AMBIENT TECHNOLOGY

Sensemaking Insights and Emergent Futures

By **Superflux**

ACKNOWLEDGEMENTS

ABOUT

Superflux is a critically acclaimed foresight, design and innovation company based in London, UK. We create tangible future worlds where people can directly encounter the possible future consequences of their present day choices. For over a decade, we have worked with governments, corporates and cultural organisations to consult, educate, design and build experiential installations of multiple future visions.

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OMIDYAR NETWORK

CHAPTER 1: PROJECT OVERVIEW

1.1 PROJECT PREMISE AND AMBITION

Smart devices and sensors; smart homes, IoT and Industrial IoT; 5G; smart cities; expanding facial recognition and satellite imagery – a new layer of ambient technology is rapidly occupying the world around us, not always visible to, or questioned by, users and consumers. With the capacity for ambient data collection and algorithmic decision-making, such opaque and invisible technology is already creating new experiences only few can imagine.

Omidyar Network and Superflux are working together to create bold, imaginative, tangible future visions for who such ambient technologies affect and how, what values they promote, and what they make possible. Superflux believes it is important that the visions we author, co-produce or fund are plural, diverse and inclusive. Everyone from influential decision makers (such as politicians, policy makers and corporate leaders) to members of the public who may not typically have a voice in decisions about emerging technologies (such as students, elderly people, teachers, nurses, and minority groups excluded from decision-making) must have the opportunity not only to be heard, but to have a voice and a role in building future iterations of such technologies.

We deserve more agency than simply opting in or out. It is only by engaging with imaginative, visceral, future visions for technologies that are otherwise invisible, and out of sight by design and intent, that people will be able to understand their potential as well as their unintended consequences. Superflux's intention is that the knowledge acquired from engagement across public and private sectors will seed the direction for product development, investment, business strategies, policy and legislation formation, and legal regulation, as well as encourage wider public debate.

In this project, Superflux will explore how to catalyse people's imaginations and create tools that can assist in removing barriers that prevent individuals and communities from shaping and implementing ambient technologies. This work will deliver rich, thick, experiential visions of futures that aim to provoke new thinking around the ways in which such technologies might influence our lives. And it will seek to inspire action: action in the form of better legislation, policy, funding, and technological product development, to ensure that these next generations of ambient technology do not continue to play a role in surveillance capitalism.

1.2 AMBIENT TECHNOLOGY

Ambient technology refers to the extension of technology into the fabric of everyday life — and its disappearance as an identifiably separate and discrete factor. It builds on the term 'ambient intelligence', an emerging field adjacent to the 'Internet of Things' that aims to bring technological 'intelligence' to our everyday environments, and make those environments sensitive to human presence, behaviour and interactions. This coming seamlessness of technology's embeddedness in our lives raises critical questions of consent, agency, governance, power and surveillance — which this report aims to identify and analyse as the basis for the development of futures scenarios.

PROJECT OVERVIEW

1.3 ABOUT THIS REPORT

This report reflects the findings of our research and sensemaking processes, with details of our method provided in Chapters 2 and 3.

The insights shared in Chapters 4 to 9 provide the conceptual framework in which we have built the scenario pathways outlined in Chapter 10. They provide a map of the world as it is today, plus emerging trends and future possibilities that will guide and shape the development of ambient technologies in the years to come. We share them here in order to give insight into our process and build a common understanding of the grounds from which the scenarios extrapolate. We group these insights into six chapters:

