

WEAK SIGNALS 2022

Stories about futures

Mikko Dufva & Christopher Rowley



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Weak signals 2022 – stories about futures

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Author: Mikko Dufva ja Christopher Rowley, Sitra

Sub-editor: Anna Solovjew-Wartiovaara, Sitra

Visual design: Topias Dean ja Eve Nieminen, Sitra

Layout: PunaMusta Oy

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Foreword

The Covid-19 pandemic that began in spring 2020 showed concretely how the future can be very different from what we had thought. As crises often do, the pandemic raised the question: how well do we know how to prepare for and identify different surprises? When we take a narrow, cautious or short-term view of the future, we easily ignore phenomena such as pandemics and refugee crises.

But current surprises are not only isolated crises. The impacts of crises are far-reaching and unexpected. The unpredictable interlinking of big and small issues is increasingly leading to unforeseen consequences. As uncertainty grows, the future can seem more blurred than before. Could we widen our horizons and become more sensitive to identifying emerging and existing phenomena?

Through our foresight work, we want to increase the understanding of various potential future developments and improve the preparedness of people and societies for future changes. For example, we know from the Futures Barometer 2021 that the more likely developments described by megatrends are relatively well known. But to be better prepared to think about and influence the future, we must not only broaden our thinking about the future, but also to make future knowledge more tangible and its impact more immediate at the level of people's everyday lives. In general, the future does not surprise us because there is not enough information available, but because it can be difficult to relate it to today's choices and actions.

The future also surprises us because of its specificity. It is not just about wild cards or black swans. The effects of major megatrends already underway will also come as a surprise to some of the population, be it the ecological crisis, demographic development or power-related trends.

This study encourages us to reflect on weak signals in different everyday contexts, thus making it easier to internalise future knowledge and take it into consideration. We will have succeeded increasingly more people stop to ask: what if?

Katri Vataja

Director, Foresight and Strategy
Sitra

Summary

There are bigger changes ahead than we want to admit. We live in a postnormal era of surprises, when old visions of the future no longer suffice. We need different narratives about the future, challenging current ones.

Weak signals help us to tell these different stories of the future. A weak signal is a first symptom of change or sign of an emerging phenomenon that could be significant in the future. Weak signals are surprising things that actually happen and challenge current thinking. The unexpectedness or strangeness of a weak signal depends on the interpreter – what are surprises to some are not to others.

If you only gaze at trends, you can get caught up in ongoing changes and become blind to the surprises. Weak signals complement trends not only by introducing more surprising development paths for examination, but also by guiding us to think differently. Where trends lead us to think in terms of continuities and ask “what next”, weak signals emphasise discontinuities and encourage us to ask “what if”.

In this study, we have sought to bring weak signals, with all of their weirdness, to the everyday level by presenting a number of “what if” questions that stem from the signals. We have not only wanted to outline not only what futures the weak signals tell us, but also what it would be like to live in those futures. This is why the report is structured around different places and situations. The signals are interpreted in terms of home, workplace, nature and trips to town, decision-making and the digital metaverse. Future stories are also told about each place in addition to the signals and their interpretation.

This report is not an exhaustive overview of all possible topics. We therefore encourage everyone to continue to observe and interpret weak signals and discuss other futures. To support this, the report concludes by describing how to get in your own contemplation of weak signals. The appendix describes in more detail the progress of Sitra’s weak signals work, the choices made and the theoretical background.

Tiivistelmä

Edessä ja käsillä on suurempia muutoksia kuin haluamme myöntää. Elämme postnormaalia yllätysten aikaa, jolloin vanhat näkemykset tulevaisuudesta eivät enää riitä. Tarvitsemme toisenlaisia tarinoita tulevaisuuksista – ja nykyisten tarinoiden haastamista.

Heikot signaalit auttavat kertomaan näitä toisenlaisia tarinoita tulevaisuuksista. Heikko signaali on ensioire muutoksesta tai merkki nousevasta asiasta, joka saattaa olla tulevaisuudessa merkittävä. Heikot signaalit ovat yllättäviä ja nykyistä ajattelua haastavia, todella tapah-tuneita asioita. Heikon signaalin yllättävyys tai outous riippuu tulkitsijasta – joillekin yllättävät asiat eivät ole sitä toisille.

Jos tuijottaa vain trendejä, voi jäädä meneillään olevien muutosten vangiksi ja tulla sokeaksi yllätyksille. Heikot signaalit täydentävät trendejä paitsi tuomalla yllättävämpiä kehityskulkuja tarkasteluun, myös ohjaamalla toisenlaiseen ajatteluun. Jos trendit ohjaavat ajattelemaan jatkuvuuksia ja kysymään ”mitä seuraavaksi”, heikot signaalit korostavat epäjatkuvuutta ja kannustavat kysymään ”mitä jos”.

Olemme tässä selvityksessä halunneet tuoda heikot signaalit kaikkine outouksineen arkipäivän tasolle esittämällä joukon signaaleista kumpuavia ”mitä jos?” -kysymyksiä. Olemme halunneet paitsi hahmotella, millaisista tulevaisuuksista heikot signaalit kertovat, myös mil-laista näissä tulevaisuuksissa olisi elää. Tämän takia selvitys jäsentyy erilaisten paikkojen ja tilanteiden ympärille. Signaaleja tulkitaan kodin, työpaikan, luonnossa ja kaupungilla käynnin, päätöksenteon ja digitaalisen metaversumin kannalta. Jokaisesta paikasta kerrotaan signaalien ja niiden tulkinnan lisäksi myös lyhyitä tulevaisuustarinoita.

Tämä selvitys ei ole kattava katsaus kaikkiin mahdollisiin aiheisiin. Siksi kannustammekin kaikkia jatkamaan heikkojen signaalien havainnointia ja tulkintaa, sekä toisenlaisista tulevai-suuksista keskustelua. Tämän tueksi selvityksen lopussa on kuvattu, miten omassa heikkojen signaalien pohdinnassa pääsee alkuun. Liitteessä on kuvattu tarkemmin Sitran heikot signaalit työn eteneminen, siinä tehdyt valinnat ja niiden teoriatausta.

Sammanfattning

Vi står inför stora förändringar – större än vad vi egentligen vill medge. Vi lever i en post-normal tid av överraskningar där de gamla framtidsvisionerna inte längre räcker till. Vi behöver annorlunda framtidsberättelser – och de nuvarande berättelserna måste ifrågasättas.

Svaga signaler hjälper oss att berätta om dessa annorlunda framtidsscenarier. En svag signal är det första symptomet till förändring eller ett tecken på ett möjligt tema som kan komma att bli betydande i framtiden. Svaga signaler är något överraskande som händer i verkligheten och som utmanar våra nuvarande tankesätt. Hur överraskande eller absurd en svag signal är beror på vem som tolkar signalen – det som är överraskande för en är inte överraskande för en annan.

Om man stirrar sig blind på trender kan man bli fångad av pågående förändringar och missa det som verkligen överraskar. Svaga signaler kompletterar trender genom att presentera mer överraskande utvecklingsprocesser för observation, men också genom att styra oss att tänka på ett annat sätt. Om trenderna styr oss att tänka på kontinuiteter och fråga ”vad händer härnäst”, framhäver svaga signaler diskontinuiteter och uppmuntrar oss att säga ”tänk om”.

I den här utredningen har vi haft för avsikt att ta de svaga signalerna med alla deras märkligheter till en vardaglig nivå genom att ställa de ”tänk om”-frågor som signalerna väcker. Vi vill gestalta de framtidsvyer som de svaga signalerna berättar om och fundera på hur det vore att leva i dessa framtider. Därför struktureras här utredningen kring olika platser och situationer. Signalerna tolkas ur hemmets, arbetets, naturens och stadens, beslutsfattandets och det digitala metaversumets perspektiv. Utöver signalerna och deras tolkningar presenterar vi också korta framtidsberättelser om varje ställe.

Den här utredningen är inte en heltäckande översikt över alla möjliga teman. Därför vill vi uppmuntra alla att fortsätta observera och tolka svaga signaler och att diskutera annorlunda framtidsscenarier. För att stödja detta ger vi instruktioner i slutet av utredningen om hur man kan komma i gång med egna reflektioner över svaga signaler. I bilagan beskrivs mer ingående hur Sitras arbete inom svaga signaler framskrider, vilka val vi gjorde och vilken teoribakgrund de svaga signalerna har.

Introduction

Imagine you had a time machine that can take you ten years into the future or past. You jump aboard and head into the future. As you travel through time, you look at the way the world is going. What do you think will happen in the next ten years?

Next, imagine taking the same trip into the past. Along the way, you will flash past events such as the Covid-19 pandemic, massive forest fires around the world, Brexit, the Trump presidency, Hong Kong protests, #metoo, fidget spinners, Pokemon Go, the euro crisis, the Paris Agreement, ISIS, the occupation of Crimea, Ebola, and the Snowden leaks. In the past, you meet a friend who wonders about the Arab Spring and the new iPad and wants to hear from you what to expect during the next ten years. What will you say?

Accurately imagining the future is, naturally, more difficult than remembering the past. We easily think about the future as a continuation of the present, in which things are roughly the same, just faster, bigger and more efficient. We imagine the future mainly in terms of changes brought about by technology, often with other things remaining the same. Images of the future relating to societal and social changes are underrepresented, and changes in values and mindsets, behaviour and action are harder to imagine

And yet, it is at this moment that the recognition and interpretation of surprises and discontinuities is emphasised. Futurists talk about postnormal times when surprises and conflicts rule and the concept of normal is increasingly useless (Sardar 2010, Sardar & Sweeney 2016). We cannot just think that everything will continue unchanged, but need to challenge our assumptions about the present, imagine different futures and work towards better ones.

By challenging the normal, we open the door to other points of view. The normal is always open to interpretation and change, and excludes many perspectives and voices from the debate. In debates about the future, the normal is often seen as a dearth of options, a focus on probabilities and listening to a narrow range of views. How can we challenge these while expanding the discussion about the future?

Challenging can bring to mind resisting things. But that's not what it's about that; it's about broadening our thinking and taking more perspectives into account. Challenging existing assumptions and views of the future, may involve criticism, but it can open up new angles. Challenging does not mean rejecting everything that exists, but creating space for rethinking.

Nor is it not about denying facts. The climate crisis or the pandemic will not go away, no matter how much we challenge them. Challenging is really about taking facts seriously. Climate futurist Alex Steffen (2021a) has summed up the climate crisis by saying that we are not ready for what has already happened. This applies beyond the climate crisis, as the impacts of biodiversity loss, digitalisation and global democratisation are not yet fully acknowledged. We want to stick with the old and close our eyes to the change that has already taken place, because it forces us to transform our lifestyles.

Change is scary, especially if we don't stop to imagine what life would be like after it. On the other hand, change can also feel uncomfortable and inconvenient if you feel that things are fine right now. We are addicted to continuity. We are hooked on the way things are, even though we have become acutely aware that it is not in the best interests of ourselves or our planet. How could we wean ourselves from this addiction?

We need different stories about futures – and a challenge to the current narratives. Weak signals could help with this.

What is a weak signal?

Weak signals have been given several definitions over the years (van Veen & Ortt 2021). In this study, we use the definition of futurist Elina Hiltunen, where a weak signal is the first symptom of change or a sign of an emerging phenomenon that may be significant in the future (Hiltunen 2010). It is something that has actually already happened but that somehow seems strange, surprising, ridiculous or scandalous to us.

A weak signal can be interpreted as a sign of a bigger potential change. A weak signal can be considered as having three parts (Hiltunen 2008):

1. The thing or phenomenon itself
2. The signal – a news item, image, service, object, story or event – that tells us about it
3. The interpretation, meaning how the signal is received, how it is linked to the interpreter's own insight and worldview and how it is used.

It is interpretation that makes the signal weak. Surprisingness or strangeness depends on the interpreter, and it could be thought of as distance: how far the signal is from the perceiver's interpretive framework, meaning how well it fits the existing worldview and notion of the current situation (van Veen & Ortt 2021). For example, silk produced by modified yeast may seem surprising to the layperson, but it is commonplace to a student of the subject. Similarly, polyamory may surprise some while for others it is a part of life.

Weak signals can help to identify our own assumptions about the present and the future. What if I step outside my own bubble? How would the same signal be interpreted from other perspectives? How would my values and ideals affect my interpreta-

tion? These questions can also help us to understand why others find that something that is familiar to us to be strange or surprising. Curiosity and a desire to understand are keys to interpreting and talking about interpretations.

Interpreting weak signals can be compared to writing a travel guide: trying to describe a place that is distant in your own mind from a familiar place. The guide not only reflects the writer's experiences, but also their worldview. The inhabitants of the distant place described in the guide may be amused or even irritated by it, but it allows for a better understanding of the interpreter's thinking and perspective.

Like travel guides, the use of weak signals has changed over time, which can be seen in the definitions (van Veen & Ortt 2021). Before the 1980s, a weak signal referred to an emerging phenomenon. The use of signals was quite straightforward: they told us about things that we needed to prepare for. Since then, the interdependence of things, unpredictability of impacts and vagueness of signals have become increasingly salient. In postnormal times, the benefit of weak signals is not to forecast of surprises – the future is unpredictable. Instead, weak signals help us to identify and challenge our own and others' assumptions and perceptions of the future – and thereby act in the present to make the future desirable.

Weak signals and megatrends

Megatrends and trends are the currently visible directions of change. They show the evolution of the current system and give an overview of the changes taking place. They provide a good basis for outlining futures and joint discussions, but they are not sufficient on their own. If you only look at megatrends, you can become trapped by the changes underway and blind to surprises.

Weak signals complement trends, not only by bringing more unexpected develop-

ments to the table, but also by guiding us to think differently. Where trends lead us to think in terms of continuities and ask “what next?”, weak signals emphasise discontinuities and encourage us to ask “what if?”. What if non-human species were seen as legal entities? What if everyone received a basic income?

Sometimes, the same thing can be both a trend and a weak signal, depending on how it is interpreted – or more precisely, the same thing can be approached through either trends or weak signals. When seen as a trend, it can be seen as a development within the present system. If, on the other hand, a phenomenon is viewed as a weak signal, it can be seen as a sign of something that challenges the present system.

Take the attitude towards alcohol. If we look at trends, such as the growing popularity of non-alcoholic beers, thinking is directed towards their prevalence as part of the current party culture and bar scene. But if we approach the same subject through weak signals, such as with examples of completely alcohol-free bars, it is easier to identify issues that challenge current practices, even culture. What if not using alcohol was normal in a completely different way from today and using alcohol was the aberration? What if the whole of society was built on not using alcohol?

So weak signals are a tool for imagining other worlds and challenging the existing ones. They help us ask: what if everything were different? This also makes them more difficult than trends. It's easier to imagine minor changes to the present than completely different futures. However, challenging and imagining different futures is particularly important in the postnormal age of surprises, because old ways of doing things and old ideas about the future do not help us to solve today's challenges. It is therefore necessary to rethink society's structures and mindsets in order to move towards a more sustainable future.

Looking at weak signals at best helps

- identify and challenge assumptions about futures, thereby broadening your view of what might happen in the future
- broaden your understanding of different perspectives and their causes
- internalise more surprising developments and reflect on issues in your own life, work, culture or civic life
- identify new opportunities, ways of influencing and budding new developments that we need to amplify – and thus build better futures together.

Fair, sustainable and inspiring future outlook

In this study, we present a number of weak signals and sketches of different futures based on them. The aim is not to provide an exhaustive list of all possible futures – that would be impossible – or even an overview of more unexpected changes. Instead, we want to encourage the reader to identify and interpret the signals themselves, and more broadly envisage surprising different futures.

The weak signals we present and the futures narratives we derive from them also are not predictions. Weak signals can help us identify other possible futures and thereby expand our ideas, but they do not tell us what will happen. Because the aim is to broaden your thinking, some of the issues presented may seem odd and alien. We have tried to bring this oddness to the everyday level, because that is where we will experience the future.

As stated earlier, strangeness and unexpectedness depend on the interpreter and the interpretive framework. The perspective in this study is that of a fair, sustainable and inspiring future, which is also envisaged in Sitra's vision. We have therefore particularly focused our interpretation on what the signals mean for Finnish society and what opportunities or threats they bring. Some of the signals may challenge fairness and sustainability, while others help us under-

stand what a different, more sustainable future would be like.

In collecting and interpreting these signals, we have aimed to challenge our own thinking and assumptions about the future. Nevertheless, the interpretations resemble their authors. It is never possible to completely eliminate subjectivity in collecting and interpreting weak signals, so it is essential to be as open as possible about the choices made and perspectives taken.

In fact, we encourage you to be critical and interpret the following chapters from your own perspective. You should keep an eye on three things in particular:

- 1. Surprisingness.** Why does something seem surprising? Or, if it doesn't seem so, can you find some new features in it?
- 2. Desirability.** What emotions does your reading evoke? Does something seem particularly desirable, and in what way? Or why do some things seem threatening or scary? How can you strengthen desirable things and prepare for threatening ones?
- 3. Your own observations.** What is left out? What surprising things have you found that are not in this study? What could their implications be?

The future is not some abstract, unearthly cluster of developments and surprises taking place in the stratosphere, but something that is happening to us, right here, in the next few moments. What if it is something completely different?

Structure of the study

The following chapters present the signals identified in Sitra's work on weak signals and their interpretation. We have wanted not only to outline the futures the weak signals tell us, but also what it would be like to live in these futures. So the report is structured around different places and situations. For each place, we not only tell the signals and their interpretation, but also short stories about the future.

Each chapter follows a roughly similar structure. The chapters start with what the authors consider to be familiar features and signals of changes and new features of a place. Then the signals associated with managing or reacting to current change are examined. The third section focuses on signals that challenge current developments or indicate a collapse of existing structures. The fourth section considers more significant changes in definitions, practices and culture. The chapter ends with a question for the reader to ponder.

The final chapter describes five steps to get started in detecting, interpreting and talking about weak signals. The appendix to the study describes in more detail how Sitra's work on weak signals has proceeded and which choices and delimitations have been made. The appendix also presents the theoretical background to this work.



ATV



At home

Home is a good place to start looking at weak signals. For many of us, it is perhaps the most familiar place there is. But what are the weak signals associated with home, and what futures do they point to?

HOME

There are numerous assumptions about home that one might not consider until you have to. This can happen in the face of such things as pandemics, relocation or homelessness. The American philosopher Samuel Scheffler describes home as a place that protects us from being lost (Scheffler 2010). He says homes are places where we can go to and return to freely. We experience them as ours, and others recognise them as belonging to us. For Scheffler, the idea of a home is a response to the vastness and impersonality of the universe. Home is familiar to us and our own place in the otherwise alien world.

But what if the technological home feels alien? What will the environmental hand-print of the future home look like? What happens when home becomes the workplace

or when there is no home? What if the home of the future is defined not by technology but by new forms of families, friendship or love?



What if home could be hacked?

■ I wake up to the dawn. All around me I hear the song of thrushes and the swishing of birch leaves. I know that it is still as dark outside as it can be in November, but I have chosen the “cottage” theme from the home functions app to make the autumn mornings a little brighter. I use the app to check for my own REM and deep sleep levels, but also those of my children. My children’s alertness levels are appropriate, so I use the app to allow them to watch cartoons before breakfast. Before I even think about it, the app informs me that coffee is ready.

Images of the home of the future are often technology-centric. In the “smart home”, devices become a seamless part of the whole. The devices work unnoticed, automatically and interconnected. There are many signals in the present that force us to think about an ever more technological and digital home. The evolution of the smart home is not inevitable or without problems, however. What would a future look like where home is pervasively connected?

There is already a huge range of home devices and appliances that can be connected to the web and controlled with a smartphone app, whether it’s a robotic vacuum cleaner, pet food dispenser or pee sensor in a nappy. But more important than individual online devices is the development of devices that can share data and be controlled in aggregate. This kind of development may raise tough questions about privacy and data protection, but also about what we want to know.

