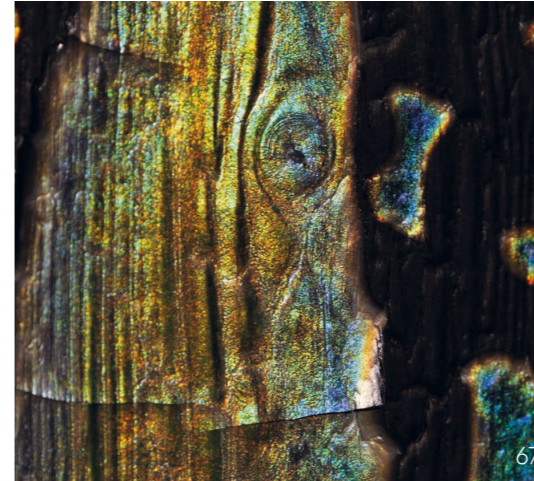
The sculpture is made from 12 x 90 cm seaweed panels which were glued into a steady rattan and aluminium frame. The frame ensures that the self-tightening process of drying seaweed do not deform the shape. The guiding principle in the design is to let the material inspire and define the shape and aesthetic decisions as well as to learn from working with the seaweed. (Lohmann, 2017) The organic shapes, colours changing with time and light and leathery quality of the material creates a unique structure which allows the materiality of the seaweed to be in the focus.

Lohmann (2017, pp. 72-73) defines the collaborative method of *co-speculation* as something that aims to gain a variety of visions of the future by using one material as a context and inspiration. Not only is the material used to create something concrete and innovative in architectural scale, but it is also used in an abstract way to encourage the public audience to participate in the discussion. To me, this is exactly what Dunne and Raby call for, when encouraging designers to think through design.



**Figure 71.** Julia Lohmann, *Oki Naganode*, 2018.
*Oki Naganode* is built in architectural scale from seaweed, rattan and aluminium frames.

A grown material can be mixed with other ingredients to produce a building element. Practice Architecture has tested a substituting material for concrete and plastics in a prototype project *Flat House* (2019). The house is made from prefabricated hempcrete panels. As seen in Figure 65-66 exposed interior surfaces of the panels are left without finishing surface treatments and the hemp fibres can be seen from the mixture of hemp, lime and water. The cladding on the facades is made from pressed sheets of hemp and sugar-based resin from agricultural waste. (Practice Architecture, n.d.) The hemp-based products are another way to use grown, local material. The prefabrication of the panels is an attempt to make the sustainable building material fit into the current building processes by ensuring the fast assembly with modularity.

The futures studies references suggest that the wood is future. As a traditionally used growing material, the existing knowledge is vast especially in Finland, in a similar way the thatching technique is familiar in Denmark. However, as the futures studies reports suggest, the forests have to be harvested sustainably, promoting biodiversity before turning them into commercial forests. New wood products can offer an efficient and non-toxic ways to use timber in architecture. ChemArts laboratory in Aalto University have been researching material qualities of wood and wood products and as a result succeeded in creating shimmering, flexible and transparent wood as well as different textures as seen in Figure 67 (Kääriäinen et al., 2020, pp. 57-128, 175).

**FUNGI, SILK AND THE GROWN FORM**

Reed, seaweed and hemp are examples of materials grown without intervening the process itself, but as building materials they are further modified through mixing, pressing, thatching, and taking something out or adding something into the material. However, another way to approach growing materials is actually growing a desired shape by using technology and science to intervene in the natural process.

*Mycelium* is a root of a fungus which can be fed with synthetic or organic waste in a mold of desired shape. While consuming the waste, the mycelium dries into a shape and can be used as a building material. Research-oriented design and architectural practice The Living have produced mycelium bricks to build a structure called *Hy-Fi,* as seen in Figure 69, on the yard of MoMA PS2 in New York City in 2014. The qualities and properties of the material can be controlled by using different kinds of waste and the process does not require an external source of energy. The bricks are compostable and thus no waste is left behind. (The Living, n.d.) A brick is a perfect shape to test the material as it is scalable and modular.