- Bodies
- Memetics
- Tools
- Infrastructure
- Governance
- Planetary

These chapters are ordered by scale – starting from the familiar human scale of day-to-day embodied experience, then building out through collective fragmentations, the socio-technical systems of tools and infrastructure, to the national and international scale of governance, and then, finally, the planetary. Using scale as a framework enables us to ensure our insights address the full scope of possibilities for ambient technologies and the full range of ways they will impact people's lives, our societies, and our world.
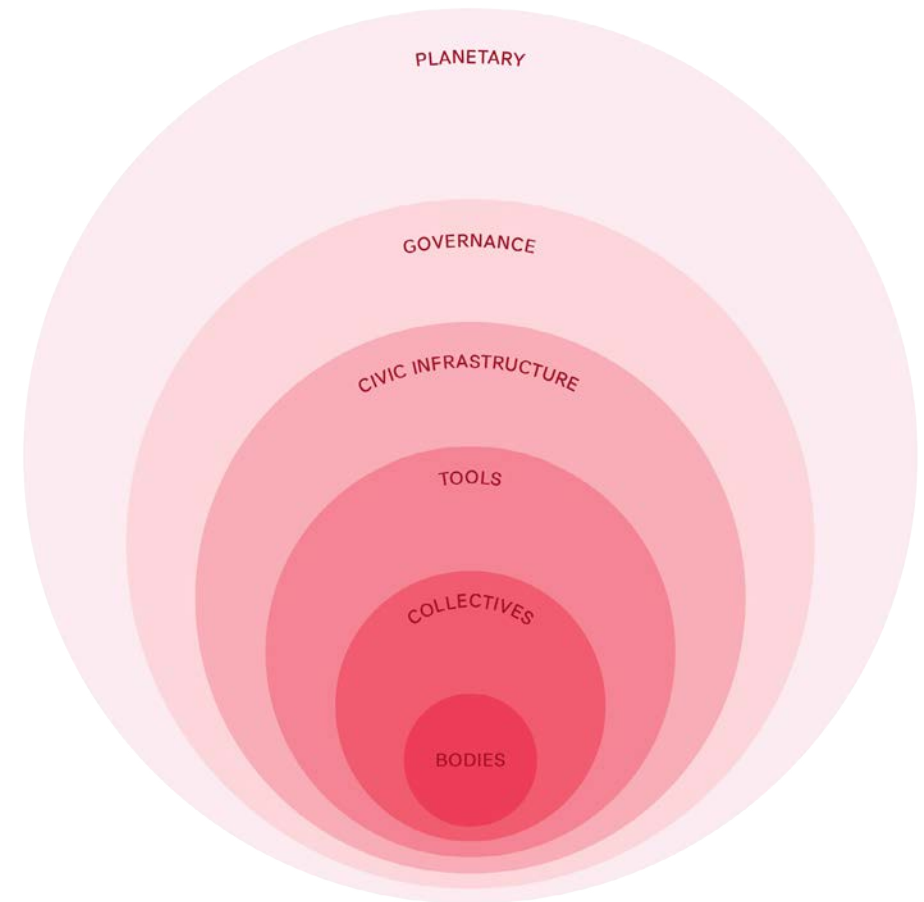
Scales of analysis and interpretation

Within each chapter, the insights are organised into three stages:

- Current Landscape, showing themes at play today
- Emergent Directions, showing developing themes
- Future Extrapolation, anticipating how these themes may expand and extend in years to come

CHAPTER 2: RESEARCH APPROACH

Superflux embarked on parallel research activities to gather a carefully curated range of diverse voices and perspectives, using ethnographic and foresight research techniques.

APPROACH 1: ETHNOGRAPHIC RESEARCH

A 4-week intensive period of ethnographic research to learn about people's hopes and fears regarding technologies, especially those who are often excluded from their development. Eleven participants were interviewed, representing communities often under-represented in technology, from those living in low socioeconomic areas to migrants and refugees.

As the ethnographic research was conducted at the same time as COVID-19 spread across Europe and the US, leading to state implemented lockdowns, the methodology was adapted to this new context. The ethnographers worked with available digital channels, conducting video call conversations and encouraging the use of mobile diaries and text-based digital communication. This was supported by conversations on forums and social media, perspectives from stakeholders that work closely with relevant communities and groups, and desk research.

APPROACH 2: FORESIGHT RESEARCH

Running in parallel to the ethnographic research, Superflux also conducted a foresight study with a specific focus on the impact of emerging ambient technologies on communities that have been alienated from mainstream societies. This was accompanied by expert interviews. The study then was followed by a broader horizon scan activity, scouring through texts, podcasts, interviews, news, media and academic research, looking for weak signals, fringe ideas, and continually emergent trends, which were mapped across individual, collective, infrastructure, governance and planetary lenses.

The following experts were identified to be interviewed based on their expertise in understanding emerging technologies and their potential. They represent fields including government, public sector, culture, business, the civic sector and academia, in order to gain a range of perspectives.