The smart home can be intrusive in a different way than now. If we want to know more about ourselves and our health, we can do so by installing sensors and apps. Maybe

in the future, people will want to use sensors in their beds to collect data and get information not only about sleep quality, but also about their sweating, sex life or incipient sleep apnoea. Toilet sensors, on the other hand, can tell us about bowel irritation, prostate health or at least that it’s time to clean the toilet. Perhaps in the future, it will also be polite to turn off at least some of these features when we have friends over for a visit or to stay.

We may well embrace the service that smart homes offer us, regardless of whether it’s health and wellbeing, food or entertainment. It’s also possible that smart homes will have features that bother us or that not everything will work as it should. What if the data collected by smart homes gets leaked online? What if a smart home can be hacked by stealing passwords or breaching the security of doors? Or what if smart homes tell us things about ourselves or our partners that we did not want to know? Maybe in the future, we will not only have to keep our homes tidy but will have to take care of our home’s data hygiene.

What if the household was a circular economy?

■ I remember the time before grey water, before the nutrient cycle, before yeast protein. In my childhood, water, food, waste, energy – everything – went straight through the home. In one direction, like a stone sinking to the bottom of a lake. Now everything that comes into the home is part of a continuous and never-ending cycle. I have drunk this same water dozens, maybe hundreds of times. The same water that the plants, fungi, proteins and mosses in my home drink. Me and *Paecilomyces* fungi, oyster mushrooms and yeasts. Oh, and the goat downstairs.

Current natural resource and energy use and household emissions are unsustainable in many ways, especially in wealthy countries. Many people have therefore imagined other forms of economy and household using renewable energy and recycling materials in closed loops. Closed loop is a circular economy concept that means recovering the excess or side streams from production. The idea is that production and other processes are designed so that there is no waste and all material can be used elsewhere.

Although the principles of the circular economy primarily apply to entire economic systems, they may be applied to households much more in the future. Perhaps we will all have easy ways to use different types of wastewater for different purposes? Of course, even today in Finland, wastewater is treated at a treatment plant and sludge and biogas are recovered from it before being discharged into the sea. Elsewhere in the world – or perhaps in Finland in the future – such centralised waste and water treatment systems are not always realistic options. For example, conflicts, governance failure, natural disasters or new decentralised technologies may mean that in the future water and waste will be treated locally rather than in plants.

What if, in the future, municipalities, governments or businesses were to encourage households to reuse, recycle and reduce waste for financial or other compensation? Perhaps in the future, household by-products could become a means of earning and saving for them, not to mention saving the planet and its natural resources.

What if your home is at risk?

■ ■ *“More than half.... well over half. Depending on the month, 60, maybe 70 per cent,” I answer the benefits coordinator in a video call when she asks how much of my*

earnings go towards rent. “That’s a lot... perhaps you could, or I mean, when did you last put your rent for competitive bidding?” I tell the her that I simply cannot get anything better with my credit rating, that the rental market in my area right now is really difficult. Although of course she knows all about it. “I don’t know how long I’ll cope,” I finally say. The officer’s look on the screen is desolate, blank. I know that the qualifying period for housing benefit still runs way into next year. I don’t know what I was thinking. I don’t know what I’ll do.

In 2019, housing expenses accounted for an average of 19.6 per cent of overall income in Finland (Statistics Finland 2019). But for those on low incomes, the share was considerably higher, close to 40 per cent for the lowest earners. While housing benefits smooth out differences between income groups, the gap between renters and owner-occupiers has grown almost continuously over the last two decades. What if housing costs increase significantly, especially for low and middle-income earners? What if the gap between renters and owner-occupiers housing is closing? What if renting becomes more common and expensive with the centralisation of capital?

Some foretaste of the housing market crisis has been seen during the Covid-19 pandemic in countries such as the US. Many people lost their jobs because of the pandemic and so were unable to pay their rent. In Finland and the US, the proportions of renters and owner-occupiers are similar: in both countries, just over a third of people live in rental housing, just under two-thirds in owner-occupied housing. If there were a future employment crisis in Finland, many people could find themselves struggling to pay their rent or repay their loans. What if a significantly higher proportion of Finns were struggling with homelessness?

Globally, biodiversity loss, climate heating and extreme weather events could lead to more acute migration, more slums or migration from rural to urban areas. On the other hand, phenomena like pandemics, conflicts or violent oppression can drive people from cities to less populated areas. In the 1940s, Finland experienced massive internal displacement, when hundreds of thousands of people left war zones to other parts of the country. How would Finland manage housing and deal with migration if part of the country become uninhabitable because of conflicts or disasters? How would things be organised if more refugees arrived in Finland due to extreme weather or climate-related conflicts?

Even if you don't lose your home, it can fundamentally change in character as the result of an external crisis. During the Covid-19 pandemic, people around the world have had to spend more time at home – working remotely, laid off or unemployed. If the home is small or crowded, or if it is otherwise difficult to adapt to work or a prolonged staying indoors, the walls can figuratively come crashing down. Lack of air conditioning, heating, a garden or windows can make remaining at home extremely stressful in the long term. So not everyone has the same opportunities to work at home or be comfortable there. What if people have to spend more of their time at home in the future because of teleworking, a collapse in air quality, extreme weather, pandemics, environmental disasters or a deteriorating security situation?

What if the home was shared?

■ ■ *"Mommy's home!" my child Echo screams out when I open the front door. I step to the hallway and Echo runs into my arms. It felt like another really long day at work again, and not just for the kids.*

Luckily there is the family to help. There are eight of us: my partners Arne and Khaled, friends Sara and Heather, and then Echo's siblings Pearl and Rodri. One of the adults is always at home with the children. We are usually able to schedule work, evening activities and other partners really well, even though it's often a bit of a hassle. But there's always someone to rely on.

In Finland and other Western countries, the assumption of family composition became established in a specific, quite limited model in which the household comprised one heterosexual couple and their child or children. Historically and globally this kind of nuclear family model is the exception. In Finland and elsewhere, especially earlier, it has been common, especially in the past, for the same household to be shared by several generations, many of whom are related to one another.

Yet, since the rise of the nuclear family model, Finland has also seen a renewed diversification of family models. It should of course be noted that in Finland the heteronormative nuclear family model has always been accompanied by single-person households, single parents, rainbow families, intergenerational families, platonic families, rainbow families and numerous other forms of living and loving together. What if we live in much larger families in the future? What if we share more parenting with friends, relatives and neighbours? What if instead of couples, the majority of romantic relationships were between several people?

For example, we are already seeing changes in parenting that challenge the heteronormative nuclear family model? Couples where friendship and parenting, rather than romance, unite the partners have been written about for a long time. What if parenting was shared with friends? Having a child with a friend or friends does not require a change in the law as such, but if

such forms of parenthood became more common, many would certainly wish to share legal responsibilities and rights with more than one person. What if in the future we could make legal agreements similar to marriage with our friends? What if kinships were based on legal declaration instead of genetic proximity?

Thus, the nuclear family model is being challenged in at least two ways. On the one hand, there are examples of relationships in which shared parenthood is not based on a romantic relationship in the usual sense, but on friendship. On the other, we can see examples of the couple phenomenon unfolding from a romantic relationship between two people to diverse polyamorous or non-monogamous directions.

Food for thought: What if animals had human rights?

One in three Finnish homes has a pet. Pets are often considered part of the family, but they are not seen as having the same basic rights as people. The debate on animal rights focuses on the wellbeing of the ani-

mals, but not on fundamental rights granted to humans, such as self-determination or privacy. As scientific knowledge about animals and the extent of their thinking, consciousness and sociality grows, it is increasingly difficult not to grant most animals agency and moral rights that extend much further than now. Even based on what we currently know, it is difficult to justify the large-scale abuse of animals, making species-appropriate behaviour impossible or killing for reasons that are not unavoidable. What if, instead of the current protection based on animal and environmental protection, animals had robust basic rights to a species-typical, healthy, life worth living?

Read more: Animals Need Digital Privacy Too / Wired 31 January 2020 <https://www.wired.com/story/animals-need-digital-privacy-too/>

SIGNALS

What sort of signals can you recognise concerning your home? Here's a list of the signals underlying this chapter.

MAKING FEEDING PETS SMART

Several devices are available for feeding and monitoring pets remotely.

Source: Pet Feeder Expert 28 May 2020. [Best 5 Smart \(Wifi\) Pet Feeders & Cameras In 2021 Reviews](#).

SMART NAPPY ALERT

Opro9 sells a humidity sensor strapped to a nappy so that you can see on your phone when the nappy needs to be changed.

Source: Opro9 20 August 2020. [Opro9 smart diaper](#).

NIGHT SWEAT MEASUREMENT

Q-Strip is a sensor placed on mattress that measures how much you sweat during the night.

Source: Q-Strip 24 October 2018. [Q-Strip – quantitative measuring of sweating during sleep](#).

SMART TOILET ERA

Smart toilets analyse urine and faeces to monitor your health, and they are predicted to become part of personalised healthcare.

Source: The Guardian / Emine Saner 23 September 2021. [The smart toilet era is here!](#)

A THIRD HAVE DATA SECURITY PROBLEMS

According to a 2020 market survey, a third of US broadband customers had experienced data security problems in the past 12 months.

Source: PR Newswire / Parks Associates 3 November 2020. [Parks Associates: 35% of US Broadband Households Experienced A Data Security Problem in the Past 12 Months](#).

RECYCLING SHOWER WATER IN A TV SERIES

In the TV farce The Politician, a person with a zero-waste lifestyle collects (cold and soap-free) shower water and uses it to make coffee.

Source: Vulture / Allison Shoemaker 20 June 2020 [The Politician Recap: Geronimo](#)

FROM TOILET USE TO VIRTUAL CURRENCY

A South Korean university of technology has a toilet in which the waste is converted locally into methane, used for heating the campus, with microorganisms. By using the toilet, the students earn a virtual currency that can be used to buy goods on campus.

Source: Reuters / Minwoo Park 9 July 2021. [South Korean toilet turns excrement into power and digital currency](#).

BIODIESEL FROM HAM FRYING FAT

In several years already, the Chemical Industry Federation of Finland and Neste and their partners have been running a campaign in which Christmas meal frying fat is collected as raw material for biodiesel.

Source: K-ruoka 26 November 2021. [Kinkkutemppu tulee jälleen](#).

IKEA AS A POWER COMPANY

IKEA is starting to broker solar and wind energy, offering an app for monitoring your electricity consumption and selling surplus electricity produced using IKEA solar panels.

Source: Architectural Digest / Tim Nelson 24 August 2021. [IKEA Is Now Selling a Hot New Product: Renewable Energy](#).

OVERDUE RENTS IN THE US

In summer 2021, up to 11 million Americans were behind on their rent. Source: Fortune / Chris Morris 1 June 2021. [An eviction boom could be less than one month away](#).

EVICTION BOOM IN THE US

The number of evictions was on the rise across the US in autumn 2021.

Source: Forbes / Katharina Buchholz 17 November 2021. [Evictions In The U.S. Rise After Moratorium Ends.](#)

A HOME DESIGNED FOR PANDEMIC TIMES

A US architectural firm designed a home suitable for pandemic times, featuring such things as a

“quarantine room”, a safe place for food and other deliveries, two home offices and places to withdraw to.

Source: Washington Post /Michele Lerner 19 August 2021. [A home of the future, shaped by the coronavirus pandemic.](#)

VISIONS OF THE FAMILY OF THE FUTURE

BBC’s video illustrates possible changes in family life, such as extended families and multi-generational living becoming more common.

Source: BBC 16 May 2020. [What will family life be like in the future?](#)

MINORITIES’ RIGHTS WITH LEGO

Lego published the rainbow flag-coloured “Everyone Is Awesome” set to pay homage to the rights of sexual and gender minorities.

Source: The Guardian / Helen Russell 20 May 2021. [Everyone Is Awesome: Lego to launch first LGBTQ+ set.](#)

CO-PARENTING AS FRIENDS

A column on two friends’ decision to have a child together and other different family arrangements.

Source: Helsingin Sanomat / Heidi Väärämäki 1 August 2013. [Saako lapsen jakaa kavereiden kesken?](#)

BOOK ON POLYAMOROUS RELATIONSHIPS

In her book, Mirja Hämäläinen discusses relationships with more than two parties.

Source: Mirja Hämäläinen 8 October 2020. [Avoimet suhteet.](#)



ATM



At work

The future of work is a permanent topic of foresight. This chapter reviews unexpected work-related developments that can challenge our assumptions of what work will be like in the future. What kinds of stories do we tell about the future of work?

WORK

There is no single future of working life, just like there is no single working life for everyone at the moment. Yet, we often talk about changes in work as if they affect everyone the same way. As you read this chapter, it is worth bearing this diversity of working life in mind and thinking about what the themes raised mean for you.

The future of work is often approached in terms of technology. For example, the focus is on what new technology and its deployment will mean to jobs, tasks and competitiveness. But when you look only at technology, much remains in the dark.

Some of the weak signals collected challenge assumptions about the workplace and workers. What is the workplace – a building where work is done, a laptop on a desk or a place where you meet with your colleagues and can take care of your wellbe-

ing while you work? Or what if there is no work – or workers? What kind of work will be available in the future, and for what sorts of jobs will there be enough people?

The environmental crisis and the subsequent shift to a more sustainable society also prompts the question of what work is worth doing? What would a more environmentally sustainable working life be like? What if we talked about activity and livelihoods instead of work? What exactly is work now and in the future?

What if there is more surveillance?

■ ■ My cheeks ache as I again smile in order to enter the office. I am a bit tired but I try to look focussed

because I know that there are a bunch of surveillance cameras watching me. I walk briskly to fool my smart shoes but I don't think my smart tattoo is so easily duped.

The use of digital services and online platforms has increased in almost all jobs. Massively more data accumulates from work than just a few years ago. This is both an opportunity to better monitor and plan your own work and recovery, but also to more closely monitor employees.

Facial recognition door cameras that only admit smiling employees are a more conspicuous example of what kind of surveillance that can be achieved with existing technology. Facial recognition technology promises to detect the level of concentration of remote workers, and software-generated “productivity scoring” analyses activity with online chats or documents. Systems that monitor alertness and ergonomics can also be installed in, say, delivery vans or warehouses. Employees may not have much of a say in the deployment of such systems.

Wearable smart devices, such as glasses, watches, wristbands or even shoes have also entered the workplace. Smart glasses allow employee to gain important additional information and communicate what they see to a colleague, while a range of measuring instruments can be used for monitoring stress levels and recovery. If you look further into wearables, you can start to think about the opportunities – and threats – that nano-sensors bring. These could be lighter wearables, smart tattoos or implants placed under the skin that collect data about such things as an employee's activity, environment, location and health.

How this data is used depends on the culture of working life and the wider society, such as the perception of employees and level of trust in the workplace. The same data can be used to ensure wellbeing at work and to monitor employees. In some scenarios, the data is linked to benefits, and insurance

premiums, for example, can be higher if you don't exercise enough or haven't been vaccinated. It is high time to debate the rules of data use, both in the workplace and in society in general. On what grounds can an employer collect and use data generated by employees, and can employees refuse this without penalty? Who benefits from data collection, the employer or the employee – or perhaps both?

What if the workplace was an oasis of wellbeing?

■ I am stretching my arms towards the ceiling. What a great lie-down, I think as I step between the green walls. At first, the enforced boredom felt like – well, boring, but in the long run it's been good for me. The pace is slower, lighter, and my mind is clearer. I take part in a few video meetings on the way at a remote work station in the nearby forest. On the one hand, it is safe to talk when “difficult issues” are banned, but at the same time, I am a bit afraid about what issues I'd dare to take a stand on.

Treating an employee like a robot or part of a machine has also provoked a backlash. Lie-down has emerged in opposition of the focus on efficiency and performance. In China, “tang ping”, or “lying flat”, is a passive resistance against what is seen as a consuming life of study and work pushed by the state. In Finland, the focus is on the individual rather than social protest, and “lie-down” and downshifting are suggested as a way to improve wellbeing and stimulate creative thinking. According to some studies, creativity has decreased significantly since the 1990s, blamed on busy lifestyles and the constant stream of entertainment provided by digital devices. People are not bored enough anymore.

Couple this with the long-discussed separation of work from time and place, and the question arises as to the role of the physical workplace, especially in knowledge work. Why go to the office? What kind of workplace would support both physical and mental wellbeing? In the US, during the Covid-19 pandemic, some hospitals built relaxation rooms for staff that mimic nature through lighting, sound and smells. Also on sale is a meditation pod that looks like a giant seed and offers both aromatherapy and meditation guided by sound waves and LED lights. On the other hand, why shut yourself up in a pod mimicking nature when you can move your workstation to the woods? As multi-local work becomes more common, more meeting and working points may also appear in the urban landscape and shopping centres.

There are also signs that there is desire to curb workplace discussions in the workplace in the name of wellbeing and good working culture. In the US, some companies have completely banned political discussions between employees, because they are seen as distractions and a waste of energy. A similar decoupling of work from personal life is represented by the scrapping of sports vouchers and the like, and the payment of benefits in cash so that the workplace does not have too much control over the employee's leisure time. In Finland, conversely, there has been debate about what employers are allowed to say – for example, can they urge employees not to get vaccinated? Where is the balance between freedom of speech and occupational health and safety?

What if there are no employees?

■ *Another all-nighter. Another staff shortage at the day care centre, which means that in addition to my five-year-old, I also have to look after the neighbour's kids. You see,*

she can't stay home and, unlike me, has no flexible working hours. I suspect, though, that soon she will also resign from her job as a mid-wife – so many of her co-workers have already changed jobs. If only you could be appreciated right down to the bottom line and given the chance to do your job well. That's what everyone wants.

The Covid-19 pandemic has had impacts on working life and shaken many industries. There is already talk about a massive wave of redundancies across the world of people who are dissatisfied with their jobs looking for other work. In Finland, teachers and health-care professionals, already under increasing pressure earlier, have found the situation even more acute and many have considered career changes. The rush and poor working conditions are already threatening patient safety.

But not all sectors can find more skilled workers to recruit. In some cities, early childhood education is understaffed and parents have been asked to look after their children at home. When a parent stays at home to care for their child, it also has implications for other sectors. There is also a labour shortage in technology industries as well, for example, with women not seeking education in the field or changing jobs due to stereotypes or discrimination.

Cautionary examples of the impact of labour shortages can be seen in the UK, where Brexit and the pandemic have left many workers in short supply. Labour shortages in early childhood education, training, and healthcare will have long-term consequences for both skills and wellbeing. Of course, the situation is the worst for the employees in the sector. What if working conditions and compensation for work were significantly improved? What if investments in training, social security, equality, health care and healthy and safe working conditions were seen as a return on investment?

What if the meaning of work changes?

/// I smile when Antti Tuisku sings in the lines of "I gotta twerk to get bread" on a radio nostalgia programme. Nowadays you don't have to work for money, you're motivated by totally other things. Or work in the old sense is not talked about anymore. Now we work together to solve problems and build that much talked about better future. Thanks to basic income, it is not necessary to worry about making a living, but we do have to worry about the planet.

The emphasis on the meaningfulness of work has been much talked about for some time. Meaningful work is characterised by dignity, a productive goal and self-fulfilment (Martela and Pessi 2008). This makes work feel worth doing, both for yourself and society – the feeling that you are doing something important. But are there signals of such a change in the role of work?

Ecological reconstruction will change work significantly, and the meaningfulness of work will also increase. In a fair and sustainable society, it should not be profitable to engage in work that is harmful to the environment and to people. Work would then be seen as a way of building a better society for everyone, including future generations. What if job vacancies were considered not only in terms of position and pay, but

also in terms of the environmental benefits of the job? Or what if governments established environmental corps to help to mitigate and adapt to the environmental crisis?

You don't do meaningful work just for the money, but you should get an income from somewhere. For sometime now, a basic income, a free sum of money for all, has been proposed as a means of securing a living wage. This was also tried out in Finland, and in some places a model similar to basic income is already in use. Basic income is also available in cryptocurrency. What if basic income guaranteeing a livelihood were offered throughout Finland – or globally?