The most otherworldly example of engineered nature, as seen in Figure 70, *the Silk Pavilion II* (2020) is up to par with the spiders fed with nanocarbons. It is an experimental research project by the Mediated Matter research group which is working for Massachussets Institute of Technology. The project has

started with a first prototype, *the Silk Pavilion I* in 2014, which explored the ways to combine digital and biological fabrication to produce a structure by using the silk fibres produced by silkworms on architectural scale (Oxman et al., 2014, p. 249). The ethereal, light and translucent structure illustrates how design can learn from nature. In addition, the natural processes can be encouraged to create designed shapes and textures. The Silk Pavilions have been an engineering, biological and architectural design problems all at once and have required expertise from several disciplines and transdisciplinary collaboration to be successful.

The research group had to study the behaviour of a silkworm and pay attention to silk production and the impacts of environmental changes in light and temperature. This was done by using magnetic motion detectors attached to the worms and monitoring the movements in real time in three dimensional space. After a thorough study of these aspects, the group developed an algorithm and a digital tool for generating optimised designs for a pavilion, which used silkworms almost like 3D-printers and control the density of produced material. Primary structure of 26 panels was created with silk thread around an aluminium frame by using a *Computer Numerically Controlled (CNC)* machine and then assembled into a three dimensional dome without the frames by using tension lines. Secondary structure was created by 6500 silkworms on top of the scaffolding structure. (Oxman et al., 2014, pp. 250-254) The project also reveals how much knowledge can be produced by solving many small problems by designing.  Silk pavilions are examples of how architectural skills and knowledge can be shared with other fields of research.

The new materials and experimentation is a complex subject, because transdisciplinary collaboration is necessary in order to gain insight. Nonetheless, they are important ways to create new innovations, explore the boundaries of the discipline and ask questions about the world we are living in. They are like the symbols of change: they represent the active attitude toward exploring options and solutions to climate crisis and resource scarcity while asking fundamental questions about the relationship between a human being and nature.

The sneaky greens offers designated places for nature to take over and to 'do its own thing'. Engineered nature however is about taking control over nature, processing it further into shapes and man-made objects. This might look like optimising the hempcrete prefabricated panels to a fast building process like in *Flat House* or grow the mycelium bricks to assemble a structure. On the other hand, it can mean learning from nature, like the organic shapes of the *Oki Naganode* and *Hidaka Ohmu*. Inherently, they create abundant material for architectural imagination.

# 4.0 DISCUSSION

The findings from the theories of change and the changing architecture are the surprising connections and contradictions between the future and architecture. Common themes are the problem-solving model of practice moving toward the emphasis on process, more socially, culturally and environmentally inclined practice, the voices of architects in the discussion of shaping the future and the thresholds of architecture where the new architectural innovations are emerging.

The architectural images of the future I have collected and represented in this thesis construct a very different picture than the techno-utopian, shiny, clean and fast-paced image the modernist project offered us. My findings are much more socially, culturally and environmentally inclined, celebrate the complexities and even emphasise the messiness of life and the importance of slowing down.

## PERSPECTIVE

At this point, I would like to return to the problem-solving model of practice after the projects and practices have been introduced. I have questioned whether the problem-solving model of practice is too one-dimensional solution for complex problems. However, problem-solving as a characteristic way of working in the real world as an architect, has its place in our toolkit. The problem-solving connects the abstract realm to reality. As the future-oriented practices suggest, the framing of the problem and finding a solution to that is just one part of the design process. This requires an architect to acknowledge the scales beyond the immediate task at hand. Conversely, a sense of constant urgency emphasises the need to complete one task after another while losing the broader perspective. Perhaps slow living can teach us something about the practice. Focusing on what is relevant and why, can create a clear sense of purpose and vision.

The focus on the outcomes in the present discourse can be seen as another force narrowing down the perspective of the practice. At some point during my process of writing this thesis this was something I realised I had to critisise myself as well and question my assumptions I had learnt from working experiences and studio projects focused on competition entries. Although my interest was in the practice from the beginning, I was still very much stuck with the idea that I needed to produce relevant knowledge about the future for the practice, not about the practice itself. I reckon that was due to the emphasis on the outcomes in the field rather than the process. It was the moment when I realised that the practice itself, the processes, the thinking patterns were something that can be changed, that studying the architectural futures started to make more sense. This sort of criticism was an underlying

thought. The further I read the research material, I realised that the change was created already on a systemic level of thinking. Fundamentally, there is a remarkable difference in changing something with conscious action based on knowledge rather than reaction to the external forces of change. This tension between change initiated from the internal thinking process rather than the change caused by external forces defines the future of practice.