- Dragana Kaurin on AI and Refugee Rights from the Berkman Klein Centre
- Andrew Zolli from Planet Labs, San Francisco
- David Sangokoya on the 4th Industrial Revolution and Civil Society from the World Economic Forum
- Shannon Mattern, educator and scholar at Parsons New School
- Rachel Coldicutt, technology researcher and founder of Careful Industries
- Anasuya Sengupta on Decolonising the Internet
- Tim Maughan, science fiction author
- Madeleine Elish, Program Director at Data & Society

RESEARCH APPROACH

The ideas they shared are included throughout the report as quotes, so we represent multiple and varied viewpoints.

KEY INSIGHTS FROM THE ETHNOGRAPHIC RESEARCH

Reflecting on carrying out research during the COVID-19 pandemic, the ethnographers noted how this crisis has highlighted and exacerbated existing issues, such as inequalities in healthcare access and religious divides. The new choices, behaviours and public discourse brought about by the pandemic provoke questions for how society will respond to ambient technologies:

- The use of technologies in tracking and surveillance of the pandemic raised the prospect: Is there a rise in acceptance of digital surveillance? What liberties are we willing to negotiate in order to go back to 'normality'?
- Fake news and hate speech online have been fuelling divisive rhetorics. There appears to be an increase in 'us versus them' messaging, and decreasing space for nuanced conversations. Nuance helps us see and consider different angles of arguments and stories – but will there be space for nuance in the future of ambient technologies?

Headline findings from this research:

- Despite feeling that there is a great unknown when it comes to technological development, there was an optimistic view of technological progress and a fascination with novelty amongst our research participants.

- Current technologies feel chaotic and unregulated to our research participants. Yet, despite concerns around privacy and lack of trust in platforms and their content, none of them wanted to be alienated by technological developments, as technology is being marketed as vital for being a part of society.
- The COVID-19 pandemic is accelerating the adoption of ambient technologies, such as voice activated assistants, highlighting the positive impact such technologies can have for activities such as providing care to the elderly.
- The participants expressed that they wanted a lower cognitive load when using technology, and ambient devices are perceived as healthier alternatives. Voice activated interfaces create experiences that lead to more 'natural' interactions, causing less concern for security and privacy.
- However, the ethnographers noted that there was a clear gap between privacy literature and end users.
- For some, distrust towards others, and authorities, have pushed them to take matters in their own hands, such as increasing surveillance in and around their homes. The implications of these activities on wider society are often an afterthought – but shouldn't be.
- Regardless of their awareness levels around ambient technology, our participants didn't want their future run by other people. They expressed fears about a lack of intentionality and accountability, issues exacerbated by the invisible nature of ambient technologies.

Details of the ethnographic research method, and the emerging insights can be found in the Appendix.

RESEARCH APPROACH

Workshop tasks and results from thematic development

SENSEMAKING STAGE 1: WORKSHOP

The process of sensemaking was critical to this project's journey, enabling Superflux to surface unexpected connections and interdependencies, and question earlier biases and assumptions. It gave the researchers, designers and Omidyar Network teams an opportunity to explore the research insights from the parallel research tracks of ethnography and foresight, followed by an organised collective reflection on the sum of the parts.

The first stage of the sensemaking process was a collaborative workshop with the Superflux and Omidyar Network teams. Through a series of exercises, the workshop participants reflected on the research through different lenses; revealing how biases and assumptions can shape the way we view ambient technologies.

Insights from this process were then used to consider the directions different technologies are taking, and how these developments could positively and negatively affect different communities.

During the workshop, it was clear that the effects of the current COVID-19 pandemic were disrupting the way that the participants consider ambient technology futures: the group's understanding of ambient technology is changing as so many people are spending their time virtually or digitally, and what were previously just 'risks' are now manifesting as 'harms'. This is highlighting to many how much bias they have in their understanding of what the tech 'world' is.

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CHAPTER 3: CRITICAL SENSEMAKING

EMERGENT THEMES

- **The 'harms' and 'benefits' of technologies:** The current pandemic has added to a general feeling amongst the workshop participants that we're at a point where critical choices must, and are, being made in relation to ambient technologies. To us, it was obvious to see the risks inherent in the use of technology, but it is hard to quantify these as tangible harms being done to people who are currently feeling the benefits.