Food for thought: What if our perception of time changes?

One assumption concerning the future of work – and indeed of life – is about time. We easily talk about working hours and schedule meetings to the minute. Some people even dare to suggest shortening working hours. But what if we challenged our notion of time more fundamentally? What if our concept of time was not based on precisely measured time, but, say, sunrise and sunset or nature's cycles? Or what if we measured time as interconnected events? What would life be like then?

[Read more: Noema / Joe Zadeh 3. June 2021: The Tyranny Of Time](#)

SIGNALS

What sort of signals can you recognise related to work? Here's a list of the signals underlying this chapter.

GOING TO WORK WITH A SMILE

Canon installed door cameras that only let smiling employees in to its offices in China.

Source: The Verge / James Vincent 17 June 2021. [Canon put AI cameras in its Chinese offices that only let smiling workers inside](#)

ARTIFICIAL INTELLIGENCE MONITORS CONCENTRATION

Face recognition technology developed by Fujitsu promises to detect the level of concentration of remote workers.

Source: Tekniikka & Talous / Samuli Käsälä 11 March 2021. [Fujitsu kehitti tekoälyn valvomaan etätyöläisten keskittymistä ilmeiden perusteella](#)

SUPERVISOR MONITORS YOUR PRODUCTIVITY SCORES

Supervisors were able to monitor the activity of individual employees using the "productivity score" in Microsoft 365, monitoring things like participation in group discussions or number of comments in shared documents.

Source: The Guardian / Alex Hern 2 December 2020. [Microsoft apologises for feature criticised as workplace surveillance](#)

CAMERAS MONITORING DELIVERY DRIVERS

Amazon has installed a surveillance camera system in its delivery vans, aiming to improve safety by monitoring the alertness of drivers.

Source: Vice / Lauren Kaori Gurley 23 March 2021. [Amazon Delivery Drivers Forced to Sign 'Biometric Consent' Form or Lose Job](#)

ALGORITHM SAFEGUARDING ERGONOMICS AT WORK

Amazon aims to reduce injuries caused by repetitive movements in its warehouses by allocating working duties with an algorithm that will spread movements across muscle-tendon groups.

Source: The Next Web / Thomas Macaulay 16 April 2021. [Amazon's new algorithm will spread workers' duties across their muscle-tendon groups](#)

CHALLENGES OF SMART DEVICES IN THE WORKPLACE

Kateryna Maltseva's article discusses the use, possibilities and ethics of smart devices used at the workplace.

Source: Business Horizons 63(4) 2020 / Kateryna Maltseva. [Wearables in the workplace: The brave new world of employee engagement](#)

NANOSENSORS FOR WORKER SURVEILLANCE

Gary Marchant's article discusses the ethical issues relating to nanosensors used for worker surveillance.

Source: AMA Journal of Ethics 04/2019 / Gary E. Marchant. [What Are Best Practices for Ethical Use of Nanosensors for Worker Surveillance?](#)

HIGHER INSURANCE PREMIUMS FOR THE UNVACCINATED

Delta Airlines will increase the health insurance premiums of its unvaccinated employees and restrict the number of sick leave days available to them.

Source: CNN / Pete Muntean & Chris Isidore 25 August 2021. [Delta will hike insurance premiums and limit sick pay for unvaccinated employees.](#)

TANG PING, OR LYING FLAT IN PROTEST

In protest against the rat race and unrealistic career ambitions, the growing tang ping movement in China, which the government is trying to censor, emphasises a simpler life.

Source: CNN Business / Sophie Jeong 29 August 2021. [Exhausted and without hope, East Asian youth are 'lying flat'.](#)

WELLBEING FROM A LIE-DOWN

Lie-down, or sufficient rest, stopping and avoiding over-exertion is presented as part of a more sustainable life and wellbeing.

Source: Kaustisen seutu / Tytti Pohjola 22 December 2020. [Näin pötkötteleet - ajatuksia paremmin voimiseen 2020-luvulla.](#)

CREATIVITY SUFFERS FROM A LACK OF BOREDOM

Creativity tests show that people's creativity has been on a decline for two decades, and the suspected culprit is too hectic a life and information overload.

Source: Inc. / Jessica Stillman 6 July 2021. [Research Suggests We're All Getting Less Creative and Scientists Think They Know Why.](#)

RECHARGE ROOMS FOR CARE STAFF

During the Covid-19 pandemic, US hospitals have built separate recharge rooms for healthcare workers with relaxing lighting and nature sounds.

Source: Mount Sinai, 2021. [Recharge rooms.](#)

MEDITATION POD

OpenSeed sells companies a pod for relaxation, guiding the user to a meditation break and offering therapeutic sounds and LED lights.

Source: TechVersions / R. Smriti 11 September 2020. [Here's What OpenSeed's \\$25,000 Meditation Pod Offers.](#)

REMOTE WORKSTATION IN THE WOODS

Lahti has established a number of remote workstations in parks and woods, with places for laptops and unbeatable views.

Source: Green Lahti, 2021. [This Nordic city takes remote work to the woods: now you can work in the middle of the forest.](#)

MEETING POD FOR PLAZAS AND PARKS

A British design office developed a solar-powered meeting booth powered by solar panels that can be placed in city plazas and parks as remote workstations and meeting places.

Source: Yanko Design / Shawn McNulty-Kowal 22 July 2021. [These eco-friendly meeting pods deliver solar-powered charging ports so you bring WFH outdoors!](#)

NO SOCIAL DEBATE AT WORK, PLEASE

In the US, in spring 2021 the software company Basecamp completely banned political discussion among employees, which was seen as a distraction and waste of energy. Similar decisions have also been taken in other Silicon Valley companies, and they have also attracted opposition.

Source: Yle / Teemu Hallamaa 1 May 2021. [Useat teknologiayhtiöt ovat kieltäneet politiikasta keskustelun työpaikalla – Suomessa aihe ei ole noussut esille.](#)

NOTICE FROM AN ANTI-VAXXER CEO

Juha Kärkkäinen, CEO of the department store chain Kärkkäinen, urged his employees not to be vaccinated against the coronavirus. Even though the notice was against the spirit of occupational health and safety, it was justified in the name of freedom of speech.

Source: Yle / Iida Putkonen & Hanna Holopainen 19 August 2021. [Tavarataloketjun johtaja kehotti työntekijöitä kieltäytymään koronarokotteesta – laki sallii rokotevastaisen viestin jakamisen, ammattiliitto moittii.](#)

RESIGNATION BOOM IN THE US

A record number of people have quit their jobs in the US, and there are more strikes than usual. This is due to deep dissatisfaction with the current working life and the opportunity for change provided by the benefits paid during the Covid-19 pandemic.

Source: Yle / Iida Tikka 20 October 2021. [Ennätyksellisen moni irtisanoutuu ja lakkoja sikiää kaikkialla: Tästä on kyse Yhdysvaltojen työmarkkinoita myllertävissä trendeissä.](#)

MORE THAN HALF OF TEACHERS HAVE CONSIDERED A CAREER CHANGE

According to a Trade Union of Education in Finland survey, more than one in two teachers have considered a career change. This is due to the increased workload, and dissatisfaction with pay levels in the wake of Covid-19.

Source: Helsingin Sanomat / Marjukka Liiten 28 September 2021. [Kysely: Yli puolet opettajista harkinnut alanvaihtoa – OAJ:n puheenjohtaja puhuu jo hätätilasta.](#)

ALMOST ALL NURSES HAVE CONSIDERED CHANGING CAREER

According to a Tehy (Union of Health and Social Care Professionals in Finland) survey, the majority of nurses and almost all nurses aged under 30 have considered changing career due to intolerable pay and working conditions.

Source: Yle / Marja Sannikka & Petra Nykänen 10 September 2021. [Kyselyn mukaan lähes kaikki alle kolmekymppiset hoitajat harkinneet alanvaihtoa – Tehyn puheenjohtaja: "Potilasturvallisuus on vaarantunut munasolusta mummoon"](#).

MIDWIVES' COMPLAINT AGAINST EMPLOYER IMPROVED WORKING CONDITIONS

Midwives in Oulu complained about their employer to the Regional State Administrative Agency supervising the hospital about the lack staff and constant rush. The situation has improved after two years of supervision, with the hospital hiring more midwives and providing further training.

Source: Yle / Kirsi Karppinen 7 October 2021. [Kättilöt kyseenalaistivat äitejä ja vauvoja hoitavan osaston turvallisuuden – alkoi liki kahden vuoden syyni, joka osoittautui tarpeelliseksi](#).

SHORTAGE OF EARLY CHILDHOOD EDUCATION TEACHERS

Oulu and Helsinki suffer from a shortage of early childhood education teachers, and parents have been requested to care for their children at home on some days if possible.

Source: Yle / Iida Putkonen & Hanna Holopainen 21 October 2021. [Lapset jäävät päiväksi kotiin, perheille maksetaan takaisin luvatusa hoitopaikasta – Oulussa varhaiskasvatus on kriisiytymispisteessä](#).

HARASSMENT AND DISCRIMINATION WORSEN SHORTAGE OF SPECIALISTS

There is a skills shortage in the technology sectors suffer, worsened by women not joining the field or leaving it on account of poor working conditions, harassment and discrimination.

Source: Helsingin Sanomat / Joakim Westrén-Doll 22 September 2021. ["Naisten aivovuoto" pahentaa teknisten alojen osaajapulaa Suomessa – Työyhteisöjen syrjivät toimintatavat saavat naiset vaihtamaan työpaikkaa](#).

LABOUR SHORTAGE IN THE UK

With the pandemic and Brexit, the UK is suffering from workers in various fields, and because there are not enough tanker drivers, for example, the military has had to help with the distribution of fuel.

Source: The New York Times / 17 June 2021. [After Pandemic and Brexit, U.K. Begins to See Gaps Left by European Workers](#).

SCOREBOARD FOR GREEN JOBS

The British innovation fund Nesta has developed a methodology to identify and classify the "greenness" of job vacancies and so monitor the transition to a more sustainable society through jobs.

Source: Nesta / India Kerle & Cath Sleeman 20 September 2021. [Finding jobs in green industries: methodology](#).

CLIMATE CORPS IN THE US

In the US, the government plans to establish a corps for directly mitigating and adapting to climate change as part of its extensive climate package. The Civilian Climate Corps would, for instance, restore wetlands and combat invasive species.

Source: NPR / Nathan Rott & Scott Detrow 11 May 2021. [Reaching Back To The New Deal, Biden Proposes A Civilian Climate Corps](#).

CROWDFUNDED BASIC INCOME

In Germany, the non-profit association Meingrundeinkommen raises money with crowdfunding and distributes it in a raffle. Participants in the draw can win a basic monthly income of EUR 1,000 for a year.

Source: Reasons to be Cheerful / Marjolein Koster & Ties Gijzel 10 August 2021. [The Surprising Lives of Germany's 'Basic Income' Raffle Winners](#).

BASIC INCOME IN CRYPTOCURRENCY

GoodDollar offers anyone who agrees to provide their personal data a basic income in its own cryptocurrency. WorldCoin collects somewhat more personal data, requiring an iris scan to receive basic income – also in the platform's own cryptocurrency.

Sources: Forbes / Lawrence Wintermeyer 10 September 2020. [eToro Launches GoodDollar And Begins Delivering Universal Basic Income](#). and Wired / Gian M. Volpicelli 21 October 2021. [You Can Get This Free Crypto—If the 'Orb' Scans Your Eye](#).



INNA



In nature

We are dependant on nature, but nature is not dependant on us. What signals are there about what it will be like to walk in nature in the future? What will our relationship with nature look like?

NATURE

The biggest surprise about the environment is that we have not yet realised the situation we are already in now. The climate crisis, extreme weather events and biodiversity loss are not the future but the present. We have shaped our environment to a state that it has never been in before. The familiar and steady times are gone, the postnormal times of surprises are upon us.

There is, of course, growing awareness of the change that has already taken place has, and a lot is already being done to mitigate the climate crisis and biodiversity loss, but not enough. What if we act quickly on ecological reconstruction, such as by stopping the use of fossil fuels and overuse of resources?

Merely reducing climate emissions and other harm is not enough. We also need to fix the damage already done by storing carbon dioxide from the atmosphere and increasing biodiversity. What might this look like and what is already being done about it? Or, what if we have not acted fast enough and have already past many environmental tipping points, having caused self-reinforcing, irreversible change? And what if the world becomes partially uninhabitable? Will that tempt us to transform life itself, develop new species and also alter ourselves?

What will nature look like or what will nature mean in general in the future?



What if nature is treated as a national treasure?

■ ■ *My investment is growing well. The key to success is diversification. In the same area there are now trees, crops, mushrooms and deadwood hotels for insects, and of course a wind power plant as the cherry on top. I'm going to rest on the bench for a moment and admire my estate. I'd rather follow this than the stock market.*

People are dependant on nature. It provides us with food, clean air and water, raw materials and a place to refresh and relax. But biodiversity and with it its ability to offer these services is dwindling faster than at any time in human history. Signals of pollution and unsustainable use of nature have not been weak for some time. But what are the signals for improving the state of nature?

The Dasgupta report, published in spring 2021, calls for better management of nature capital and proposes a price tag for nature's services (Dasgupta 2021). Currently, the economy is assumed to operate in isolation from nature, despite the huge economic impact of the degradation of nature's services. According to the IPBES report, the disappearance of pollination by butterflies, bumblebees and other insects can cause annual losses of up to USD 577 billion in global agriculture (IPBES 2019).

There are numerous ways to improve the state of the environment. Many solutions require that we challenge old definitions. Agroforestry, for example, is about growing trees alongside crop and livestock management to produce food, fibre, energy, fodder, timber and medicines simultaneously in the same area.

What if nature capital were treated like any other capital, and its preservation prioritised in economic considerations? How would we take into account not only the material benefits but also the immaterial

benefits, such as nutrient cycles and biodiversity? A related issue is the ownership of nature: a forest owner owns the wood fibre growing on a landholding, but who owns the immaterial benefits provided by the forest? Or should nature even own itself?

Natural capital can also be seen as important for national identity and competitiveness. Finland is already marketed as a country of clean air and water. What if we insured our natural capital and did our best to preserve it? What if nature were treated as a national treasure?

What if we rewild the land we have worked?

■ ■ *I might see a willow tit today, I think as I try to scramble through the woods with ease. Behind me, a meadow lined by apartment blocks, where I had to watch out not to tread in the wisent poop. I am headed for a once-drained marsh that was recently added to this habitat – I need to check how the water level has begun to rise. I stop to catch my breath and listen to the sounds of the forest. Was that a Siberian jay?*

Mitigating the climate crisis requires increasing carbon sinks and carbon capture. We are working hard to find ways to do the latter, and to find out what to do with the carbon dioxide we capture. For example, there are plans to erect 1,200 columns in the desert, that will capture carbon dioxide a thousand times more effectively than trees. Or haul olivine rocks to the seashore, which will not only capture carbon dioxide through wave erosion but also prevent ocean acidification. Both ideas are still in the planning and testing phase. Climate emissions must therefore be driven quickly and efficiently towards zero while these and similar solutions are developed.

In addition to the climate crisis, we must solve biodiversity loss. We must halt the degradation of nature and increase biodiversity while taking climate action. So planting single-species forests to sequester carbon is not a viable solution. Instead, restoring degraded habitats is beneficial for both the climate and biodiversity, and thus also for Finland's security of supply, raw material security, self-sufficiency and public health. For example, Finland has a wealth of peatlands to restore. Rewilding is a distinctive approach to restoration and environmental protection. It supports nature's own processes, for example by removing dams and returning lost species, with the aim of restoring an area to its natural state.

Natural ecosystems are complex and therefore, for instance, bringing new species to an area requires careful consideration and knowledge. History is full of cautionary examples of it. In practical conservation work, there is experience of transplanting species to strengthen endangered populations or increase diversity. Far more questionable is the use of genetic engineering to restore a long-extinct species, such as the mammoth. What will nature conservation be like in the future, and what will be its impact on nature? What if everyone learned to observe the balance of natural environments?

What if we have gone past the tipping point?

■ ■ I hum Maija Vilkkumaa's song *Lissu*:
"I watched the seasons, they were stranger than before". With hindsight, I can say that this is quite an understatement. I stop humming to cough and clear my throat. It's hoarse all the time from the smoke of forest fires. But maybe it'll soon rain again and flood the place. Imagine that houses once had basements!

Humanity has already irreversibly changed the environment. According to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, ocean levels will rise, seas will become acidic and glaciers will shrink (IPCC 2021). The more the climate warms, the more likely it is that we will cross tipping points, after which change is irreversible. A tipping point is not an exact number or single thing, but a measure of the interdependence of the environment. Crossing one tipping point takes us closer to others. For example, the melting of glaciers and sea ice affects Atlantic Ocean currents, which in turn affects to, say, the frequency of dry spells in the Amazon rainforest area (Lenton et al. 2019). While irreversible change has already happened, every tenth of a degree in limiting climate heating is a valuable gain.

There are abundant signals of tipping points being exceeded. The North Pole is melting and there is likely to be no more ice on the Arctic Ocean by the 2030s. The Gulf Stream and the entire North Atlantic Current system has been slowing for several years. The Amazon rainforest is at risk of becoming largely savannah in the next 15 years, no longer a major carbon sink but a source of emissions. According to the most recent studies, the Amazon has already become an accelerator of climate warming instead of a mitigator.

What if we have already passed several tipping points and set in motion an irreversible environmental transformation? Then, the gloomiest scenarios of the climate reports lie ahead: significant sea-level rise, floods, droughts, storms, extreme weather events and accelerating biodiversity loss. Food production will collapse and many people will have to move away from areas submerged or rendered uninhabitable by heat. What if we live in an increasingly small area in the future? And even there, bracing ourselves for continued extreme weather conditions?

A changing environment brings not only extreme weather but also other hazards for humanity. Diseases such as malaria can

spread to larger areas and biodiversity loss will increase the risk of pandemics caused by viral diseases. A warmer climate also increases algal blooms that are toxic to humans, and their toxins can also spread into the air as water evaporates. So what would it be like to live in such a world? Can we learn something about it while doing everything we can to avoid ending up in it?

What if life becomes modifiable?

The adapted adapt aptly, says a sticker on the side of the growing container. I laugh at the clumsy slogan and know that it's now stuck in my head. I am picking up a new load of cleaners – microbes that eat harmful substances – for a soil restoration project. Personally, I would invest even a lot more in restoring environment than into modifying organisms to survive in a changed environment. But I guess both are needed. As long as they don't modify me.

Throughout history, humans have modified plants and animals to suit their own needs. Advances in synthetic biology in recent years have made it possible to modify organisms at the genetic level in a completely new way. Crops have already been created that survive difficult conditions or can prevent pests, making pesticides unnecessary. There are also microbes being developed that regenerate contaminated soil by eating hazardous chemicals, and engineered mosquitoes to prevent malaria. Oil-eating bacteria have already been found in the oceans.

Because natural ecosystems are very complicated and interdependent, releasing modified organisms to them is a big risk. The consequences are partly unpredictable – modified organisms can displace existing species. On the other hand, the proliferation

of species modified to better withstand pesticides may increase the use of pesticides and thereby reduce the survival of naturally occurring species. In closed processes, however, modified organisms are already used. Yeast, for example, has been modified to produce fuel, medicines or aromas. What if in the future all raw materials we need are produced in large vats?

Besides modifying existing organisms, we can start almost from scratch. Scientists have enhanced the synthetic cell they created a few years ago so that it can now grow and replicate like a normal cell. This not only increases our understanding of how cells work, but also opens the door to designing completely new kinds of organisms.

The use of new gene technologies is not limited to plants and microbes. Research is also being carried out on human stem cells, and the modification of human DNA has been proposed to prevent future pandemics. What if in the future, humans are also modified alongside other organisms? What if humans modify themselves to adapt to the changed environment, such as extreme heat and drought?

Food for thought: What if more than half the planet was protected?