## ROLE

The theories of change and many of the represented future-oriented projects and practices have one fundamental common factor: approaching architecture not as a product, but as a process. Thus, the role of an architect becomes problematic, when we approach a project from a problem-solving perspective. We are assigned a preconditioned, preframed problem, which we solve and then move forward. But what if an architect was involved in the process longer? I do not mean an architect as an overseeing authority, but as a part of the community, carefully listening and collaborating with the stakeholders, like *R-Urban* suggests.

The second finding from the research suggests that there is a will to use architecture for socially, culturally and environmentally conscious design projects. Furthermore, the references suggest that there is existing confidence that the agency of architecture could and perhaps should be used to have an impact in society. Hence, the role of an architect in society is challenged. An architect can be an activist, a mediator, a collaborator or a translator. Given the generalist nature of the profession, can the most radical role sometimes be the diplomat? Addressing the contingent nature of the discipline emphasises the importance of the connections with other disciplines and stakeholders. It can be difficult to have an impact as an independent activist, but the change can be initiated through existing connections.

Diplomacy would be a tool to serve the chosen values. In other words, it is about playing with the cards we are handed and trying to use the system alternatively to promote positive change. Business is something architects are not always willing to discuss although it is the defining element of the practice

today. At first, I did not focus on the criticism toward the capitalist system, but during the process it became a relevant theme. The degrowth in architecture pointed out the inconsistencies and conflicts between the pursuit of financial growth and architecture aiming toward social and cultural growth. Rotor and Assemble are practices, which have found a way to operate as architects according to their own terms within the existing system. Rotor have created a business model around a problem and Assemble have used their values and unique way to organise themselves as a leverage to negotiate different aspects of the projects.

## VALUES

The values are closely connected to the social, cultural and environmental emphasis on the practice. I was surprised how significant part values actually became in this thesis. Although, as I reflected back, I understood that they were there from the beginning. The beaten path that was shown to me as a practicing architect seemed not to fit into my own valuesystem, because that often serves for the purposes of economic growth. I felt frustrated seeing architects willing to create interesting, welcoming, inclusive spaces with social and cultural dimensions, but getting stuck with the economic pressure to produce efficient buildings which would generate as much revenue as possible for the client. The efficiency in these cases was measured in short-term monetary profits. I was wondering if that really was the future of architecture?

Architects are brilliant organisers. They find connections between things and are able to deal with abstract concepts with concrete terms. To me, this is a perfect combination to understand, mediate and vision contingency and future, which can be communicated to other people. It is about finding the connections and putting them into a comprehensible form, but instead of neglecting the values and external changing forces, they are taken into account and clearly stated. Why would architecture not be about social, cultural and political agency? Frankly, I think that shift would make the practice, designing and briefs more interesting.

The realist in me is wondering how can the transition from architecture as a generator of capital growth to a facilitator of social and cultural growth take place in reality to the extent that would make a difference. After all, architects are a part of the same society, the system, where the mortgages, loans and rents have to be paid and groceries bought. How can we work for the ecologically, socially, and democratically meaningful initiatives, when the architectural work for that is not always valued monetarily? I could accept that working pro bono could be a transitional, temporary solution. Vision could be that somehow some of these initiatives would succeed to create other ways to gain revenue or the initiatives would be funded by municipalities, cities, governments or even by crowdfunding.

## SHARED FUTURES

The further I researched and gained knowledge about various subjects, it became clear to me that however objective I try to be, in the end the power of this kind of topic is in adding another voice into the discussion. My subjective perspective is thus informed by being open and curious about the things around me and trying to understand other people's insights and opinions. After all, the conclusions and connections I make, are defined by my own valuesystem, environment and gained knowledge. Nonetheless, as the theories of change and the examples suggest, that is not necessarily a sign of poor judgement, but on the contrary, a sign of awareness of the power structures and connections. In other words, what we can do as architects is to try to understand the world and people around us a bit better. The discourse inside the discipline should sooner or later extend outside of the discipline.

Again, if I returned to the theories of change, I learnt that the future which is now sold to us is told by certain people with certain biases. Thus, new voices, alternative voices, minority voices and creative voices do matter in shaping the future. In the end, I think the synthesis of all the qualities architects have, the artistic expression, the understanding of the social dimension, the will to increase the quality of life with spatial and material organisation, is the reason why our voices should be heard in the discussion of the futures we are facing

and that participation could futher secure architecture's agency in society and opportunities to impact the future

The theories of change and the body of examples introduced in this thesis reveal how dependent discipline architecture is. Architecture is political. It is technical and technological. It is social and cultural. It is artistic. But architecture is not any of them without others. Different aspects of the discipline can be studied and theoretisised separately, but when the practice is dealing with the real world, the contingency is evident. The external forces shape the practice and practice shapes the external world. However, acknowledging those connections also exposes the ways architecture can impact the lived environment.