- **Emotional labour links to privacy:** In focusing on the contrasts between the responses of ethnographic research participants Racquel and Leila, we discussed the value people place on their digital privacy, and how this is sometimes less important than other demands, such as the difficulty of parenting. Will this privacy always be overshadowed by another demand during that user's life?

- **Disillusionment:** We reflected that it felt like the people in the research are sometimes responding to a lack of trust created by technology by using more technology. Agency is powerful, but if the system you're in doesn't give you a platform it can be frustrating.

- **Importance of community:** We are a social species, so how does tech mediate our social circles/communities? Encouraging community and the local within the tech world was a theme the teams kept coming back to. A key example of this that we could build on is digital mutual aid infrastructure.

- **Business Models:** A key area of discussion was around the importance of linking the technology to the business models that create it. How do we decouple business opportunities (making money) from technological output? We felt this project offers the opportunity to rethink business models behind technological futures. What if we were able to create something to rival the current platforms? Could this be bottom up like the mutual aid communities?
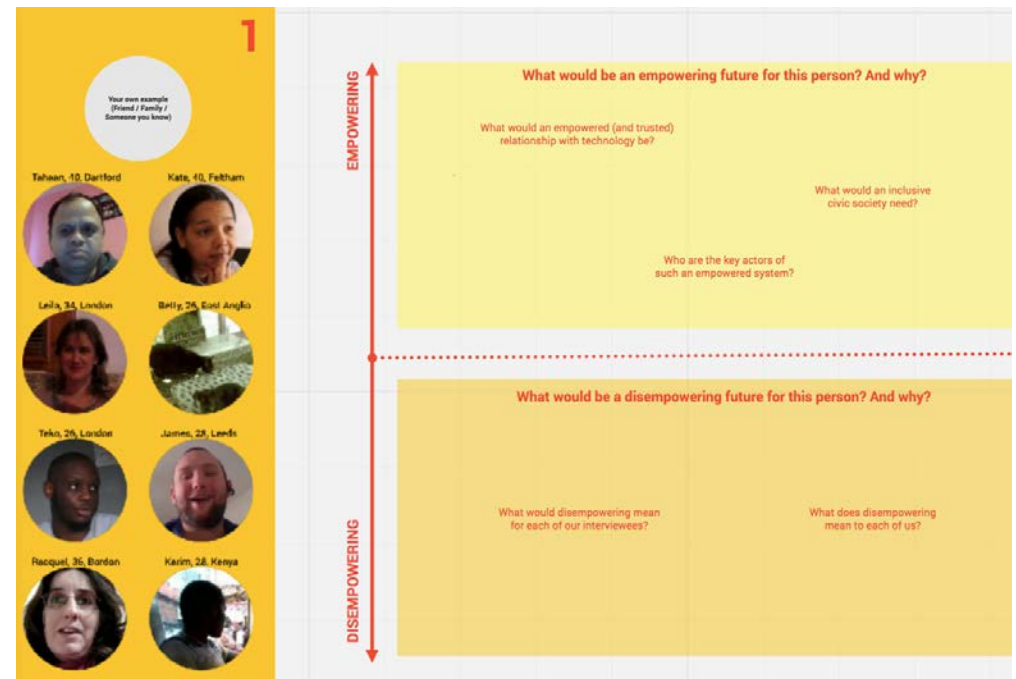
Workshop tasks and results from thematic development

CRITICAL SENSEMAKING

Mapping the findings from the sensemaking

SENSEMAKING STAGE 2: MAPPING

Drawing insights from the sensemaking workshop, and observing the rapid change in events around the world, Superflux continued the sensemaking process, taking a critical perspective on the insights explored thus far, and casting a wider net on the current forces at play.

Superflux charted threads of nested trends and signals relationally connecting us (people, humans) to the mapped landscape through the lenses of bodies, collectives, tools, infrastructure, governance and the planet.

All of a sudden, what were a number of disconnected themes around, for example, personal health and civic infrastructure are now recognized as closely interdependent, and the forces that affect these trajectories will have a deep impact on Omidyar Network's decision-making, e.g. fostering civic engagement.