The 1992 Convention on Biological Diversity set a target of 17 per cent of the Earth's land area to be protected by 2020. This goal has not been reached in most countries, but it has been raised nevertheless. Scientists are now proposing that one half of all land should be protected to prevent biodiversity loss and the climate crisis. What if this could be achieved? What would nature look like? What if humanity restricted its activities to an ever smaller area?

Read more: [National Geographic / Stephen Leahy 19.4.2019: Half of all land must be kept in a natural state to protect Earth](#)

SIGNALS

What sort of signals can you recognise related to nature? Here's a list of the signals underlying this chapter.

OVER 1000 SOLUTIONS TO THE ENVIRONMENTAL CRISIS

The Solar Impulse Foundation has listed more than one thousand profitable innovations to solve the climate crisis and generally improve the state of the environment.

Source: Solar Impulse Foundation (2021). [1000+ profitable solutions to protect the environment.](#)

100 SOLUTIONS IN 100 DAYS

Global Footprint Network listed 100 solutions to overconsumption in 2021 – one per day between the Earth Overshoot Day 2021 and COP 26.

Source: Earth Overshoot Day (2021). [100 Days of Possibility.](#)

AGROFORESTRY

Agroforestry was discussed at a seminar in Qvidja in September 2019.

Source: Baltic Sea Action Group (2019). [Agrometsätalouden perusteita – mitä on peltometsäviljely? 28 June 2019.](#)

INSURED CORAL REEF

A coral reef in Mexico is being insured, and after a hurricane struck in 2020, the insurance covered the cost of its restoration.

Source: Reasons to be Cheerful / Oliver Gordon 20 July 2021. [This Is the First Ecosystem With Its Own Insurance Policy.](#)

RIVER A LEGAL PERSON

In New Zealand, a river and the woods surrounding it have been granted the status of a legal person.

Source: National Geographic / Kennedy Warne 16 August 2021. [New Zealand's Whanganui River is a legal person. How will it use its voice?](#)

FINLAND IS THE CLEANEST AND GREENEST COUNTRY

Finland is marketed for its clean nature, and the Environmental Performance Index says that Finland is the world's cleanest and greenest country.

Source: Slow Finland / Ari Turunen. [Finland is the world's cleanest and greenest country.](#)

ARTIFICIAL FOREST FOR CO₂ CAPTURE

Arizona State University has developed artificial trees – carbon-absorbing columns – that suck up carbon dioxide a thousand times more effectively than real trees.

Source: Reasons to be Cheerful / Michaela Haas 24 September 2021. [Can We Suck Up Enough CO₂ to Cool the Planet?](#)

OLIVINE MINERAL TO SHORES TO SEQUESTER CARBON

Project Vesta is testing how olivine mineral brought to seashores can sequester carbon with erosion caused by waves and prevent ocean acidification.

Source: Project Vesta. [Harnessing the power of the oceans to remove excess CO₂ from the atmosphere.](#)

CARBON SEQUESTRATION BY RESTORING PEATLANDS

Hiilipörssi uses donations to restore drained peatlands, which when restored will sequester carbon and increase biodiversity.

Source: Hiilipörssi. [Sijoita päästösi suohon.](#)

REWILDING ASSOCIATION

The Finnish Rewilding Association aims to develop nature protection by moving on from conserving what exists to restoring lost ecosystems.

Source: Suomen Luonnon Villiinnytys ry. [Villin luonnon puolesta.](#)

USING WOOD-DECAY FUNGI TO INCREASE BIODIVERSITY

UPM, Natural Resources Institute Finland and the University of Helsinki are researching transplantation of decomposer fungi into UPM's forests with the aim of increasing forest biodiversity.

Source: UPM / Matti Maajärvi 5 March 2019. [Lahottajasienten siirtoistutus – uusi tapa monimuotoisuuden lisäämiseen.](#)

MAMMOTHS TO THE TUNDRA

A genetic engineering company's plan to create mammoth-elephant hybrids and allow them to roam the tundra has received a mixed reception.

Source: Yle / Yrjö Kokkonen 14 September 2021. [Geeniteknologiyritys yrittää luoda laumoittain mammutin ja norsun risteymiä vaeltamaan tundralle.](#)

RELEASING MILLIONS OF BEES IN THE WILD

The retail chain Marks and Spencer's plan to release 30 million honeybees to the nature was rejected because it was seen as a threat to other bee populations.

Source: The Guardian / Phoebe Weston 16 April 2021. [M&S faces backlash over plan to release 30m honeybees.](#)

ICE-FREE ARCTIC OCEAN

The ice cover is diminishing around the North Pole, and it is estimated that the Arctic Ocean ice-free by the 2030s.

Source: Yle / Anne Borgström, Olli-Pekka Lukka & Jyrki Lyytikä 7 February 2021. [Pohjoinen napajää sulaa.](#)

GULF STREAM SLOWING DOWN

The North Atlantic Current system is becoming unstable, which may result in a significant slowdown of the Gulf Stream.

Source: The Guardian / Damian Carrington 5 August 2021. [Climate crisis: Scientists spot warning signs of Gulf Stream collapse.](#)

AMAZON RAINFOREST TURNING INTO SAVANNAH

Logging and increased forest fires and droughts caused by the climate crisis threaten to turn most of the Amazon rainforest into savannah over the next 15 years.

Source: World Economic Forum / Oliver Cann 22 January 2020. [Fifteen Years to Save the Amazon Rainforest from Becoming Savannah.](#)

AMAZON RAINFOREST CHANGED FROM CARBON SINK INTO A SOURCE OF EMISSIONS

The degraded state of the Amazon rainforest has meant that it is probably emitting more emissions than it sequesters.

Source: National Geographic / Craig Welch 11 March 2021. First study of all Amazon greenhouse gases suggests the damaged forest is now worsening climate change.

MALARIA ENTERS EUROPE

As a result of climate change, malaria-carrying mosquitoes have spread to new areas and might also spread to parts of Europe.

Source: Financial Times / Oliver Barnes 27 September 2021. [Climate change threatens to reverse progress in fight against malaria.](#)

BLUE-GREEN ALGAE IN THE AIR

For the first time, scientists have observed blue-green algae toxins in the air near a pond with an extensive blue-green algal bloom.

Source: United Press International / Brooks Hays 2 April 2021. [Blue-green algae blooms can release harmful toxins into the air.](#)

INCREASING TOXIC ALGAL BLOOMS

Scientists warn that we may be creating the same conditions that contributed to the Permian mass extinction. At that time, toxic algal blooms became more common due to increased greenhouse gas emissions, high temperatures and high nutrient levels.

Source: MTV Uutiset / Jari Heikkilä 18 September 2021. [Tutkijat varoittavat ihmiskunnan seuraavan joukkotuhon reseptiä: "252 miljoonaa vuotta sitten elämä kuoli myrkylliseen keittoon".](#)

ENVIRONMENTAL IMPACTS OF SYNTHETIC BIOLOGY

The use of synthetic biology offers numerous opportunities for improving the state of nature, but also poses significant risks.

Source: European Environment Agency / Vincent Viaud 28 October 2020. [Synthetic biology and the environment.](#)

OIL-EATING BACTERIA

A large number of oil-eating bacteria have been found in the Faroe-Shetland Channel, and their use in the clean-up of oil spills is being investigated.

Source: Phys.org / Sarah McDaid 30 March 2021. [Oil-eating bacteria could help to tackle spills.](#)

ARTIFICIAL CELL CAPABLE OF DIVIDING

Scientists have created a single-cell synthetic organism that can grow and divide normally.

Source: National Institute of Standards and Technology 29 March 2021. [Scientists Create Simple Synthetic Cell That Grows and Divides Normally.](#)

EYE IN MINI-BRAINS GROWN FROM STEM CELLS

Scientists have created brain-like clusters of cells and have created an eye-like light-sensitive organ in them.

Source: ScienceAlert US LLC / Michelle Starr 17 August 2021. [Scientists Grew Stem Cell 'Mini Brains'. Then, The Brains Sort-of Developed Eyes.](#)

HUMAN-MONKEY HYBRID

Scientists have been studying the insertion of human stem cells into a monkey embryo, prompting calls to ban human-animal hybrids.

Source: The Washington Times / Ryan Lovelace 2 June 2021. [Man-monkey hybrid sparks fears of 'Frankenstein' creatures.](#)

GENETICALLY MODIFIED TWINS HAVE BETTER LEARNING ABILITY

The first genetically modified twin girls were born in 2018. Their genes had been modified to be immune to HIV. It seems that the modification has also affected their brains, possibly improving their ability to learn.

Source: MIT Technology Review / Antonio Regalado 21 February 2019. [China's CRISPR twins might have had their brains inadvertently enhanced.](#)

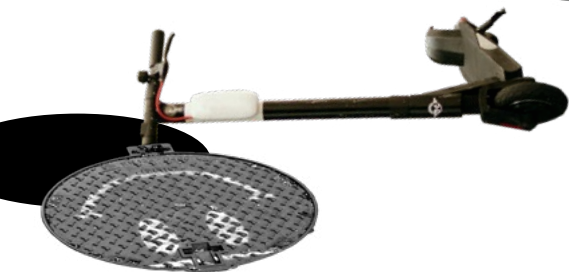
GENETIC EDITING TO PROTECT US FROM A PANDEMIC

The Covid-19 pandemic has reignited debate on genetic modification of humans to make them more resistant to new viruses.

Source: The Conversation Trust (UK) Limited / Yusef Paolo Rabiah 7 December 2020. [Editing the DNA of human embryos could protect us from future pandemics.](#)



IN THE



In the city

In the city, we shop, work and hang out – and, of course, live. How will the cityscape and our time there be shaped? What will it be like to be in the city in the future?

THE CITY



It is easy to contrast the city with the countryside, even though they are intertwined. Urbanisation has long been discussed, both globally and in Finland. Cities are home to an increasing proportion of the population, but they are naturally also a lot more than a place to live in – people come to work, shop, enjoy culture and party. What will it be like to be in the city in the future?

Our current consumption patterns are environmentally unsustainable. Is it possible to find a future narrative in which our consumption can fit on one planet? Or, what if we are something else instead of consumers? What will it be like to go shopping in the future, what signals can we find, for example, in the way we shop?

As a result of the environmental crisis, cities are also changing. We need to be better

prepared for extreme weather events, such as heatwaves and storms. Giving up fossil fuels, on the other hand, will impact transport. What are the signals that our urban landscape or the way we travel is changing?

Migration has been moving towards urban areas for a long time. The Covid-19 period has challenged this trend, especially in the Helsinki region, but has not reversed it. What are the signals for moving out of cities to the rest of Finland? What kinds of things could lead to this?

Or how about when it is time for leisure, what will it be like to go to a restaurant or bar in the future? What will be on the menu and what will the party culture be like? What if our current eating habits and use of intoxicants are viewed with incredulity in the future?

What if consuming turns to doing?

/// Loud talk and camera lights snap me out of my thoughts. Yep, once again someone's making a spectacle of their shopping trip. Not wanting to end up in their social media stream, I slip past the material bins towards the repair workshop on the shopping plaza. Soon a lesson and workshop on repairing shoes will begin. My sneakers grimace for perhaps the last time.

Freelancers are sometimes offered visibility as payment but it is not legal tender in shops. Except at Pick Me Up in Toronto, where you can pay by posting on social media and tagging the shop. Product placement and commercial co-operation have become familiar to us from TV shows, blogs, social media updates and YouTubers' videos. What if shopping was primarily a show for others?

Buying new things and the consumption culture are being challenged by repair cafes and, more broadly, circular economy business models. Instead of a disposable culture, many want easy ways to repair broken appliances and clothes. Many initiatives and communities have sprung up around artisanship and repair. What if in the future we stopped buying things and started repairing and modifying what we already have?

Or what if repairing was combined with local production and materials that use waste? For example, artificial leather can be made from apple peel or mushrooms, and textiles can be made even from cow dung. What would a shop be like, where you went to meet people and repair things using all the waste as raw material? So, what might the shopping trip of the future be like – or would we even use that word anymore?

What if trees were planted on the streets?

/// I huff and puff as the electric motor hums. Despite the extra assistance, taking two children on a bike in this heat is real exercise. I forgot the children's sun suits and now they're now banging on the already breaking UV screen that's rattling in the wind. Fortunately, we'll soon be slipping into the shade and coolness of the trees. The children are pointing at the houses twinkling between trees. The sun is blazing, but it's cooler here in the shade of trees, and the breeze from speed feels refreshing. Nevertheless, I am sweating a lot.

The Covid-19 pandemic has had an impact on both cities and mobility. In the US, for example, streets were closed to cars when the toughest restrictions were in force to give people more space outdoors. Many cities also built more bike lanes. The popularity of cycling has increased tremendously during the pandemic, which can be seen in both traffic volumes and a shortage of bicycles. Due to production chain problems caused by the pandemic, bikes and spare parts are not always available. In addition to conventional bikes, electric cargo bikes are also popular. The increased interest in cycling is also expected to be reflected in improved health.

Health is also sought in parks, which have also been popular during the pandemic. In Singapore, therapeutic parks have been built for several years and a recent study shows that parks have positive effects on both physical and mental health. New parks and urban forests are being planted in many cities, partly for health benefits, but also because of the climate crisis. Trees even out temperature fluctuations and cool cities during the worst heatwaves.

What if the experiments carried out during the pandemic to make cycling and

walking easier were made permanent? What if cities built more parks and bike paths instead of streets and parking lots? How would the future urban landscape look?

What if we move out of the cities?

■ *A city-country-dweller? More like a country-city-dweller, I think as I pedal past the mushroom fields shaded by solar panels away from the village hall. Others don't seem to understand why I still want to visit concrete suburbs when there are jobs closer to home. But I'm fascinated by restoring urban environments and ecosystems in the shadow of those gloomy grey walls.*

Covid-19 influenced internal migration in Finland. Of course, migration to rural areas or hopes of it was already in the headlines before then. In the broader picture, urbanisation or the concentration of settlements in and around growth centres continues, but this trend is challenged and diversified, especially by multi-locational living. Some people have become city-country-dwellers, living and spending time in several locations. Multi-locational living is also increased by caring for a relative living in another place. What solutions could be found for multi-locational care?

The EU Ruralization project lists several trends and weak signals affecting rural living (Kuhmonen et al. 2021). They include low-cost housing, energy communities, an emphasis on self-sufficiency and different forms of communality. As fossil fuels are phased out, locally produced energy and also other local production may become more prominent. What would this kind of a rural area, dotted with self-sufficient local communities, look like?

People often move for work. Teleworking, which has become more common during

Covid-19, can bring flexibility in the choice of where to live. In the future, though, there may be more and more work found in rural areas. With ecological reconstruction, Finnish food production will become both more self-sufficient and diverse, and it will require more labour (Järvensivu & Toivanen 2018). Sequestering carbon in the soil, restoring habitats and rural tourism will create more jobs. What if people move to the countryside for work in the future? What would cities look like then?

What if hardly anyone ate meat or drank alcohol?

■ *Well that was a classic film, I say to my mother as we leave the cinema. Insane use of intoxicants and cruelty to animals. My mother tries to explain to me that it didn't feel like that at the time – that kind of alcohol use and meat-eating was completely normal. I shake my head. I wonder what my kids will find astonishing in today's customs.*

The 2019 weak signals survey states that in the future the present treatment of animals may seem unimaginably cruel. Animal production and eating meat still evoke strong emotions. At the same time, there are many more options available than in 2019, and the popularity of different vegetarian and vegan foods is rising fast. This can also be seen in restaurants, whether à la carte or burger. What if meat was a specialty that should you had to asked for separately in a restaurant?

In addition to a plant-based diet, non-alcohol is increasingly on the menu, as already mentioned in the introduction. The popularity of non-alcoholic beverages can be seen in Alko's sales. Mocktails, or alcohol-free cocktails, have become more common, and there is even non-alcoholic 'spirit'. Not using alcohol has also become more commonplace,

and it is discussed in podcasts, for example. What if alcohol was no longer used? What would the party culture look like, and what would it be like to go out on the town to party?

Food for thought: What if cities became independent states?

When the UK decided to leave the EU, 50,000 Londoners demonstrated, demanding that the city become independent and remain in the EU. Cities play a central role in tackling many global challenges, such as the

climate crisis, and their decision-making is usually closer to people. What if cities became even more independent and new city states – and perhaps federations of them – emerge? What would a city state of the future look like?

Read more: [Futures Platform / Max Stucki & Trey Tran](#)
[5.11.2019: City States – The Wave of the Future?](#)

SIGNALS

What sort of signals can you recognise about the city, leisure, shopping, eating and drinking? Here's a list of the signals underlying this chapter.

PAYING BY POSTING ON SOCIAL MEDIA

A Toronto pop-up store does not accept cash; the only way to pay is by making a post on social media and tagging the shop.

Source: The Varsity / Cherry Zhang 26 September 2021. [Reviewing Pick-Me-Ups, a Toronto pop-up that uses social media as currency.](#)

GROCERY CHAIN'S REALITY TV SHOW

In summer 2021, Prisma launched a marketing concept in which celebrities competed in shops and created content for their own social media channels.

Source: MarkkinointiUutiset / Toni Rajamäki 21 June 2021. [S-ryhmä loi täysin uudenlaisen markkinointikonseptin: kuusi julkisuudesta tuttua henkilöä kisaa Prisman oman tosi-TV-formaatin voitosta.](#)

RETURN OF REPAIRING

Consumer's options for repairing products are improving, and artists are creating new ways to use broken objects.

Source: The Guardian / Katie Reggiden 22 August 2021. [Back for good: the fine art of repairing broken things.](#)

VEGAN LEATHER FROM APPLES

Beyond Leather produces authentic-looking artificial leather by combining rubber and waste from apple juice production.

Source: Dezeen / Jennifer Hahn 14 July 2021. [Leap is a vegan leather made from waste apple cores and skins.](#)

LEATHER BAG MADE FROM MUSHROOMS

The luxury brand Hermès has begun to make bags out of artificial leather made from mushrooms.

Source: The Beet / Hailey Welch 12 March 2021. [Hermès Produces Its First Vegan Leather Handbag Made From Mushrooms.](#)

CLOTHES FROM DUNG

A Dutch growth company is developing technology to extract cellulose from cow dung for use in such products as clothes or paper.

Source: Inspidere B.V. / [Mestic®](#)

STREETS FOR PEDESTRIANS AND CYCLISTS DURING THE PANDEMIC

Oakland closed down more than 100 kilometres of roads from cars to make way for pedestrians and cyclists during the pandemic restrictions.

Source: SFist / Jay Barmann 10 April 2020. [Oakland Is Shutting Down 74 Miles of City Streets to Make More Room For Runners and Cyclists.](#)

BICYCLE PATHS TO CITIES

Cities around the world have increased bike lanes during the Covid-19 pandemic.

Source: People Powered Movement. [Cities Around the World are Adding Bike Lanes Thanks to Covid-19.](#)

CYCLING BOOM

People have taken to cycling during the Covid-19 pandemic. This is driven by a desire to improve fitness and avoid public transport.

Source: BBC / Adrienne Bernhard. [The great bicycle boom of 2020.](#)

GROWING POPULARITY OF CARGO BIKES

Sales of electric motorised cargo bikes are growing rapidly in Europe.

Source: Treehugger / Lloyd Alter 20 November 2020. [We're in an Electric Cargo Bike Boom.](#)

THERAPEUTIC PARKS

In Singapore, therapeutic gardens and other wellness features have been established in parks for several years now.

Source: National Parks Board, 22 October 2021. [Therapeutic Gardens.](#)

NATURE IMPROVES WELLBEING IN CITIES AS WELL

According to a new study, access to nature in cities increases people's wellbeing.

Source: Stanford University / Sarah Cafasso 10 May 2021. [Stanford researchers map how people in cities get a health boost from nature.](#)

URBAN FOREST IN PARIS

A total of 40 hectares of new urban forest is to be planted in Paris by 2026, replacing such things as roads.

Source: Viherympäristöliitto / Virpi Latva April 2021. [Kaupunkimetsä valtaa Pariisin.](#)

COUNTRY-DWELLING CITY-DWELLERS

An increasing number of city-dwellers want to live in the midst of nature while holding on to city life.