This thesis is defined by the words of uncertainty: may, might, would, could, should, can, probably, most likely, perhaps. However, these express the open-ended nature of futures projects. There are always ways to change something, new policies can be obtained, bottom-up initiatives started or a black swan might change the direction completely. In the introduction I describe the BAS as a place for asking questions and allow creative minds to imagine alternative futures. The school itself is an example of an open-ended project. It is being transformed constantly and the school transforms the students. The open-form as a philosophy creates a social, cultural and experimental platform where collaborators and lecturers outside of the discipline are invited to share knowledge.

When an architect shapes the physical environment, they use the power to make decisions on the behalf of citizens. This is why I think architects should be educated first and foremost as critical thinkers, active listeners and curious observers. As I have discussed before, the design practices already offer us tools to develop those skills, like speculative design. Architectural education and schools as places providing a platform to ask questions, speculate the future and imagine alternative worlds is important. As the futures unveil with new challenges the most important quality of any professional is first to ask the right questions and then try to find the right solutions. The ability to transform abstract to concrete is the most powerful skill when the purpose is clear and answers to a relevant question.

This thesis was written completely during the Covid-19 pandemic. Hence, the circumstances were very different from what I had anticipated from this process. I was not able to visit exhibitions, my tutoring sessions were fully online and travelling was not an option. However, me and other people adapted quickly. As working and studying remotely, I missed having those unexpected, spontaneous discussions and brainstorming with my fellow students and colleagues. These exceptional times accelerated many changes and revealed possibilities. The online tools for meetings and working remotely all existed but had never been used to such extent before. The pandemic was and still is a social experiment which has already changed many things we deal with daily.

Although it was not always easy to find the focus and freedom during these times, the transitional times also opened many opportunities. Digitalisation offers many platforms to share and collaborate. It has been exciting to see how the international community of architects have gathered together around the virtual platforms to share knowledge during the pandemic. That is a proof that the networks exist and there is a will to change the practice. I would not have been able to access so much information about exhibitions and lectures than before the pandemic. When the physical world went into a lockdown, the virtual world opened up. The pandemic revealed how fast things can change.

The movements that have gained momentum recently, like *Architect's Declare* or *New Bauhaus*, are encouraging examples of the shifting mindset. Yet, as the theories of change inform us, shaping of the future requires the choice, the plan of action, and people who actually make the choice. It remains to be seen if these movements encourage architects to make those choices and act as agents of change. In addition, the platforms would make it easy to share the knowledge across the disciplines and avoid the siloing effect. The moment we decide to reduce the domain of the architectural practice to those controllable aspects by emphasising the professional authorship, we give up the leverage to impact and shape the future. This is a missed opportunity, when the multi- and interdisciplinary, collaborative nature of the profession would offer us new ways to work and impact.

## THRESHOLDS

I decided to take this mammoth of a task to try to understand future phenomena changing the architecture. The delimitation of the scope of the thesis was the quintessential question: too narrow perspective would simplify the complexity of the future too much, but too wide perspective would not offer anything relevant to discuss. This was ongoing pushing and pulling and trying to decide what to include and what not. I had to take societal forces of change into consideration, but still offer inspiration and ways to achieve a positive change. I had to judge what is relevant for architects with the tools and skills we have. How are the boundaries of our discipline changing in order to keep our role in society relevant? The generalist approach I decided to obtain allowed me to explore the phenomena on a wider perspective and thus make connections that perhaps I had missed by choosing one topic to study with a specialist approach. The ebb and flow between the scales from micro to macro and architecture to futures studies was sometimes difficult. Every now and then I found myself diving too deep into one single technology or a movement. Therefore, I do think there is a lot to be explored further, even with a specialist approach. All the phenomena and themes could be further studied even with a specific futures studies method, such as Delphi interviews or future workshops.



**Figure 72.** Forensic Architecture, *Dataset visualisation: Rwanda,* 2020.
Forensic Architecture studied mobile phone data security violations in a contact-tracing software during Covid-19 pandemic.