This map can never encompass the sheer scale and speed of change around us, but its intent is to show how a continuous critical sensemaking activity is essential for design and investment in technology programs and projects. The worlds we cohabit are constantly changing in unpredictable ways due to numerous, interdependent factors – such that neither statistics nor precedents from the past can wholly anticipate the full scope of potential options in the future.

CRITICAL SENSEMAKING

CURRENT LANDSCAPE

EMERGENT DIRECTIONS

FUTURE EXTRAPOLATIONS

CRITICAL SENSEMAKING

The next six sections share in depth the insights developed through the research and critical sensemaking, providing the platform on which we have developed the Scenario Pathways in Chapter 10.

These sections are written from a collective perspective, and therefore addressed as 'we', 'us', 'our'. This is done to keep a consistent flow in addressing and talking about people, though we fully recognise that in no way can any such report bring the perspectives of all people.

Colour code:
Red: Expert quotes
Blue: Ethnographic insight

CHAPTER 4: BODIES

In this section we draw a thread from the seemingly naive use of technological tools used by individuals to track and monitor their health and wellbeing, to the rise of platforms supporting health surveillance and the biopolitics of sovereignty.

The diagram contains the following labels (from outer to inner):

Equal Internet, Digital Colonialism, Abdicated Decision Making, Retrofitting Existing, Civic Integrity, Rise of the Vectoral Class, Technological Terraforming, Commodified Bodies, Private Surveillance, Imperial Formations, Techno Chauvinism, Retrofit Humans, Corporate Inade..., Antibody Power, Bio-Politics, Data Doubles, Age of the Creator, Attention Economy, Bodies In-The-Loop, Ambient Biometrics, Personally Predictive Insurance, Quantified Self, Data Exhaust, Technology (Ambient, Automated, Algorithmic), Health Borders, Governing Surveillance, Body Surveillance, Context Collapse, Viral Conspiracies, Post Truth, Othering, TikTok Cults (Fan Power), Pillarised Communities, Divergent Social M..., Growing Inequality

QUANTIFIED SELF

The term 'quantified self' was coined in 2007 by WIRED journalists Gary Isaacs and Kevin Kelly discussing the implications of then-new tools that were making self-tracking easier. The decade since has seen a proliferation of gadgets and apps tracking and keeping account of what seems like nearly every function of our bodies — from Nike Training Club, Strava and Google Fit to track your workouts; MyFitnessPal and Noom to monitor your nutrition; Waterlogged and Hydro Coach to log your water intake; Balance, Headspace and Calm to record your meditation and mindfulness achievements, and Fitbit and Apple Health to keep tabs on your activity, heart rate and sleep quality. What started out as a niche interest of a community of makers and aficionados quantifying wellbeing has now become accessible to all mobile users.

Over the last decade, what began as a wholly manual, deliberative process of self-monitoring has become increasingly automated and ambient. Bluetooth-enabled scales share your weight measurements directly with your mobile apps; Apple's Health App monitors your step count by default. Many believe that AI and algorithms are more objective than humans, and subscribe to a truth in numbers when practicing different forms of self-surveillance. These technologies claim to enable a closer understanding of our bodies' needs, but we must also consider ways in which they may be distancing us from our own perceptions.

Natalie Jeremijenko calls this a form of 'data spectatorship', where we become spectators of the data generated from such quantified interfaces, without paying attention to where that data is stored, how it might be used and what its consequences could be on our lives.

DATA EXHAUST

It is as if we are leaking data everywhere. 'Data exhaust' refers to the 'information byproducts' of our mobile, digital and online activities; a trail of information that a user leaves in their wake, often not intentionally. Data scientists use this data to analyse user behaviour and create predictive analytics, but this may be used in ways that we cannot foresee, or which may be beyond our understanding.

People are to an extent aware that they are leaking data, but many believe it to be beyond their control:

> *"With everything, if you want to use it, you have to sign up, you have to enter your details." —* **Tahaan**

> *"I think as soon as you put any data on a device, it's accessible. You got to accept it." —* **James**

> *"The fatigue of information security; I'm losing the battle, I used to be better, but I now leak data everywhere. There are countries I will never travel to because of my digital footprint." —* **Leila**

DATA DOUBLES

With many platforms and services being free to use, their structure and design are often shaped by the need to maximise the monetary value of the data being generated by users, in order to resell it for advertising targeting. Their collection of data creates a form of ID – a 'data double' (a term coined in Kevin D. Haggerty and Richard V. Ericson''s 2000 article, 'The Surveillant Assemblage') – though what is collected, and how we are defined, depends

on the motives and priorities of those collecting the data, not the data subject (the user) themselves.