Source: Citymaalaiset, 10 October 2019. [Citymaalaiset ovat täällä.](#)

MULTI-LOCAL CARE

Increasing multi-locality adds new challenges but also opportunities to the delivery of care services.

Source: Maaseutuparlamentti 2021 / Kati Pitkänen & Mari Kattilakoski 19 February 2021. [Monipaikkainen hoiva maaseudun tunnistamaton mutta kasvava ilmiö.](#)

MOVING TO THE COUNTRYSIDE ON THE RISE

According to surveys, many people want to move to the countryside, and the emphasis on self-sufficiency and local production may support migration.

Source: Maaseudun Tulevaisuus / Tuomas Kuhmonen 7 June 2021. [Ikkuna muutokseen auki – onko maaseutu valmis?](#)

SALES OF READY-TO-EAT VEGETARIAN DISHES ARE GROWING

According to S grocery shops' statistics, sales of plant-based proteins and ready-to-eat vegetarian dishes have grown significantly.

Source: S-ryhmä, 18 November 2021. [Broileri ohittaa ensimmäistä kertaa possun, kasvisvalmisruuissa huikea kasvu.](#)

MEAT-FREE HAMBURGER RESTAURANT

Burger King has opened a restaurant that exclusively serves vegetarian food in Madrid.

Source: Mashed / Lucy Maddox 26 October 2021. [This International Burger King Location Just Went Totally Meat-Free.](#)

MEAT-FREE FINE DINING

Several of the world's top-rated restaurants best have dropped meat from their menus.

Source: Food & Wine / Mike Pomranz 17 November 2021. [Another 'World's Best' Restaurant Is Dropping \(Most\) Meat from the Menu.](#)

NON-ALCOHOLIC BEVERAGES FROM ALKO

Non-alcoholic beverage sales have increased at Alko, the national alcoholic beverage retail monopoly in Finland.

Source: Helsingin Sanomat / Joonas Laitinen 11 March 2021. [Alkon myynti kasvoi roimasti helmikuussa, ja perinteisen viinamonopolin kuumimpia trendejä on nyt alkoholittomuus – tästä sober curious -ilmiössä on kyse.](#)

NON-ALCOHOLIC SPIRIT

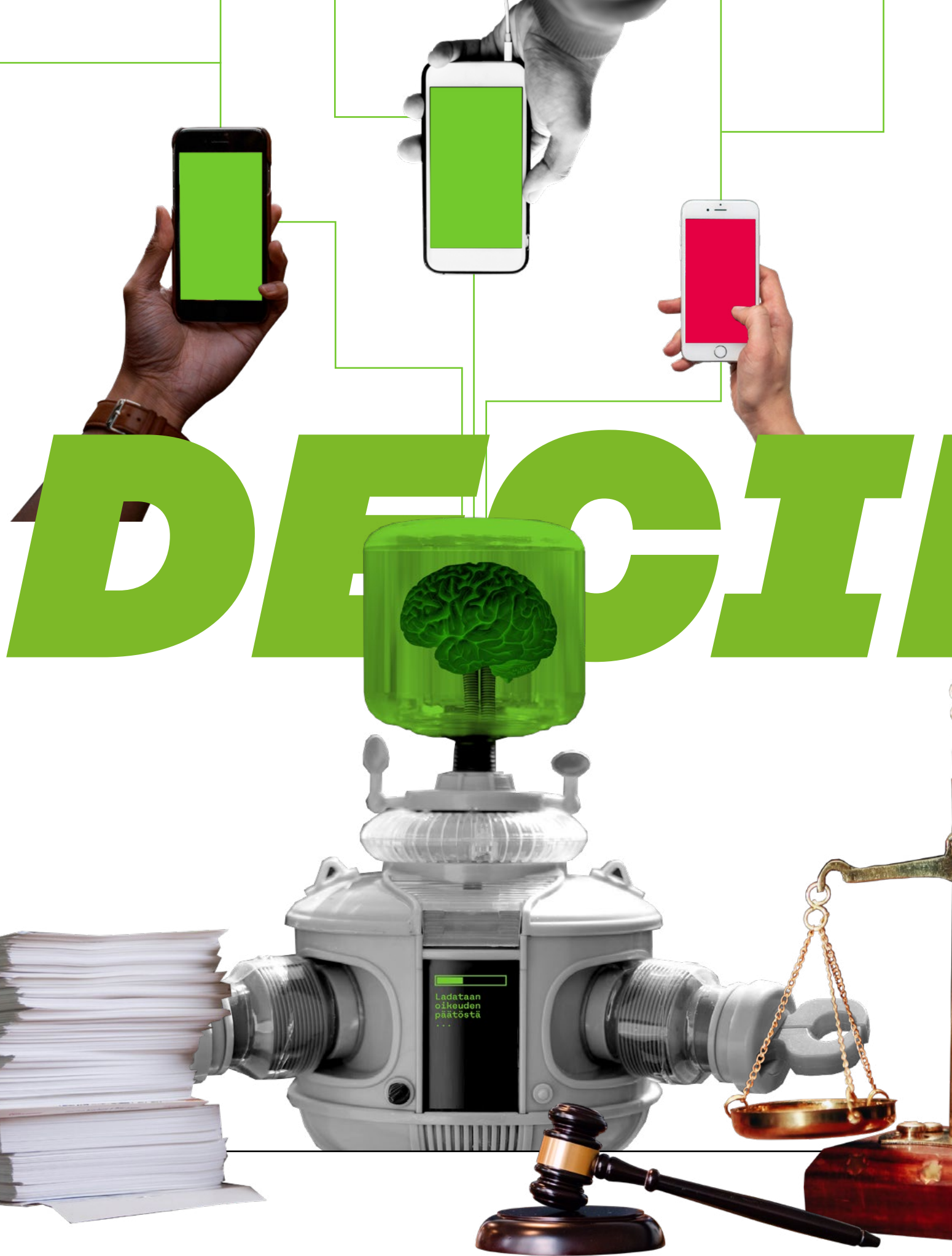
A Helsinki-based distillery has created a non-alcoholic beverage that can be used like gin.

Source: MTV Uutiset / Petra Tuominen 1 September 2021. Nyt tulee Suomen ensimmäinen viinaton viina!
Helsinkiläistislaamo vakuuttaa: "Se ei ole makuvettä".

A PODCAST ON BEING ALCOHOL-FREE

Darravapaana is a podcast on drinking culture and the normative use of alcohol.

Source: Darravapaa.fi / Laura Wathén & Katri Ylinen. Darravapaana-podcast



Deciding

How will decisions be made in the future? What are the signals involved? There are many places where decisions are made, so this chapter focuses more on the status of decision-making.

DECIDING



In February 2021, *The Economist* wrote that democracy has had a very bad year. The Covid-19 pandemic contributed to the erosion of civil liberties and strengthening of authoritarian governments. At the same time, network-based power drawing on the interaction of large numbers of people has strengthened. The increasingly tense geopolitical situation adds to this situation.

Postnormal times have entered the political arena in a big way. The agenda is continuously changing in the face of surprises and crises, while trying to return to the old order of the day. But the environmental crisis, the pandemic and hybrid warfare do not allow for maintaining a bubble of artificial normality, but for the constant need to step out of it to put out new fires. The Italian Marxist Antonio Gramsci, writing in 1930, summed up the situation: “The crisis consists precisely in the fact that the old is

dying and the new cannot be born; in this interregnum a great variety of morbid symptoms appear.” (Gramsci 1982)

What are the signals of the death of the old or birth of the new? What if algorithmic democracy becomes even stronger and takes new forms as artificial intelligence develops? Or what if crises become chronic and are used as a pretext to impose new and severe restrictions on people and businesses? Or perhaps trust in society will collapse completely as a result of dissatisfaction with decision-makers or polarising debate.

It is essential for strengthening democracy to not only consider these challenges, but also to look beyond them for new opportunities. What new ways of influencing have already emerged and what could decision-making at local and global level look like in the future?

What if algorithms will decide on everything?

■ *Today, I would like to change my opinion. I just don't know how. Everything is so automatic. Perhaps the algorithm just notices my change of view from my eating habits or viewing history? Or can it read my values from how I walk? Of course, I could ask a chatbot about it, but I have never been able to get them to fully understand. I wish there was someone somewhere I could ask.*

The use of algorithms to support decision-making has grown significantly in recent years. Only events where artificial intelligence is appointed to a company's management team usually make headlines. However, the use of algorithms based on increasing amounts of data or character recognition, for instance in loan decisions or processing insurance claims, has become more common. Besides businesses, individuals also use algorithms as a sort of artificial intelligence to support their decision-making. Algorithms play a major role in many people's lives, partly unnoticed, in telling them about the quality of their sleep, state of alertness or most interesting news of the day.

Algorithms also drive day-to-day political life. They are used to customise messages addressed to different groups, assess the chances of success of proposed legislation and to both contain and spread fake news. Artificial intelligence has already been consulted at a session of the parliamentary Committee for the Future. More than half of Europeans would also be prepared to replace members of parliament with an algorithm with access to their data. It's even more popular in China – three quarters are in favour of the idea – while in the US 60% are against the idea. What if algorithms replaced experts and politicians in decision-making?

The growing power of algorithms in decision-making raises concerns about their

transparency, the data they use and vested interests. For example, an algorithm produced through deep learning can take so many things into account and be so complex that a human being simply cannot understand how it works. What is the correct balance between comprehensibility and accuracy when it comes to justifying a decision that affects people's lives?

For all hype about artificial intelligence, algorithms do not think or act on their own. There is always a group of people behind them, deciding, say, on the data to use and how the algorithm will work, among other things. The data used and choices made easily lead to the replication of old power structures. For example, an algorithm may assume that doctors are men and nurses are women, or recommend harsher punishments for people of colour. A particular problem is that the algorithm's rationale for its decision is often not even understood. For example, Facebook's content monitoring algorithm has blocked ad campaigns and many discussion boards of small businesses after incorrectly interpreting them to have broken the rules, but could not specify how. If algorithms decide on everything, who can we complain to?

What if the restrictions are tightened?

■ *I pile groceries into my trolley. Fortunately, I no longer have to think about whether this soy patty was sustainably and ethically produced. Or wherever the data on my purchases will go. "Overly regulating Finland" has in fact turned out to be a nice place to live. I don't always understand all the regulations, and conspiracy theorists naturally come up with all kinds of motives behind them. But at least the burden of saving the world is no longer on the individual.*

During the pandemic, we have become used to different kinds of restrictions. While the regulations, recommendations and hybrid strategies may have seemed confusing at times, they have led to greater awareness of what the government, Parliament and authorities can and cannot do. Politics has come closer to the daily lives of more and more people.

But the pandemic is not the only crisis we currently face. The climate crisis and biodiversity loss require urgent decisions and measures. What if we adopted a similar attitude to them as to the pandemic? Today, businesses are being asked to assess and explain increasingly clearly how the climate crisis will affect their operations. In addition to environmental responsibility, responsibility for human rights is also emphasised. Increasingly, companies are expected to act in a measurably responsible way, and pioneers will be better prepared for the potentially tight restrictions that lie ahead.

Tighter restrictions may also apply to social media and technology giants. In autumn 2021, it was revealed that Facebook had long been aware of numerous problems with its platform but had done little to fix them. The trust in technology giants' self-regulation is low, especially in the EU. In fact, the EU has already pushed through several regulations regarding people's privacy and managing your own data. What if technology companies and digital services were regulated much more strictly?

If restrictions are tightened in response to undesirable developments, who will decide on the restrictions and how? Many governments use their power to remove material from digital platforms that is problematic for those in power, including opposition apps or dissenting voices. At the same time, many choices are being politicised, both around the world and in Finland.

Because we are in the middle of major changes, the future will bring surprises at an ever-increasing pace. This will require quick decisions and fending off undesirable devel-

opments. But it is also increasingly important to be able to justify decisions taken in a transparent and informed manner, because the risk of abuse of power is high in the midst of polarised argument and major upheavals.

What if trust in society collapses?

/// There they go again those nutters, at least leave the day-care centres alone. I don't dare go and start an argument with them, you never know where they - or maybe the police coming to help them - are coming from. Sometimes you wonder: what if I'm the trouble-making loonie? But I'm not alone in my thoughts.

Politicians are expected to have a clear vision of a better future and to make credible, informed decisions to get there. But these are not deemed to be on offer, and it is easy to see day-to-day politics as bickering and horse-trading. The erosion of trust in decision-makers and the social system does not apply to democracies only, as people are increasingly challenging authoritarian regimes too.

Young people are calling for action to tackle the climate crisis, including an immediate end to fossil fuel subsidies and significant investment in renewables. They often end up disappointed as sufficient decisions are simply not taken. Young people are interested in influencing society, but not in party politics. Their trust in politicians and political institutions – parties, Parliament, the government – is continuously declining.

People's trust in decision-makers and authorities is also eroded by conspiracy theories and the feeling of having been conned. On social media, wild theories and fake news spread fast, and it is easy to find like-minded people. Confusion is deliberately sown with

the aim of undermining trust. Beliefs based on fake news also lead to action, such as harassment at schools or, in the worst cases, violence. For example, the misogynistic Incel movement has been linked to several mass shootings.

So trust is eroded by both the scientifically justified dissatisfaction with the current response to the environmental crisis and the diverging realities that arise from fake news and confusion. What if people lost all confidence in democracy, society and the authorities? What if at the same time we live in completely different perceived realities? How would society work in such a situation?

What if power is devolved?

It is always a stress, meeting new people. I try to judge their views based on the way they look. Not to categorise them, but to better identify my own prejudices. In case I'm surprised again. My heart is racing as we sit in a circle. I'm more into digital protests, but click democracy alone won't get us far. You need these real encounters and to talk things through and weigh things up together.

While trust in conventional ways of influencing has decreased, new ones have emerged. Ten years ago, Occupy Wall Street introduced an alternative to demonstration marches: sustained non-violent resistance based on dialogue, engagement and self-organised groups. The Extinction Rebellion movement, for example, is doing the same kind of advocacy based on civil disobedience, social media and open communality.

Social media and digital platforms play a key role in both organisation and communication. Communities of people interested in the same things also play a role, even if they have no clear link to the issue being opposed.

Social media and fandom quickly mobilise large masses of people.

New ways of influencing, such as social media campaigns, can stir up confrontation, but there are also signs that pluralism is being championed and confrontation reduced. What if, while seeking a change to the wrongs of today, we tried to increase understanding between the different sides? This opposition to confrontation can be seen, for example, in the uproar caused by a reality TV show based on activism. The original plan was to set teams fighting for different causes against each other, but after criticism, the programme was changed into a documentary following the activities of the different teams.

What if the methods of direct influence described above become mainstream and replace the conventional ways of influencing? What would decision-making with an emphasis on radical engagement, open communality and dialogue be like?

Food for thought: What if Finland were a monarchy?

In considering Finland's future, the continuation of democracy is usually taken for granted. But events in other countries show that the foundations of democracy can crumble surprisingly fast. What if admiration for strong leaders or dissatisfaction with the current system leads to a different social system? What would Finnish royalty be like?

Read more: [Christian Grünwald ym.: Wild card #6: Strong leadership sought - a majority wants to return to the monarchy. Wild cards: preparing for the unexpected, 2021](#)

SIGNALS

What sort of signals can you recognise in connection with decision-making and democracy? Here is a list of the signals underlying this chapter

ARTIFICIAL INTELLIGENCE IN DECISION-MAKING

Businesses have deployed artificial intelligence to support decision-making in a wide range of applications, and this has also changed the way decisions are made.

Source: MIT Sloan Management Review (MIT SMR) / Philip Meissner & Christoph Keding 12 October 2021. [The Human Factor in AI-Based Decision-Making](#)

MACHINE LEARNING IN POLITICS

The analysis of large data sets, machine learning and artificial intelligence have become more common in political campaigning and to support political decision-making.

Source: Center for Strategic and International Studies (CSIS)/ Jeff Berkowitz 21 December 2020. [The Evolving Role of Artificial Intelligence and Machine Learning in US Politics.](#)

ALGORITHM CONSULTED BY PARLIAMENTARY COMMITTEE

The Committee for the Future consulted the natural language-producing GPT-3 algorithm, taught using two different text materials.

Source: Parliament of Finland, 9 April 2021. [Tulevaisuusvaliokunta kuuli tekoälyä tiettävästi ensimmäisenä valiokuntana maailmassa.](#)

ALGORITHM WANTED TO REPLACE MEMBERS OF PARLIAMENT

More than half of Europeans support the idea of reducing the number of MPs and replacing them with an algorithm with access to data on people's interests.

Source: Center for the Governance of Change (CGC) / Oscar Jonsson & Carlos Luca de Tena 2021. [European Tech Insights 2021. Part II Embracing and Governing Technological Disruption.](#)

INCOMPREHENSIBLE ARTIFICIAL INTELLIGENCE

As algorithms evolve, they become increasingly difficult to understand.

Source: Medium, Towards Data Science / Cyprien Nielly 12 February 2020. [Can we let algorithm take decisions we cannot explain?](#)

ARTIFICIAL INTELLIGENCE CENSORS ADVERTISING

The algorithm that supervises Facebook content has incorrectly removed small business' advertisements.

Source: FORTUNE / Bloomberg & Sarah Frier 28 November 2020. [Facebook's AI is mistakenly banning some small business' ads.](#)

CLOSING DOWN DISCUSSION GROUPS

Facebook's tightened algorithm has blocked discussion groups due to suspicions of hate speech, and tight restrictions on discussion have raised concerns about free speech.

Source: Yle / Sanna Vilkinen 1 February 2021. [Facebook sulki yhden Ruotsin suurimmista naisten kohtaaispaikoista – tutkija arvelee, että lisää vastaavia keskusteluryhmien vaientamisia on luvassa.](#)

TAKING CLIMATE RISKS INTO CONSIDERATION IN BUSINESSES

The US Securities and Exchange Commission is starting to require companies to report how they take account of the risks brought about by the climate crisis in their operations.

Source: Harvard Law School Forum on Corporate Governance / Sarah Solum, Valerie Ford Jacob, and Michael Levitt, Freshfields Bruckhaus Deringer LLP 1 September 2021. [The SEC's Upcoming Climate Disclosure Rules.](#)

INTERNATIONAL CLIMATE RISK DISCLOSURE RULES

IFRS, the party that prepares international standards for the financial sector, announced the creation of a new body to develop climate risk disclosure rules for financial markets.

Source: The National Law Review, Volume XI, Number 316 / Jacob H. Hupart 12 November 2021. [New Standard-Setting Body for Climate Change Disclosures Announced at Glasgow Climate Change Conference.](#)

STRICTER SUSTAINABILITY REPORTING

The EU Commission intends to extend and tighten companies' sustainability reporting.

Source: DQS CFS GmbH - German Association for Sustainability / Annabell Schäfer 27 May 2021. [Stricter CSR Reporting Requirements in the EU from 2023: Will External Assurance Become Mandatory?](#)

DATA LEAK CONCERNING FACEBOOK'S OPERATIONS

Publicly leaked internal documents reveal that Facebook is well aware of problems relating to its platform but is slow to react.

Source: The Wall Street Journal, 2021. [The Facebook Files - A Wall Street Journal investigation.](#)

EU'S TOUGH STANCE ON TECH GIANTS

The European Commissioner for Competition and Executive Vice-President for A Europe Fit for the Digital Age Margrethe Vestager is pushing for stricter regulation of digital platforms.

Source: Yle / Elli-Alina Hiilamo & Anna Karismo 29 October 2021. [Tämä nainen määrittää digijättien kohtalon Euroopassa – Facebookia vastaan on toimittava nopeasti, kilpailukomissaari Margrethe Vestager sanoo.](#)

APP STORE CENSORSHIP

Google and Apple removed the opposition's tactical voting app from their app stores following pressure from Russia.