Gathering the research material forced me to test the boundaries of architecture and my own assumptions of architecture. What is architecture and what is not? What could be future architecture? I had to leave out some fascinating examples, which did not fit into any of my themes or categories. One of these projects is Forensic Architecture, which analyses crimes with architectural thinking. Another example is Plethora Project's *Block'hood,* a game which deals with urban

ecosystems. These kinds of practices are free to experiment and innovate however they want to because they have detached themselves from the architectural discourse. They do not have to justify their projects as architectural practice. Nevertheless, I do think they reveal something interesting about the discipline of architecture as well. What if a building was designed as a game?

The discussion of the emerging architectural phenomena also exposes the thresholds that are not clearly defined at the first place. In addition, the futures studies and speculative design allow researchers and designers to use their imagination and to be creative, even as far as the absurd scenarios. The common theme to the emerging architecture is that it is often labeled as an experiment, art installation or prototype. These labels almost grant a licence for an architect to test, fail and learn. They allow imperfections and interventions to be part of the practice.



**Figure 73.** plethora-project, *Block'hood,* n.d.
*Block'hood* is a game where the ecological balance is tried to be maintained while the urban neighbourhood is built with a catalog of blocks.

Many practitioners showcased in this thesis have found a crack in the system where they have been able to create alternative practices, which suggest alternative ways to operate. It was encouraging to find architectural theorists who acknowledged the inconsistencies and dilemmas in the existing practice. In addition, the practices and projects, the alternatives, were the evidence of the change I had been looking for. All of these examples shifted my own perspective as well.

The fundamental insight what I gained through the process of writing this master's thesis is actually quite simple: nothing in this contingent world is in black and white. My process was messier than I thought, but it is in alignment with the theme. How can you approach uncertain future and architecture within the scope of a master's thesis? However, I did find this thesis relevant and important for my own journey. These questions of the

future and architecture were something I needed to find answers to myself, to understand both my own knowledge and skills I had built during these years studying architecture and also how my own future path could look like, or what steps I could take. Aalto University has offered me many opportunities to create a path of my own and develop new skills and mindsets, such as taking futures studies courses. The experiences and people I have met along the way have shaped the way I approach architecture. Furthermore, as I tried to gather my own thoughts together, I found my own mindset shifting toward something akin of an agent of change with all the knowledge I had now gathered. As I recognised that, I also understood that this is just the beginning of an open-ended project.

# VOCABULARY

**4D-PRINTING:** Printing something three-dimensional which changes when exposed to changes in the environment, such as heat or moisture. The material has thus a quality compared to a memory.

**ACTIVE AGEING:** Promoting well-being and independent life during the later years in life.

**AI:** Artificial Intelligence, further divided into General AI and Narrow AI. A machine making a decision or judgement independently based on the input it is given. General AI refers to an independent artificial intelligent, which is to a certain extent out of the control of the human input. General AI is currently more of a philosophical question rather than reality. Narrow AI, such as machine learning, is dependent on the existing technology and human control.

**ALIGNMENT:** Aligning decision-making, actions, behaviours and approaches to value-systems and visions.

**ANTHROPOCENE:** A time period which started after the holocene era. Anthropocene is dominated by human impact on earth.

**ANTHROPOCENTRIC:** A human-centred perspective.

**BIFURCATION:** Forking paths, a branch dividing into two parts.

**BIOLOGISATION:** A general force of change defined by a technology which is learning from biology.

**BLACK SWAN:** An unpredictable event, a wild card.

**BLOCKCHAIN TECHNOLOGY:** Decentralised technology system. A chain of records distributed to a network, where the records cannot be altered without modifying all the previous ones on the chain and accepted by the other parts of the network. The system is more secure because the information can be compared to the copies of the records in the network.

**BUSINESS AS USUAL:** A scenario based on current circumstances projected into the future without drastic changes.

**CHAOS THEORY:** A state of organisation, a mathematical theory. A theory understanding the nature of uncertainty. The present can be forecasted into future but the future cannot be predicted. The forecast is limited by the existing knowledge while the system is expected to change in chaotic, random ways in the long term.

**CIRCULAR ECONOMY:** An economic model based on prolonging the lifecycles of materials, including models of services, like renting leasing and sharing.