"I simply refuse to sign up to Facebook because I don't want to be packaged up into a product they sell. I do read a lot on Twitter, though, because you don't need to create an account." **— Richard**

PERSONALLY PREDICTIVE INSURANCE

Insurance has always been in the business of predicting the future in order to mitigate its risks. The rise of quantified self tracking and AI-enabled predictive analytics has consequently been of great interest to this sector. Recently, through quantifying our wellbeing and health data, tech companies have been stepping into the life and health insurance market. There have already been tensions about whether life insurance companies should be able to access results of at-home genealogical DNA tests, such as 23andMe. Now, in Australia, Qantas' Health Insurance programme is linked to a wellbeing app that prompts you to take part in health challenges measured by smart trackers, such as FitBits or smartphones, which can lead to rewards through gamified incentives such as personal achievements and health challenges.

This is a trend not just being seen in the US or Europe. In China, Tencent and Alibaba are transforming healthcare provision, mostly by using AI-powered services to offer new forms of health insurance. For example, Tencent offers a medical insurance called WeSure, which offers money back based on WeChat users' step count data.

Amazon Health is rapidly advancing in the field, with ambient technologies such as Amazon's Alexa becoming compliant with US legislation that would allow them to transmit and receive protected health information. In the UK, access to big data from the NHS could grant vast statistical and even decision-making powers to Amazon's algorithms.

In some countries (such as Germany) or for some social groups (e.g. migrants in the UK or in France), health insurance is a legal requirement. With 'quantified self' data being used to define wellness and insurability, there are risks it may come to define inclusion and access to society and/or the state.

BIOPOLITICS

The COVID-19 pandemic has put our bodies and movements under intensive scrutiny, and the technological intrusion of quantified health and wellness has become ever more profound.

'Biopolitics' is a term referring to a governance that focuses on the administration of life and a locality's populations as its subject. The philosopher Michel Foucault, who developed the term, describes it as the attempt "to ensure, sustain, and multiply life, to put this life in order."

As Matthew G. Hannah, Jan Simon Hutta and Christoph Schemann write regarding COVID-19, "seen through a Foucauldian lens, the current situation is clearly one example of a constellation in which elements of sovereignty, discipline, biopower and biopolitics, and governmentality are combined in uneven – as well as geographically situated and rapidly shifting – ways." They argue that locking down movements of human bodies could not lock down the movement of essential goods and services, and that foregrounds "a tension within the basic biopolitical logic of the cultivation of human life: to 'make live' rather than 'let die.'" It may be seen as necessary to make the specific form of life temporarily less healthy or fulfilling for some groups. "Being 'made to live' at the price of quality of life is perhaps most poignantly illustrated by the situation of many elderly and infirm people housed in institutions now forbidding visits by family and friends," Hannah et al. note.

The use of 'biopolitics' as a lens draws our attention to how the entities that we deem 'natural' and/or inevitable (who lives, and who dies; the health of our bodies meanwhile) are in fact political questions and at the heart of the function of the state.

AMBIENT BIOMETRICS

The value of our personal health data has become increasingly clear during the COVID-19 pandemic. The uptake of health surveillance systems at the

behest of governments and states shows how our biological and technological existence are now increasingly locked in as our bodies are mined for data, which is collected and politicised in the name of national security and public health. During the COVID-19 pandemic, we are seeing surveillance technologies being deployed to secure the population's health and wellbeing – from pandemic drones to the use of biometrics and thermal imaging technology being marketed as a way to create a more robust security infrastructure for corporate facilities.

Location data is sufficiently granular that it can grant governments the ability to place people under intrusive but invisible surveillance. There is also a rise in biometric measurements, such as continuous temperature monitoring, which is currently being used by Emirates Airlines coupled with legal requirements for data sharing and reporting to health authorities.