Source: Helsingin Sanomat / Henri Häkkinen 17 September 2021. [Google ja Apple poistivat vangitun Aleksei Navalnyin äänestyssovelluksen sovelluskaupoistaan – Kreml: Yhtiöt noudattivat Venäjän lakia.](#)

POLITICIANS TO DECIDE ON APPOINTING DOCTORS AND TEACHERS

An amendment to the administrative statute of the City of Pieksämäki transferred appointments, including appointing doctors and teachers, to committees.

Source: Pieksämäen Lehti / Veera Järvenpää 26 March 2021. [Kolumni: Pieksämäellä poliitikot päättävät nyt, kuka opettaa lastasi – vielä kun joku selittäisi ymmärrettävästi, miksi.](#)

CITIZENS AS A THREAT TO THE STATE

China is tightening its reins on the freedoms for citizens and businesses in a bid to curb opposition to authoritarian rule.

Source: Helsingin Sanomat / Mari Manninen 8 September 2021. [Kiinan johto karsii nyt "hömppää" kansalaisiltaan – Jos kansa uskoisi kommunistisen puolueen ideologiaan, tällaisia toimia ei tarvittaisi, sanoo tutkija.](#)

DISAPPOINTED AND DETERMINED YOUNG PEOPLE

Young climate activists are repeatedly disappointed with politicians and the inadequacy of current policies, but they are not giving up.

Source: Human Rights Watch / Juliane Kippenberg 9 November 2021. [Youth Activism on Climate: "I Am More Determined Than Ever".](#)

YOUNG PEOPLE PREFER DIRECT ACTION

Young people are disappointed in party politics and the functioning of democracy, and prefer more direct ways to have an influence, such as demonstrations and online campaigns.

Source: Ulkopoliitiikka / Matti Koskinen 11 March 2021. [Nuoret radikaalit – puolueisiin pettyneet sukupolvet uudistavat politiikkaa.](#)

UNRULY ANTI-VAXXERS NEAR SCHOOLS

Those opposing Covid-19 vaccinations have been unruly and spread misinformation about vaccines at schools.

Source: Iltalehti / Aleksanteri Pikkarainen 13 August 2021. [Rokotusvastainen miesjoukko häiriköi ja kuvasi koululla – poliisi tuli väliin: "Päätetään pois, kun koulut menevät kiinni"](#).

INCEL MOVEMENT

The Incel movement, which feeds on misogyny and bitterness, is violent radicalisation that has manifested itself in acts such as mass shootings.

Source: Maailma.net / Elina Nikulainen 7 September 2021. [Naisvihasa on kyse väkivaltaisesta radikalisaatiosta, jonka uhriksi voi joutua kuka tahansa](#).

ONLINE ACTIVISM ON TIKTOK

When a website for reporting those seeking abortion was launched in Texas, an activist spoke on TikTok about how to flood the site with fake reports.

Source: VICE / Joseph Cox 2 September 2021. [TikToker Makes Script to Flood Texas Abortion 'Whistleblower' Site With Fake Info](#).

BLOCKING REPORTING CHANNELS WITH K-POP

Dallas police requested videos of illegal activity during the Black Lives Matter protest, and to oppose this, fans of Korean pop music replied by sending massive amounts of videos of the boy band BTS.

Source: Vanity Fair / R.O. Kwon 6 June 2020. [BTS and K-Pop Fans Strike a Blow to Support #BlackLivesMatter](#).

A LIBRARY FULL OF CONVERSATION PARTNERS

The Human Library does not lend books but conversation partners with the aim of bringing different stories to the forefront.

Source: [The Human Library®](#)

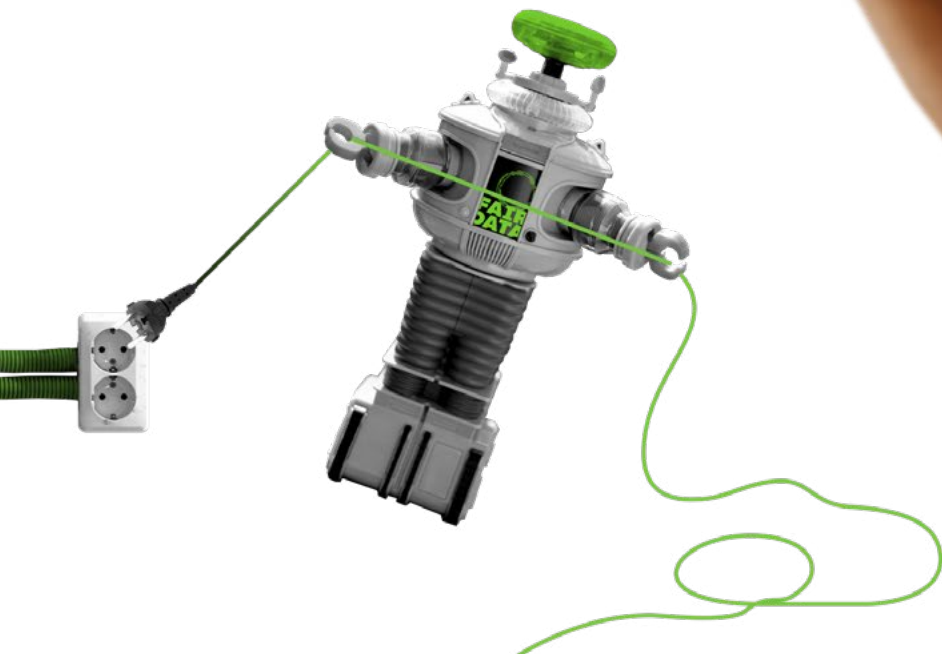
ACTIVISM AS REALITY TV

A planned reality TV show based on a competition between activists was turned into a documentary following up the activities of activists due to the uproar it caused.

Source: Yle / Sanna Vilkmann 17 September 2021. [Aktivismin valjastaminen tosi-tv-viihteeksi nosti äläkän – kritiikkimyrsky sai The Activist -kisan tekijät perääntymään](#).



IN THE MET



In the metaverse

We used to talk about surfing the information highway, now it's about social media bubbles and the metaverse. What about tomorrow? What will the digital environment and our activity in it be like the future?

FAVERSE



We spend more and more time in digital environments. E-mail, social media, news, TV shows, the latest hit recipe – it is all just a click or tap away. And even if we don't consciously visit this place, our information is there whenever we shop or move in the urban environment with a smart device.

For some time now, futurists and technology enthusiasts have been talking about the metaverse, which has become more commonly known with Facebook's name change. The name dates back to Neal Stephenson's 1992 science fiction novel *Snow Crash*.

The metaverse refers to the environment where our digital and physical worlds are tightly intertwined. Alongside the web, the metaverse is forecasted to increasingly involve virtual and augmented reality and, in

particular, the efficient use of vast amounts of data. The term "metaverse" seeks to conceal many of the problems already familiar in the current digital world, such as the erosion of privacy, the rapid spread of misinformation, hate speech and inflamed opinions.

Before we leap into this world of blue-glowing bits, we should take a look at the changes and phenomena bubbling under the surface. Where will the development and everydayisation of data manipulation lead, and who will determine the direction of development? What problems are already lurking in the metaverse and how might they escalate in the future? What is the physical basis of the metaverse and how solid it is? And what do we actually want from this metaverse?

What if it's all an illusion?

■ *Meta's CEO Mark Zuckerberg stands in front of me, and tells me in fluent Finnish about the metaverse's new marketplaces and payment methods. Or at least I think so. I mean, he's not physically there, of course, and does not actually speak to me or even in Finnish, but I am not sure whether the recording is genuine or someone's joke. For a joke, the speech is unduly boring. It is interrupted by an advertisement for another new virtual world of plot sales. I try to swipe it away but only manage to turn the volume up. I sigh. This bungle means more ads for "Learn to control virtual reality" courses.*

In concept videos from tech companies like Facebook and Microsoft, fit young people wave their arms excitedly, conjuring up convincing-looking vistas bursting with information. The boundaries between places are promised to become even more blurred. The idea is that more and more time will be spent in virtual worlds, whether it's a meeting in a virtual boardroom or a concert of superstars turned into virtual avatars. The Covid-19 pandemic has boosted the development of diverse services and made them known more widely.

But the metaverse is not just about hanging out, it is also about commerce. But how to trade things that are easy to reproduce – after all, one of the benefits of the digital world is that files are easy to copy? Here, blockchain technology and NFT (Non-Fungible Token) enter the picture. This is a token attached to a digital object, such as a work of art or virtual plot of land, making it possible to create reliable and openly verified ownership.

The NFT market is currently hot, with a lot of novelty and speculation in the air. There are avatar costumes, artwork and even

virtual plots – ownership rights to a piece of the virtual world – for sale. Because virtual worlds are being explored as avatars representing the user, they are increasingly being marketed as such. You can, for example, buy fashion clothing for your avatar on digital platforms. Not all commerce is virtual, however, you can also order a real pizza to your door from the virtual world. In Decentraland, you can direct your avatar to a virtual pizza stand, pay in cryptocurrency and order a real pizza to your door.

The metaverse further blurs what is real and what is not. Face swap in videos has become a fun thing available to everyone – who wouldn't want to see Minna Canth sing "I will survive"? And because face swapping can also be done in real time, you can pretend to be whoever you want in remote meetings. In virtual worlds it is already assumed that nothing or no one is exactly what they seem. At the same time, algorithms mine your ever-growing digital footprint for more information about who you really are. It is because of the digital footprint that the competition for this virtual world is very real, and big tech companies are racing to develop solutions and share their own visions of what the future metaverse will be like.

Sitra's 2019 weak signals study discussed how problematic it is when people are flattened into a digital footprint. This concern is increasingly relevant. Facial recognition has developed in leaps and bounds, and different emotions are now analysed based on facial expressions. In addition to facial recognition, other measurements, such as brain activity or heart rate are also being developed. There is a risk of drawing too far-reaching conclusions are made on the basis of data masses. Humans are not sets of data points, no matter how you measure them.

The artist Hito Steyerl talks about apophenia and corporate animism (Steyerl 2016). Apophenia means seeing non-existent connections or patterns. Examples are

inferences about a person's political orientation based solely on their face. Corporate animism, on the other hand, refers to the magical belief that massive amounts of data reveal their wisdom when coaxed by the right spellbinding algorithms. Technology can easily feel like magic when you don't understand it. What if we are building ourselves a world in which we no longer know what is real and what is illusory?

What if the digital world were only allowed in small doses?

■ I tap my knees with my fingers. My hand is drawn to my smart device – just a little peek. I imagined this forced digital abstinence would be easy when I gave up my smart glasses, but there's a strange siren call with that smart thing. I am glad that I have fellow fatalists struggling with this same addiction now that screen time is limited by law. I do understand the reasons – public health and the environmental crisis – but just a little peek?

The metaverse might seem like a bit-based world appearing out of thin air, but it is based on enormous amounts of cable, servers, hardware and electricity. Even today, the energy consumption of the digital world is expected to grow. While the metaverse promises to reduce travel, for example, it also requires more data transfer, new servers, faster networks, new devices – in effect, more energy and resources. The author Andreas Karelas has aptly stated that it is not possible to create a metaverse where climate change does not exist (Karelas 2021).

Part of the enthusiasm for the metaverse is precisely about starting with a clean slate and escaping the present. With virtual glasses on, you can dive into dream worlds and forget the problems of the real world. But the

metaverse is not built from scratch, and it can actually worsen real-world problems, such as gaming and social media addictions, inflamed opinions and the spread of disinformation. At the same time, new health problems and increasing inequalities may emerge – not everyone can afford or have access to virtual worlds.

What if the metaverse started to come under heavy handed restriction? In China, the state already restricts under-aged children's gaming and "external paid tuition", justifying the restrictions in particular as cracking down on gaming addiction. But they can be seen as part of a wider effort to restrict freedom of expression and prevent the spread of Western influences. The EU imposes restrictions on the technology companies offering services, with the aim of safeguarding individuals' rights and levelling the playing field between small and big companies. Environmental issues are also high on the agenda.

A separate question is the rules of data use, where the EU, US and China have very different policies. The previously mentioned measurement and use of brainwaves and other data and the use of the data collected from them will also add a new dimension. Chile wants to be one step ahead and prevent mechanical mind-reading, which increased data and advanced algorithms might enable in the future. How will people's neurorights, or the privacy of people's thoughts, evolve in different parts of the world?

Restrictions raise the question of the role of the state and other actors and ways to prevent abuses and harmful behaviour. What rules are needed to minimise the harmful effects of the metaverse – and who should set these rules? Should spending time in the metaverse be restricted in the name of the environment and health? What would it look like then?

What if there's no electricity?

/// *I curse in my mind as the bars drop to zero. Why did I have to stay and tweak the message? Now, I don't know when the network will be up again so that I can send the it. Is it a blackout or a wider cyberattack? Well, I don't know when he would have read the message or if he has already opted out of everything digital.*

The metaverse is described as being located on top of, around and separate from the physical reality. In it, we are simultaneously in the physical and virtual environment, and the two are intermixed. The visions understandably pay less attention to the vulnerability of the metaverse, whether to attack and misuse or disruption of the physical environment.

However, the metaverse can disappear as a result of an environmental upheaval. A strong solar storm (an intense particle burst in the Sun), for example, can collapse both the power grid and data networks. The Finnish grid might endure even a more severe solar storm, but of course what happens elsewhere will also affect Finland. Locally, the network can also be lost without a major upheaval, such as if rats gnaw the cables.

The more activity there is in the metaverse, the more attractive it is for abuse. Cyberattacks and the hijacking of digital services are already affecting people's lives, whether cyberattacks on a hospital or making drones plummet from the sky. Technology is always susceptible to misuse, and remote connections further increase the potential for misuse.

Virtual reality is associated with new forms of abuse. Virtual reality devices, like other networked devices, are prone to eavesdropping. However, virtual reality can also be modified to make the user feel nauseous, or

steer them in a desired direction without them realising it, such as bumping into walls.

The unreliability of the metaverse can deter users, but so can conscious resistance to the excesses of digitalisation. Digital minimalism, the pruning of digital services, has been proposed for several years. For instance, new make-up styles have been developed to counter facial recognition. There are also social media platforms that guide people to send fewer messages.

Despite the countermeasures, we are becoming increasingly dependent on digital services, and the visions of the metaverse only increase this dependence. This becomes evident in exceptional situations. When the services of Facebook, and therefore also WhatsApp, were down in autumn 2021, many Finns had trouble communicating with their families or hobby groups. A six-hour outage on one service is a minor nuisance, but what about longer outages? How can today's society cope with days or even weeks without electricity or telecommunications?

What if we create communality beyond people?

/// *I chuckle at the latest meme. It's cool to be part of this squad, this is so my community. The meme opens up a joint work of art that I see has got new buds again. I highlight a few directions that I think the most promising. My smart tattoo hums silently and I take a deep breath. I guess it is raining in my nearby forest.*

The internet is decentralised by design. But today the services that we use the most are concentrated in a few technology giants. The same companies are also actively driving the metaverse that they could ultimately own. However, more decentralised ownership

models do exist. Blockchain-based DAOs, or decentralised autonomous organisation, are member-owned collaboration platforms with decentralised decision-making. For example, the Decentraland virtual world is backed by a DAO that decides its rules.

What if we began to talk about the fediverse instead of the metaverse? This refers to social media and collaboration platforms running on independent servers, making up a network and being able to freely exchange data. What is essential is that they are based on open-source code so that anyone can establish their own service, and a protocol, that enables data sharing.

Besides the technological solutions, it is also important to foster a common culture and a cherishing of constructive dialogue. Groups, or squads, form around common goals, views and aesthetics, and together they are constantly shaping their own image – or, in other words, growing their social capital. This can be seen as a counterreaction to the “internet of beefs” familiar from today's social media platforms, where others are challenged to debate without any intention of taking the argument further.

The metaverse is being built for people. What about other organisms? They are partly also included as data points, with the activities and movements of many animals being tracked by satellites and sensors attached to them. But could the internet of animals be something more, a place where other organisms were subjects instead of

objects? What if, in the metaverse, you could understand what animals want to say or understand their experiences? This is what the interspecies internet initiative, for example, which uses information technology to communicate with animals, is trying to do. What would be a metaverse that included non-humans be like?

Food for thought: What if the brain was connected as part of a data network?

Connecting human brains to a machine is an idea familiar from many sci-fi stories. A direct link between the brain and a computer is currently under development. Gabe Newell, CEO of the Valve game studio, has stated that we are way closer to the world of the Matrix than most people realise. What if we could establish a direct connection from our brains to a data network – or to other people or animals?

Read more: [Science News / Laura Sanders 3.3.2021: Three visions of the future, inspired by neuroscience's past and present](#)
[ja IGN Nordic / Joe Skrebels 18.3.2020: Gabe Newell: 'We're Way Closer to The Matrix Than People Realise'](#)

SIGNALS

What sort of signals can you recognise in relation to the metaverse or digitisation in general and the development of technology? Here is a list of the signals underlying this chapter.

MEETINGS IN THE METAVERSE

Facebook's Horizon workrooms is a meeting room in a virtual world.

Source: Wired / Peter Rubin 19 August 2021. [Horizon Workrooms: Facebook's Metaverse Is a VR Meetaverse.](#)

ABBATARS

ABBA will return to the stage as rejuvenated virtual versions of themselves.

Source: VRScout / Bobby Carlton 3 September 2021. [ABBA Enters the Digital Realm With 3D 'ABBAtars'](#)

TRADE IN VIRTUAL ART IS HOT

The credit card company Visa purchased a digital avatar for USD 150,000 to show its support for the new trading arena.

Source: Bloomberg / Natasha Abellard 23 August 2021. [Visa Buys NFT of Digital Avatar With Mohawk for \\$150,000.](#)

VIRTUAL PLOT

As much as USD 500,000 has been paid for a four-hectare virtual plot of land in the virtual world Decentraland.

Source: Reuters / Elizabeth Howcroft 19 April 2021. [The 'metaverse' bet: crypto-rich investors snap up virtual real estate.](#)

AVATARS AS A TARGET GROUP

Clothes and appearance enhancements are marketed directly to avatars of virtual characters representing users.

Source: Forbes / Cathy Hackl 9 August 2020. [Is Direct To Avatar The Next Direct To Consumer?](#)

BUYING PIZZA IN THE VIRTUAL WORLD

In Decentraland, you can direct your avatar to a virtual pizza stand, pay in cryptocurrency and order a real pizza delivered to your door.

Source: NFT Plazas / Decentraland News, Metaverse News, Ivelina 12 March 2021. [Order Your Real World Pizza Delivery in Decentraland.](#)

FACE SWAP IN REAL TIME

With the open-source code DeepFaceLive, you can pretend to be another person in livestreams.

Source: The Byte / Tony Tran 12 September 2021. [New Deepfake Tool Turns Livestreamers Into Someone Else in Real Time.](#)

FACIAL RECOGNITION CAN TELL IF A CLASS IS BORING

In Dubai, two students created a tool that uses facial expressions to judge whether a lesson was understandable – in other words, whether students yawned or raised their eyebrows based on facial recognition.

Source: The National / Anam Rizvi 11 August 2021. [Dubai students create AI face-reading tool that tells teachers if classes are boring.](#)

ARTIFICIAL INTELLIGENCE CREATES PLEASANT FACE S

An algorithm developed by team from the universities of Helsinki and Copenhagen creates human faces that the viewer will find attractive based on brain activity measurements.

Source: SingularityHub / Vanessa Bates Ramirez 18 March 2021. [This AI Uses Your Brain Activity to Create Fake Faces It Knows You'll Find.](#)

BITCOIN'S HUGE WASTE MOUNTAIN

The cryptocurrency Bitcoin requires vast amounts of both energy and hardware. According to a study, a single payment produces as much the waste of two smartphones.

Source: Helsingin Sanomat / Simo Löytömäki 18 September 2021. [Tutkimus: Yhdestä bitcoin-maksusta syntyy saman verran elektroniikka-jätettä kuin kahdesta pois heitetystä Iphonesta.](#)

SMART PHONE ADDICTION

Small spikes of gratification brought by digital media have made many people addicted to their smart phones.