**CITTÀ SLOW:** Slow city, a city organised according to the principles promoting slow living.

**COMMONS:** Shared resources of a society or a community.

**CROWDSOURCING:** Producing, gathering, modifying, altering and developing knowledge or resources by a large group of contributors. For example, crowdfunding is fundraising with a power of community.

**DARK DESIGN:** Designing something undesirable, dangerous or repulsive to reveal problematic nature of presumptions and possibilities.

**DEGROWTH:** A theory revealing the contradictions between the capital growth and the social and cultural progress.

**DYSTOPIA - DYSTOPIAN:** Undesirable, unimaginable image of world and society.

**EXPLORATIVE SCENARIO:** A scenario, which is constructed with past and present trends extrapolated to the future.

**FUTURIST:** A researcher of the field of futures studies.

**FUTURISM:** Early 20th-century Italian avant-garde group of creatives.

**GAMIFICATION:** Using the strategies and ideas from games in other environments to learn, teach and engag.e

**GEOENGINEERING:** a technology intervening the climate

**HEMPCRETE:** concrete-like mixture of hemp, lime and water

**HYDROPONIC CULTIVATION:** A cultivation technique which only requires water, nutrients and certain wavelength of light. Hydroponic cultivation can be organised vertically with LED-lights in places where daylight cannot enter.

**HYPERLOOP:** A transportation technology which uses magnetic power to transport levitating capsules from one place to another.

**IMAGE OF THE FUTURE:** Description of a future scenario, which is based on the existing knowledge.

**INTERGENERATIONAL ARCHITECTURE:** Architectural spaces which are inclusive and meet the needs of different generations and encourage them to be socially engaged with each other.

**IoT:** Internet of Things, digital duplicates of physical things, devices and objects producing data connected to internet with embedded sensors and software.

**MEGATREND:** A phenomenon or multiple related phenomena which are causing significant changes in society. Megatrends can cause different consequences in different places and include surprises.

**MULTILOCALITY:** Living and working in multiple places and the mobility between them.

**NBS:** Nature-based solution, promoting biodiversity and alleviating effects of climate change with solutions based on nature, like green roofs, especially in the urban context.

**NFT:** Non-Fungible Token, an digital unique object or thing, like an artwork, which is minted in to blockchain and traded in cryptocurrency.

**NORMATIVE SCENARIO:** A scenario, which is created retrospectively from future to the present.

**OFF-GRID/MICRO-GRID:** A living situation or place with energy solutions outside of common infrastructure or shared small scale infrastructure

**OPEN-SOURCE:** Resources shared and released for free download, modification, adaptation and development.

**SERVICIFICATION:** shifting the manufacturing and trading toward services, such as MaaS, Mobility as a Service

**SHARING ECONOMY:** an economy model based on shared goods

**SHRINKING CITIES:** Cities with decreasing and ageing population and the ramifications for the urban fabric occuring due to structural changes in population.

**SLOW LIVING:** Focusing on the mundane tasks to create a sense of abundance of time. Slow food and slow cities are part of slow living movement.

**SMART HOME / CITY / BUILDING:** A place which produces and uses data for future adjustments, modifications, maintenance, design, entertainment or services. A place that can be monitored and changed remotely and digitally.

**SPECULATIVE DESIGN:** Designing something not necessarily realistic or pragmatic, designing visions for a hypothetical scenario.

**SUPER-ELDERS:** Senior citizens living over 105 years old.

**SYSTEM:** A organisation of connected parts of a whole, which are working toward a common goal. A system can have identifiable subsystems.

**SYSTEM DYNAMICS:** A model or an abstraction of reality or phenomena and the interrelated connections.

**THINK TANK:** An organisation researching futures.

**TRANSITION DESIGN:** A strategy to design transitional times, which is taking designer's mindset and values into consideration and acknowledges the design process as iterative and self-learning, open-ended project.

**UBIQUITOUS SOCIETY:** A society where information, computers and communication can be accessed everywhere and all the time.

**USED FUTURE:** Making decisions according to a vision defined by someone else or during another time according to their values.

**UTOPIA - UTOPIAN:** Desirable, ideal image of world or society.

**VISION:** An aim and the strategy for a desired image of the future.

**VISIONARY ARCHITECTURE:** Architectural vision for a hypothetical future, not necessarily realistic and is often questioning and critiquing the existing practice.

**WEAK SIGNAL:** A phenomenon which often challenges a megatrend, but is yet to have a significant status in society, exists only temporarily and can develop to a trend or megatrend or disappears.

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