Source: The Guardian / Jamie Waters 22 August 2021. [Constant craving: how digital media turned us all into dopamine addicts.](#)

GAMING BANS IN CHINA

China has restricted minors' video gaming to three hours a week.

Source: FP / James Palmer 1 September 2021. [Why China Is Cracking Down on Video Games.](#)

BREAKING UP TECH GIANTS

The EU warns that it can require large tech firms to be broken up into smaller ones if they repeatedly break the law.

Source: Financial Times / Javier Espinoza 15 December 2020. [EU warns that it may break up Big Tech companies.](#)

BAN ON MIND READING

Chile is enacting legislation that would guarantee people's neurorights and ban unauthorised access to the human mind. Underlying this is the fear of mind reading enabled by artificial intelligence technology.

Source: Voima / Kukka-Maria Ahokas 9 September 2021. ["Ihmismieleen ei saa tunkeutua ilman suostumusta" – Chile haluaa tekoälyteknologialle eettiset rajat.](#)

RATS TOOK DOWN THE INTERNET

In Australia, cables gnawed by rats took down telephone and internet connections in a remote community for a few days.

Source: ABC News / Gary-Jon Lysaght 23 January 2021. [Five-day 3G, 4G outage in remote community caused by rodents sparks calls for tailored services.](#)

CYBERATTACK LEADS TO DEATH

A cyberattack caused a death in Germany in 2020 when the emergency room of a hospital had to be shut down and a patient needing urgent care had to be referred some distance away.

Source: Wired / William Ralston 11 November 2020. [The untold story of a cyberattack, a hospital and a dying woman.](#)

DRONE RAIN

In China, drones have fallen from the sky in quadcopter shows substituting fireworks, either due to a technical error or intentional malice.

Source: TweakTown / Anthony Garreffa 4 October 2021. [Drone light show fails in China, drones fall out of the sky.](#)

CONTROLLING PEOPLE IN THE VIRTUAL WORLD

Modifying the image shown by VR glasses gets the user to move in the desired direction without them noticing it and, for example, bump into a wall.

Source: IEEE / Peter Casey, Ibrahim Baggili & Ananya Yarramreddy 27 March 2019. [Immersive Virtual Reality Attacks and the Human Joystick.](#)

FOOLING FACIAL RECOGNITION

Several methods for fooling facial recognition have been developed, some of them working better than others.

Source: Freethink / David Zarley 14 February 2020

100 MESSAGE SOCIAL MEDIA SERVICE

A Twitter-like service called Minus only allows you to send 100 messages during your life.

Source: Minus, 2021. [Minus is a finite social network where you get 100 posts—for life.](#)

SOCIAL MEDIA DOWNTIME AFFECTED HOBBY GROUPS

A glitch in Facebook's servers caused WhatsApp to crash, interrupting communication in many hobby groups.

Source: Yle / Juha-Matti Mäntylä 5 October 2021. [Analyysi: Eilinen suuri somekatko vaikutti suomalaisten elämään enemmän kuin moni ymmärtää.](#)

FEDIVERSE

The fediverse, based on a network of independent servers, open-source code and interfaces, aims to offer an alternative to current social media and collaboration platforms.

Source: [The Federation.](#)

SQUAD WEALTH

Squad wealth emerging in online cultures is based on joint action, sharing risk and a shared culture.

Source: Other Internet / Sam Hart, Toby Shorin & Laura Lotti 19 August 2020. [Squad Wealth.](#)

INTERNET OF BEEFS

Venkatesh Rao calls the current online discussion culture the internet of beefs, where there is no intention to understand the other party, but is motivated by such things as the visibility gained by clashes of opinion.

Source: Ribbonfarm / Venkatesh Rao 16 January 2020. [The Internet of Beefs.](#)

WILD ANIMALS AS DATA POINTS

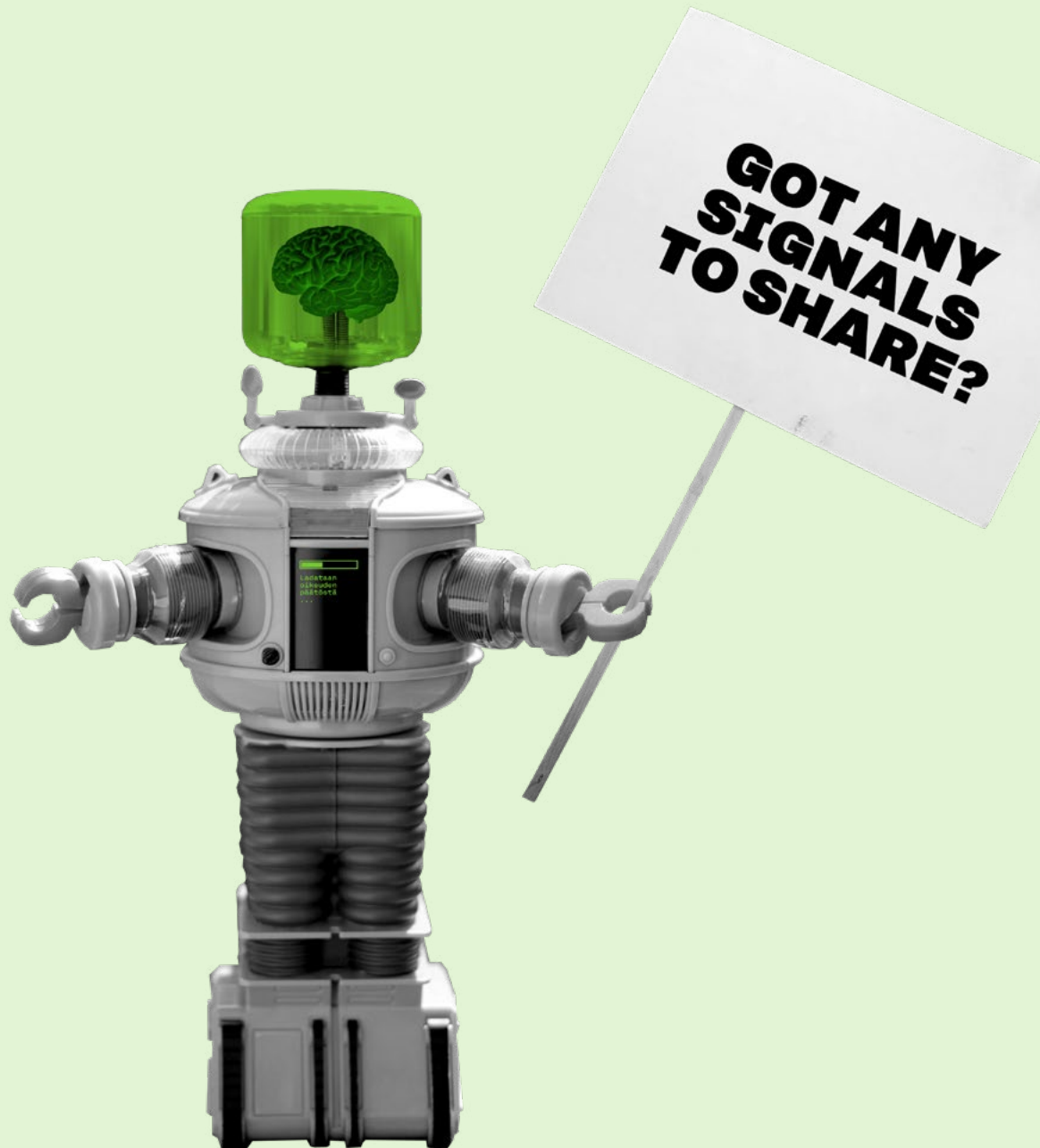
A project called Internet of Animals uses various methods to track the movement of animals.

Source: The New York Times Magazine / 12 January 2021. [How Far Does Wildlife Roam? Ask the 'Internet of Animals'](#)

INTERSPECIES INTERNET

The interspecies internet initiative uses information technology to communicate with animals.

Source: Interspecies Internet, 2021. [Interspecies Internet is a think-tank to accelerate our understanding of interspecies communication.](#)



What if nothing changes?

Thinking about the future emphasises change on the one hand while representing the future as a continuation of the status quo on the other. The message that things don't or don't need to change seems appealing, but it is never entirely true. In this study, we have particularly discussed the more surprising changes to provide a more varied view of the future and change. Change is both inevitable and necessary.

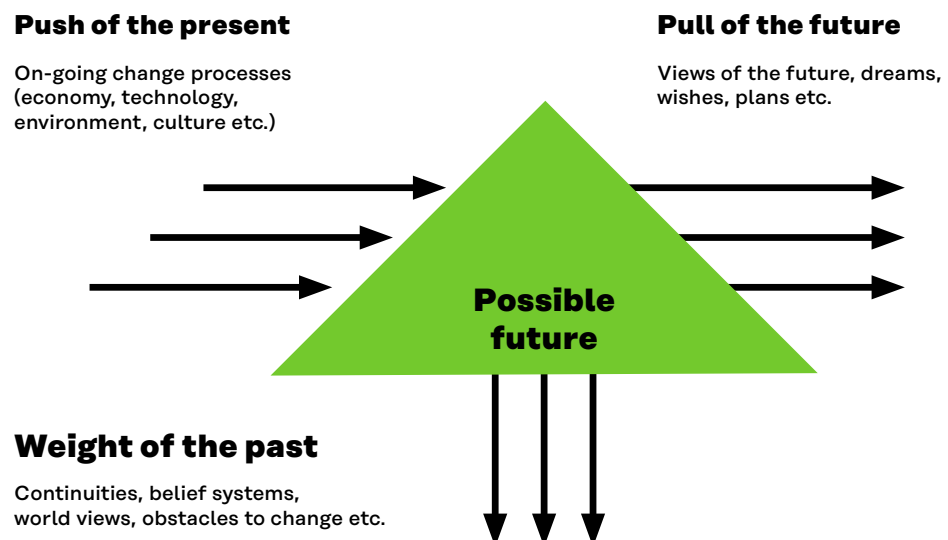
Future studies are sometimes described as the study of change. It is easier for us to imagine what already exists, so it is interesting from the point of the future to think about what things will be different. But the emphasis on change means we pay less attention to things that will not change.

We do not realise that some things are changing, some we do not want to change, and some changes are actively prevented. The futures triangle developed by futurist Sohail Inayatullah distinguishes between the

pull of the futures, the push of the present and the weight of the past (Figure 1., Inayatullah 2008). It is this weight of the past that indicates not changing, but also the steady continuation of change that is already in progress. Previous choices affect where we are now and what we can do.

Change is also actively prevented, especially change that compromises existing power structures. Futurist Alex Steffen speaks of "predatory delay" (Steffen 2021b). It means clinging onto actions that are

Figure 1. Futures triangle, adapted from Inayatullah 2008.



harmful to others, even when alternatives are available. It is not so much about inaction as it is about delay as a conscious strategy to make the most out of the current situation. The tobacco industry's actions are a historic example of predatory delay, currently particularly evident in the activities of fossil fuel-dependent industries. At the individual level, opposing change is understandable, for example, when people feel that their livelihoods are threatened.

But opposition to change is not always deliberate. It is easy to be stuck in a rut and repeat old habits when alternatives are not actively available or do not seem inspiring. Such floundering along a riverbed, as the philosopher Esa Saarinen would put it, is safe and tempting, especially in uncertain times. At the moment, it is just really important to get out of the riverbed and find other routes forward, because the riverbed is turning into increasingly perilous rapids.

No matter how hard people try to keep everything as is and prevent change, they can only influence the things within their control. The environment does not care whether we want floods, droughts, storms and heat-waves. We can close our eyes to these changes, but it will not make them go away. Futurists Ziauddin Sardar and John Sweeney, who developed the concept of postnormal times, illustrate the progress of this kind of situation as creep, lag and burst (Sardar & Sweeney 2016).

As complexity and interdependence increase, changes that challenge the 'normalcy' creep closer to experienced life. We increasingly encounter strange things. One way to react to everything strange is to ignore it and close oneself in a 'bubble of normalcy'. In this case, weak signals are ignored or interpreted as part of the old structures. Such lag in the face of creeping change eventually leads to a burst of the postnormal, which forces one to leave one's bubble of normalcy and look at the situation from a new point of view.

Lag during the postnormal times of surprises has resulted in foresight and insight experts being increasingly tasked with spouting about the present or even the past. The climate crisis, for example, is no longer a thing of the future: the climate has already changed. Humanity has never before been in this situation, in this environment, in this climate.

Or if you think about artificial intelligence, it is not a future phenomenon either. We are already seeing its effects in recommendation algorithms and the formation of social media bubbles, CCTV and facial recognition or even automated loan and insurance decisions. The author William Gibson has said that the future is already here – but it is unevenly distributed. To this summing up, we could add that we are also "not very evenly" ready for it. Or, as said in the introduction, we are not at all ready for what has already happened.

What if we don't change?

So the world around us will change, but depending on our position, we may ignore the changes and shut ourselves up in our own bubble of normalcy. What would be the result? The question "What if nothing changes?" is ultimately a question of "What if we don't change what we do?" There are no certain answers to this, but some consequences can be guessed.

What if we do not change our actions to be sustainable and respond to the environmental crisis? The impacts of the climate crisis will increase in the decades to come. If climate emissions are not rapidly reduced and eventually reach net negative emissions, the sea level will rise, droughts will desertify vast areas and parts of Earth will become uninhabitable by the end of the century. And if overconsumption of natural resources is not controlled, the problems of habitat loss, pollution and waste will worsen. The conditions for a good life for future generations will crumble.

At the same time, biodiversity loss will accelerate, and the services that nature provides, such as preventing erosion, water purification and plant pollination, will deteriorate significantly. Food production will be disrupted and across the globe, people will suffer from hunger and lack of clean water. Wealthier people will be able to sustain the bubble of normalcy longer than others, but no one will be able to turn a blind eye to the change infinitely as the crisis intensifies and there is increasing unrest. When the question “What if nothing changes?” becomes “What if we don’t change what we do?”, then ultimately we must ask: “What changes are we really prepared to make?”

What if nothing changed in Finland in terms of democratic structures? Political parties, interest groups and the media would retain a key role. Public engagement would be about voting and making citizens’ initiatives, perhaps complaining a little on social media. The present system has been in place for a long time, and the ageing of the voter base may support continuing in the old way. And why should those in power give up their power, no matter how much they talk about inclusion in their keynote speeches?

Yet this would probably result in people feeling distanced from the democratic system and in a significant loss of trust in its actors, such as the government and public authorities. In this case, the next crisis, be it a pandemic or climate-related, could collapse the entire system from within. Crisis-era guidelines would not be followed and chaos would ensue.

And what if nothing changed with regard to digitalisation and the data economy? The power of big tech giants would continue to grow and they would largely dictate what digital services are available. People’s private data would still be a commodity influencing the market – whether it concerns buying, voting or shaping worldviews. But perhaps

the most important thing is what would not be achieved, what benefits would not be realised. Data-driven services that could make life easier would not be created. Preventive health care, more efficient use of resources, many circular economy solutions – the realisation of all of these would be less certain.

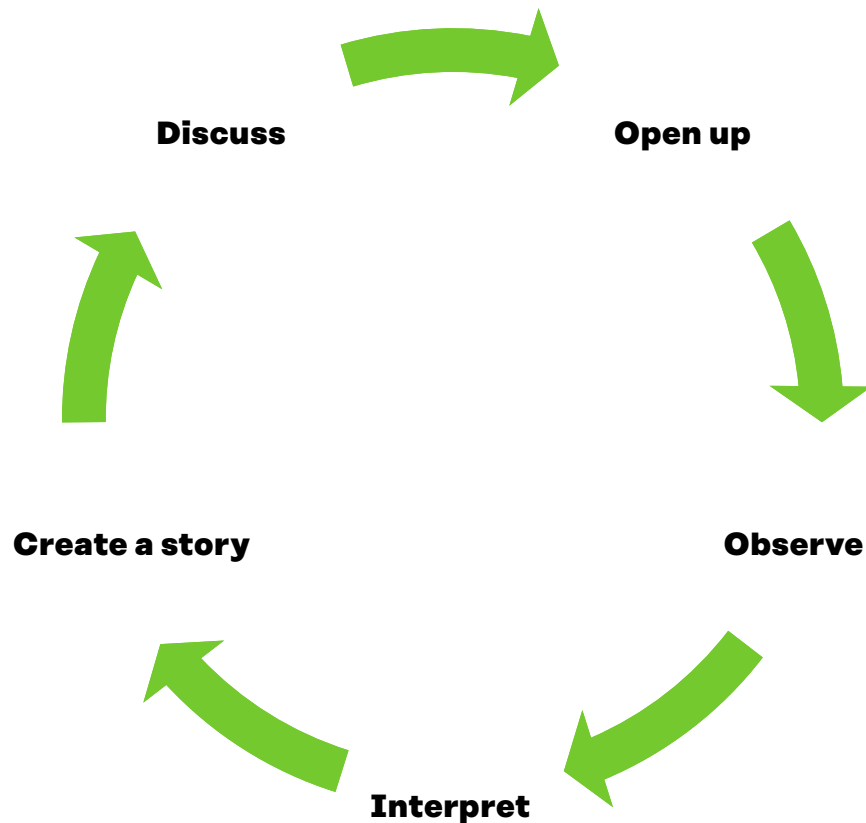
Change won't happen by itself

The preceding chapters have outlined a range of possible emerging or imminent changes. However, they will not happen by themselves or inevitably. The same is true for broader developments that people can influence. The environmental crisis, for example, is already underway and advancing, but ecological reconstruction – getting rid of fossil fuels and overconsumption of resources – depends on human action.

If you feel that nothing will change, you may be either very privileged or very discouraged. Privileged in the sense that you can afford to stay in your bubble and close your eyes to the changes taking place around you and their weak or strong signals. Discouraged in the sense that you do not believe in your own agency, in the fact that you can influence anything. Both assumptions should be challenged. The privileged bubble will burst at some point. It is possible to find your own ways of influencing, things that you want and feel you can strengthen, from emerging phenomena. Change starts with small steps.

Weak signals help us to find the seeds of change. It is up to us to think about what could grow from them and what futures they might open up – and actively make change based on our reflections. In this way, the future is more certainly to be worth living. The next chapter sheds more light on what this means in practice.

How to take control of signals



So far, we have itemised the signals that Sitra's weak signals work has encountered and interpreted to inspire your own thinking about the future. Because the value of weak signals is especially in opening up thinking, you should also look for and interpret them yourself. Here are five steps to get started.

1. Open up

Identifying and interpreting weak signals both require and support the process of broadening your thinking. Before you start to look for weak signals, you need to identify and challenge the bottlenecks in your own thinking. Futurist Joseph Voros has listed a collection of principles for scanning for signals, such as asking those who disagree,

looking for examples from outside your own domain, and focusing on the thing that doesn't fit the picture (Voros 2021).

Applying these principles, we have created a set of questions for identifying overlooked themes alone or in a group. Start by writing as many answers as possible to the following questions in ten minutes:

- **Taboos:** What is forbidden? What can't you give up? What is difficult and why?
- **New aspects of familiar things:** What are the key themes related to the topic and what is not discussed about them?
- **Elsewhere at the same time:** What is normal or emerging elsewhere that could never happen in Finland, in your neighbourhood or in your profession?

- **Divergents:** What new or surprising thing has come up that you don't actually know what it is? What doesn't fit the picture?
- **Something good:** What gives you hope?

After brainstorming, share the things that were brought up and discuss them. Can any common themes be found in them that are worth exploring? Where should we look for the signals related to these themes? The purpose of the first step is to guide the next stage of observation towards more surprising and less noticed directions.

2. Observe

Set aside enough time to look for the signals themselves. Weak signals can be found on the street, in small news items, on social media and many other places, as long as you are open to them. To find signals that are surprising, or remote from your own interpretive framework, you should look in places where you have not previously looked. It is not a good idea to look for signals alone, but to invite as mixed group of people as possible to join you.

So how can you know what to look for or whether you have found a weak signal? Futurist Elina Hiltunen suggests testing it by telling a friend about the signal (Hiltunen 2013). If the friend begins to laugh, objects to the signal or, say, firmly refuses to discuss it, it is a signal worth studying. Weak signals can be found by considering what has recently seemed surprising, ridiculous or outrageous recently.

If you do not know where to start, you can seek inspiration from the signals collected by others. Here are a few sources:

- The Tulevaisuustiedon lähteillää report (Ahvenharju et al. 2020) reviews several foresight reports and lists the trends and weak signals mentioned in them.
- The Futures Centre has a list of interesting signals of change on its website. <https://www.thefuturescentre.org/>

- Shaping Tomorrow collects signals and trends from more than 80,000 sources on a single platform. <https://www.shapingtomorrow.com/>

- The Institute for the Future's "News from the future" newsletter includes a collection of signals. <https://www.iftf.org/>

- Avenear collects signals that surprised them in a blog. <https://www.avenear.com/fringe-finds>

- Positive signals can be sought from the Reasons to be cheerful site. <https://reasonstobecheerful.world/>

You should collect signals on a shared platform in a mutually agreed form. The platform can be one that is already in use, such as a Teams discussion forum, so that people already know how to use it. It is particularly important to agree together on the format in which signals are stored on the platform. You can use the formatting of this study, for example: catchy title, brief description, source. It's essential that the format quickly makes clear what it is about (headline and description) and where to find more information about the subject (source).

3. Interpret

Once signals have been collected, it's time to interpret them. You can group together signals related to the same theme, and think about what sort of possible change they indicate or what kind of a potential future they describe. What if the thing mentioned in the signal was part of day-to-day life? How would it challenge the current situation?

You can summarise the considerations as "what if" questions and think about the consequences of a possible change. For example, signals of the Gulf Stream slowing down raise the question: what if the Gulf Stream collapsed? As a result, Finland could be a lot colder than now and current food production could collapse.

But it is not worth stopping at that, but to think about how, say, food production could

change in that situation. What would a different kind of a food production system, one that is suitable for the world, as described by the signal be like? Would we, for example, be farming crickets, mushrooms and cellular mush in underground caverns?

Finally, think if there is something in this different world or way of working that we could learn from in the present. Would we want to realise something from the food production system imagined above, even if the Gulf Stream did not collapse? We visit other futures to know how to act better in the present.

4. Create a story

Interpretation easily remains abstract, and it is difficult to take a stand on how desirable or undesirable the imagined developments would be. It is therefore good to create stories based on the interpretation and try to experience different futures through them.

For a future story, you need a signal, a “what if” question based on it and a place for the future story. The place could be, say, a café, construction site, bike ride, bathroom or grocery shop. It helps you place the reflections from the previous phase in a space and situation. For example, what would a story set on a construction site about the impacts of the collapse of the Gulf Stream be like?

You can use the following structure to help write the story:

- **First...** What is the situation? Who is there? What is the mood of the place?
- **Then what happened ...?** What is going on? What breaks the initial situation? What do those present think about it? How do you feel in the situation?
- **Finally...** How will the situation resolve or end?

5. Discuss

Future-oriented thinking is at its best when shared. Stories help us to get a sense of how different futures will feel like, what is good and what is bad about them. This way, we can also grasp what is important to us and what kind of a future we actually want.

Here are some guidelines for discussing future stories

- Read the story you created in the previous phase aloud or choose one of the stories in this report.
- Empathise and discuss: How would the characters in the story feel? Why?
- Imagine: How could the story continue? Think of different directions for the story and what emotions might be involved.
- Finally, think about what lessons we could learn from the story in the present. What would be something that could be done right away to be more prepared for the future described in the story, or to promote or prevent it?

Conclusions

Observing and interpreting weak signals and outlining different futures with it is increasingly important in our times. But it is only one part of future-oriented thinking. On Sitra's website you will find more tools and materials, such as the popular megatrend cards, comprehensive materials for organising a Futures Frequency workshop opening up future-oriented thinking and change-making, the Futuremaker's toolbox, a collection of exercises to support future-oriented thinking, and a lot more.

We encourage everyone to share the weak signals and insights they find about them on Twitter or Instagram using the hashtag #heikotsignaalit (#weaksignals). We are also happy to receive all kinds of feedback, questions and development proposals – you can send them to heikotsignaalit@sitra.fi.

Appendix: How the signal work was done

Sitra's work on weak signals originally started from a need to bring a complementary perspective to the megatrend work that had become popular. The purpose of the report, published in January 2019, was to open up future-oriented thinking, or highlight assumptions about the future, challenge views of futures and expand the range of possible futures. A set of tools was also provided to help broaden future-oriented thinking.

Recent reports on foresight and insight have emphasised weak signals and taking better account of surprises and discontinuities. The National foresight in Finland 2020 report states that "anticipating surprises, experimentation and new openings are not as high a priority in organisations" as forecasting probable developments. In fact, the report recommends "paying attention to more surprising weak signals and wild cards in addition to trends" (Pouru et al. 2020). Correspondingly, the *Tulevaisuustiedon lähteillä* (Sources of future knowledge) report recommends developing "methods, ways of working and approaches to better use abnormal phenomena, such as weak signals and wild cards, to support of policy making" (Ahvenharju et al. 2020).

The need for better attention to and use of weak signals and their use in opening up future-oriented thinking has therefore only increased since the 2019 report on weak signals. When work on this report began in January 2021, the starting point was the above-mentioned recommendations and, more broadly, the need to imagine different futures and challenge old stories about futures. Many of the topics mentioned in the previous report were still topical, but at the same time seemed too remote or separated from people's everyday life. How could we bring developments that seem strange and

surprising closer to people's experience and at the same time easier to use?

We began to search for the solution from storytelling. What could be the stories of the future that open up new horizons? Stories that would also bring the future to the present to experience? We also wanted to increase criticism of existing stories about the future. Many phenomena and perspectives can be overshadowed by storytelling and human-scale stories, and therefore a critical and analytical approach to stories is important (Mäkelä et al. 2018). Futurist Sohail Inayatullah uses the term "used future" to describe a view of the future that has been adopted from somewhere else and does not necessarily match one's own values or what one wants to happen (Inayatullah 2008).

The idea that we need different kinds of stories about futures – and challenging the current narratives – became the guiding framework for this work in early spring 2021. The more detailed design of the work aimed to find a balance between mutually conflicting objectives. How to tell human-scale stories without forgetting the big picture and context? How to acknowledge the subjectivity of interpreting weak signals while bringing out different points of view? How to combine the bizarre with the mundane? To answer these questions we must first describe the theoretical basis of the work on weak signals and how the process unfolded.

Starting points and process of the work on weak signals

The theoretical basis of Sitra's work on weak signals is research in the subject by the futurist Elina Hiltunen and futurologist Leena Ilmola-Sheppard (Hiltunen 2008, 2010, 2013, Ilmola-Sheppard 2014). As noted

in the introduction, a weak signal is something that has actually happened that can be seen as a first symptom of change or a sign of an emerging phenomenon. In practice, it may be a new technology, regulation or political measure, business model, manifestation of civil engagement, research result or invention, product or service or a new experiment. Sometimes, also an opinion can be considered a signal if it is expressed by an influential person.

Weak signals are (Hiltunen 2010, 2013)

- Novelty: a weak signal is a sign of a new thing or new aspect of an old thing
- Surprising: a weak signal is surprising to its interpreter
- Challenging: a weak signal forces us to challenge our assumptions of the present, which is why it is often difficult to detect and easy to overlook
- Relevant: a weak signal describes a thing that can have an impact in the future
- Delayed: a weak signal indicates a thing that is not yet significant but needs time to mature

These properties make clear that a weak signal is always open to interpretation. What is surprising or new? And what is considered significant? The interpreter's point of view, context and paradigm strongly influence this. Both the observation and interpretation of weak signals require challenging one's own paradigms (Ilmola-Sheppard 2014). In terms of observation, this means looking for signals in new places and in new ways. In practice, this can be going through journals and reports outside one's own field of expertise, following the social media posts of futurists and dissidents or looking for surprising things while shopping, for example.

Once you have collected a sufficient number of signals, you can set out to interpret them. The first interpretation is easy and often a bit boring. It is therefore worth giving the same signal several different interpretations, thinking about it from different points of view and discussing it with others. Inter-

preting signals is about thinking about their direct as well as indirect effects. If you had infinite time, you could both collect signals broadly and make plenty of interpretations of them. In practice, though, it is necessary to strike a balance between the scope of observing, depth of interpretation and time available.

For a weak signal to turn into action, it must pass through several phases. These can be described as "filters" (Figure 2., Ilmola-Sheppard 2014, Ansoff 1984). There is an enormous number of possible signals. The observation filter determines which signals we notice. The wider the filter, the more signals associated with the more themes we notice – and the more laborious the detection. Once a signal has been detected, it is interpreted. This is influenced by the interpretation filter: point of view, paradigms, values and interests.

An interpretation based on a signal does not, however, directly lead to action. The power filter determines which interpretations are considered and on what basis they are acted on. This is directly linked to future power: who has the power to determine the views of futures in the public debate and who is reflected in these futures. The power filter determines what is to be highlighted, what is to be silenced, what is considered relevant, and what is considered useful. As such it influences how signals are used.

The power filter can be broadened by expanding the discussion of the future and making different future development paths, potential surprises and visions of the future easier to embrace. Sitra's work on weak signals has aimed to broaden the observation filter, the interpretation filter and the power filter. Next, we will describe this process through its three phases: collecting signals, interpreting them and wrapping up the work.

Collecting signals

Signals collection started in early spring 2021. The authors of the report had the main

Figure 2. Filters influencing the interpretation of a signal and acting on it. Adapted from Ilmola-Sheppard 2014 and Ansoff 1984.



responsibility for collecting signals, but all Sitra employees were invited to participate. A separate Teams channel was established for this purpose, where signals could also be discussed together.

The idea of crowdsourcing signal collection was considered in spring 2021. The plans included an open questionnaire asking for descriptions of something surprising encountered recently. But after a few test versions, the plan was abandoned because the question was considered to be too difficult. Observing signals requires the kind of background explanation and challenging of current assumptions of the future that a survey could not provide.

Instead, we decided to focus on challenging our paradigms and assumptions. Sitra organised three internal “sense-breaking” workshops to identify blind spots in observation. While sense-making is about creating a shared understanding of something, sense-breaking is about breaking down the prevailing perceptions and challenging assumptions (Maitlis & Christiason 2014). The workshops used the principles of futurist Joseph Voros converted into questions for signal detection (Voros 2021). The “Open up” exercise described in the report was created based on the workshops.

Signals were collected from social media, blogs and the news. In addition to these, also existing collections of signals were used. These included

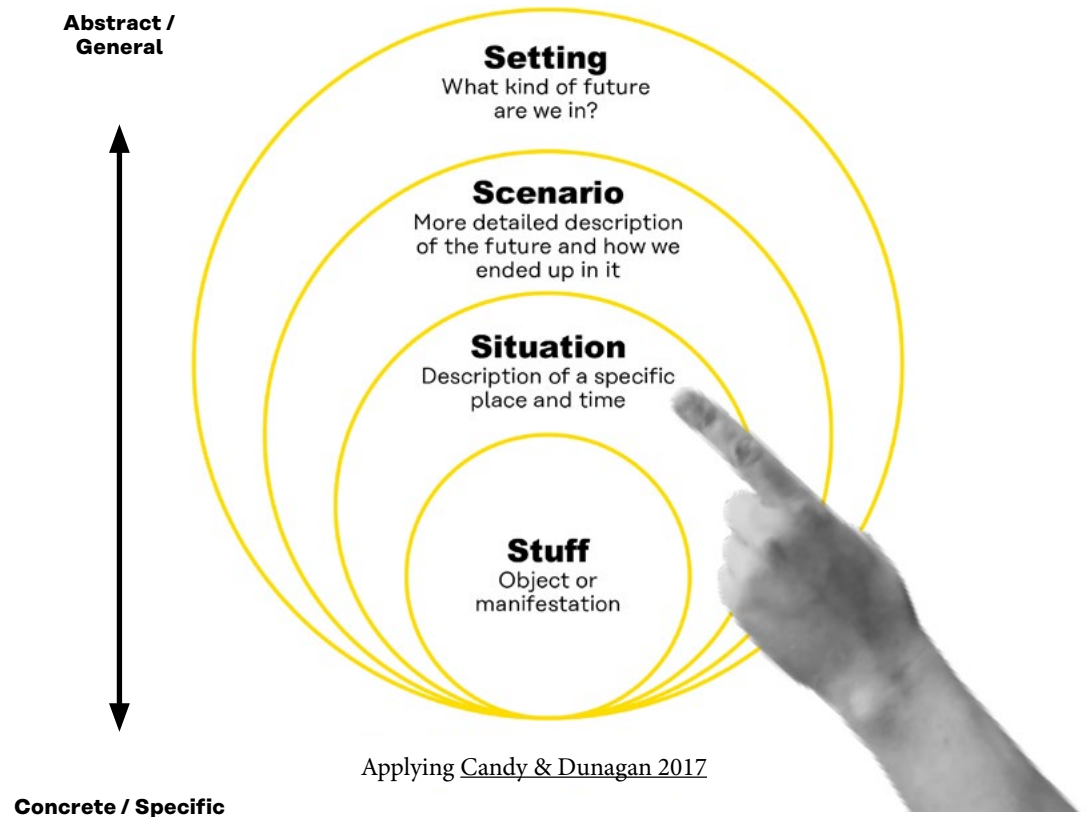
— [The Futures Centre: Signals & Insights](#)

- [Institute for the Future: News from the future](#)
- [Avenear: Fringe Finds](#)
- [Reasons to be cheerful](#)
- [Scenario Magazine](#)
- [VORAUSSchau: Wild cards – preparing for the unexpected](#)

Interpretation of signals

The signals’ interpretation work mainly took place in September–October 2021, guided by Sitra’s vision of a fair, sustainable and inspiring future. In the interpretation we considered what the thing indicated by the signal could mean if it became more common and what consequences it would have for Finnish society. Alongside a general description of the general effects, we wanted to consider how they would be manifest in people’s daily lives. For this, we used the methods and frameworks of experiencing futures.

The futurists Stuart Candy and Jake Dunagan define four different levels of review for experiential futures (Figure 3., Candy & Dunagan 2017). The most abstract level describes the world of the future on a very general level. The more detailed descriptions are scenarios that involve a description of how we ended up in that future setting. Closer to the concrete are descriptions of situations that will occur in a specific place and time. The most concrete level involves various objects or other experienced manifestations of the future.

Figure 3. Levels of experiencing futures Adapted from Candy & Dunagan 2017.

The interpretation was first based on different situations, such as eating, travel, working or shopping for groceries. In terms of collaborative story-telling, however, we found it clearer to start from a place instead of a situation. The future is always experienced in a place, and places provide access to a wide variety of situations.

In order to interpret the signals, two internal Sitra workshops and two open workshops were held in September–October. At the September workshop, teams of about four people wrote a story of a given signal taking place in a specific location. The groups were given a brief description of the signal, a link to the original source and three alternative locations to choose from. The locations included a day-care centre, construction site, hospital, clothing shop, bike ride, car, park and restaurant. The aim was to

provide locations that everyone knew that were as diverse as possible.

The participants considered collaborative story-telling to be a good way to grasp the potential impacts of the signal. Because reflections on the future easily focus on threats or undesirable developments, the workshop was also instructed to consider what good things could happen. In fact, several groups reported that after initial dystopian reflections, they also found good aspects to their imagined story. The stories created by the groups therefore were not about unambiguously desirable or undesirable futures, but more complex, as life tends to be.

The stories created by the stories were edited into clear narratives and used in the October workshops. This time, the task was to empathise with the story and think about

it from the point of view of its characters. Several different possible follow-up stories were also made. The aim was to provide several perspectives to the same story. The participants commented that the different points of view also clarified their own assumptions about the theme of the story. Experiencing the stories also made them think how the future described by the story was reached.

Wrapping up

The writing of the study began after the workshop process. The six locations mentioned in the report were chosen based on the workshops and the grouping of the signals collected. The aim was to gain as comprehensive an overview as possible of the weak signals relevant to Finnish society, while at the same time keeping the report a readable length. More locations were identified than could be reviewed, and a few interesting ones, such as a health centre or school, had to be omitted from this report.

The locations provide structure for the entire report. The four futures framework of futurist Jim Dator were used in grouping the signals associated with a specific location and structuring the chapter (Dator 2009). After going through a large group of scenarios and future reports with his research team, he noticed that they belong to one of four categories: Continuous Growth, Limits & Discipline, Decline & Collapse, and Transformation, or radical change.

Because the framework was originally created for classifying future perspectives and scenarios, it had to be adapted to be suitable for classifying signals. After editing and testing, the following classification guided the structuring:

- Continuous growth: signals associated with the current development and its new aspects.
- Limits & Discipline: signals that are about reactions to current changes and attempts to manage them.

- Decline & Collapse: signals that significantly challenge current structures and the definition of the location.
- Transformation: signals of something completely different.

The classification helped to acknowledge diverse signals in a sufficiently comprehensive way. Because the aim is to outline different kinds of stories about the future and challenge existing ones, we wanted to gain different perspectives on location-related signals and the futures they could be about. The classification takes into account both the continuum of the present and responding to it and collapse or significant change. What is considered to be a collapse, for example, is naturally also open to interpretation, and the classification can be seen mainly as to be primarily a guiding tool and as one of the keys to the assumptions made. Other choices and classifications would have been possible too.

The report is intended to stimulate thinking about other futures. This is why the subheadings of the chapters are questions. “What if” is a basic question triggered by weak signals, opening the door to other futures. The stories about the future at the beginning of sub-chapters aim to offer a glimpse of what might lie behind the door. The stories are completely fictional and draw on the stories created and discussed in the autumn 2021 workshops. However, the stories of the workshops did not end up in the report as such, but served as inspiration for the final stories.

Signals tied to familiar places are closer to day-to-day life, but at the same time they are not necessarily completely surprising. Therefore, one question that is more surprising was added to the end of each chapter for reflection. These are based on interesting things encountered when collecting the signals, but are based more on thinking games than actual events.

The report aims to encourage all readers to collect and interpret weak signals and debate other futures. A simple process for

getting started has been outlined in the last chapter to support this. The process is based on the lessons learned from Sitra's work on weak signals, and it is a follow-up version of the workshops carried out in the course of this work.

Summary

The above describes how the work progressed and what solutions were made during it. It was stated at the beginning of this appendix that we had to strike a balance between several mutually conflicting objectives. Let us return to these initial questions and how we tried to address them:

- **How to tell human-scale stories without forgetting the bigger picture and context?** Each sub-chapter begins with a short story, followed by a more general description of the futures that the signals can tell and the trajectories to which they relate. The chapters also begin with a description

of the changes, tensions and issues currently associated with the location and topic.

- **How to acknowledge the subjectivity of interpreting weak signals while introducing different perspectives?** We cannot get rid of the subjectivity of interpretation but we can try to be as open as possible about the choices made. Therefore this appendix describes the process behind the report in more detail. Several perspectives have been introduced, especially during the workshop process. Diversity was also sought by structuring the chapters using Dator's classification and by crowdsourcing the collection of signals to all Sitra employees.
- **How to combine strangeness and mundaneness?** The potential impacts of the signals are reported through familiar locations. The narrative, on the other hand, enables the perception of more surprising developments.

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About the authors

Mikko Dufva is Sitra's future expert and docent of future studies at Aalto University. His work focuses on future trends, the tensions between these trends and images of the future. He also seeks to identify non-obvious but important issues for the future. Mikko has extensive experience in foresight and is a Doctor of Science (Technology) in the field of futures knowledge generation and systemic foresight.

Christopher Rowley is a foresight specialist at Sitra. He develops Sitra's future-oriented work and reviews long-term societal change phenomena. Currently, he is working particularly on the future of the economy, technology and security. Christopher is particularly interested in the impact, diversity and inclusiveness of foresight.

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PO Box 160, FI-00181
Helsinki, Finland Tel.

+358 294 618 991

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