"You have no physical agency, no agency over your own body – therefore no agency over your digital body – how it is being monitored, surveilled."
— Dragana Kaurin, Berkman Klein Centre

The current state of personal health data tracking forces us to consider whether it could become a requirement for us to broadcast, monitor and transmit, not just our location at all times, but identify those with whom we socialise, work and come in contact.

BODY SURVEILLANCE

Countries that are performing well in managing the COVID-19 pandemic have made effective use of contact tracing. Asian countries have gone the farthest in their contact tracing efforts, building on systems and tools developed in the aftermath of SARS and (in the case of South Korea) MERS. Contact tracing relies on a combination of empirical detective work and digital tools to track

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people's movements and proximity to infectious people. Contract tracing apps and location trackers have been deployed in Hong Kong, and China has begun a bold mass experiment in using data to regulate citizen's lives – mandating the use of smartphone software that dictates whether people should be quarantined or permitted entry to subways, malls and other public spaces.

Google and Facebook are currently considering methods to analyse the collective movements of millions of users to determine how the COVID-19 virus is spreading across the US, and to gauge the effectiveness of calls for social distancing among other policy interventions.

There is a darker side to this state surveillance of public health. A New York Times analysis of the Chinese software's code found that the system does more than decide in real time whether someone poses a contagion risk. It also shares information with the police, establishing a precedent for new automated social control systems that could outlast the pandemic. However, around the world uptake levels of contact tracking apps are notably low, not only rendering them epidemiologically ineffective, but also potentially signalling a limit to public tolerance for data extraction.

GOVERNING SURVEILLANCE

A growing dependence on digital tools to monitor the spread of disease raises important questions about how to prevent governments from using those same tools to track individuals for other purposes. Could the pandemic herald a darker future of totalitarian state-surveillance as well as companies and non-state actors surveilling people on behalf of the state or for their own interests?

Currently, governments are rushing to implement digital surveillance systems without due process, deliberation, or informed debate. Legislation has been passed during coronavirus lockdowns around health surveillance during coronavirus lockdowns without any debate in parliaments, permitting governments to track, monitor and control their citizens. And, in March 2020, the idea of immunity passports linked to ID documents was being discussed by experts and policymakers in Germany, Italy, the UK, and US.

There are currently unprecedented levels of surveillance, data based business models and misinformation. In Canada, for example, some provinces have given expanded police powers in response to the pandemic, and there are concerns that there are unequal patterns of law enforcement across the country. But when do the ends justify the means? How do you know when things have returned to 'normal', so these measures can be rolled back?

In our sensemaking workshop, people raised questions such as:

- "Is it right that people / end users use technology to "spy" on each other?"
- "Who gets to decide which party is doing something wrong?"
- "It appears to be true that people respond to a feeling of loss of trust in society by carrying out more surveillance of the people around them… What is this fabric of trust that people are missing and how can it be restored?"

These trends and signals show the ease with which ambient technologies such as contact tracing apps mentioned above, as well as biometric readers, temperature sensing cameras (India, China) and drones (Italy, India) are facilitating large scale top-down health surveillance measures. This is only likely to get easier if specific checks and measures are not put in place

immediately. Scientists, technologists, and researchers concerned about the consequences of such an uptake have already begun to voice their concerns.

Detailed plans for how people move in physically distanced ways through shops and offices shows the level to which ambient body surveillance could become the norm. Where does this lead? Body temperature cameras embedded in our public infrastructure, connected to our income, insurance, and credit scores? Or will people want to hack the interfaces that make our bodies active interfaces of health surveillance? What might such hacks look like?

HEALTH BORDERS

In the same way that people can be denied entry to countries for medical conditions, and pregnant women are put under scrutiny for wanting to fly to Saipan, a U.S. island in the Pacific (if they give birth there, their child is a US citizen and therefore they have rights), what if ambient technologies made it easier to governments to bar you from countries due to the ease of data collection and sharing about your health?

What would a future of human movement look like when ambient surveillance technologies help states constantly redraw borders based on personal health data?

Framed as an urgent and unprecedented threat, the COVID-19 pandemic could see governments and policymakers advocating to set aside previously sacrosanct commitments to privacy and civil liberties. Or, like the 9/11 attacks, it could mark a moment in which panicked citizens will accept new erosions on their freedoms, only to regret it when the imminent danger recedes.
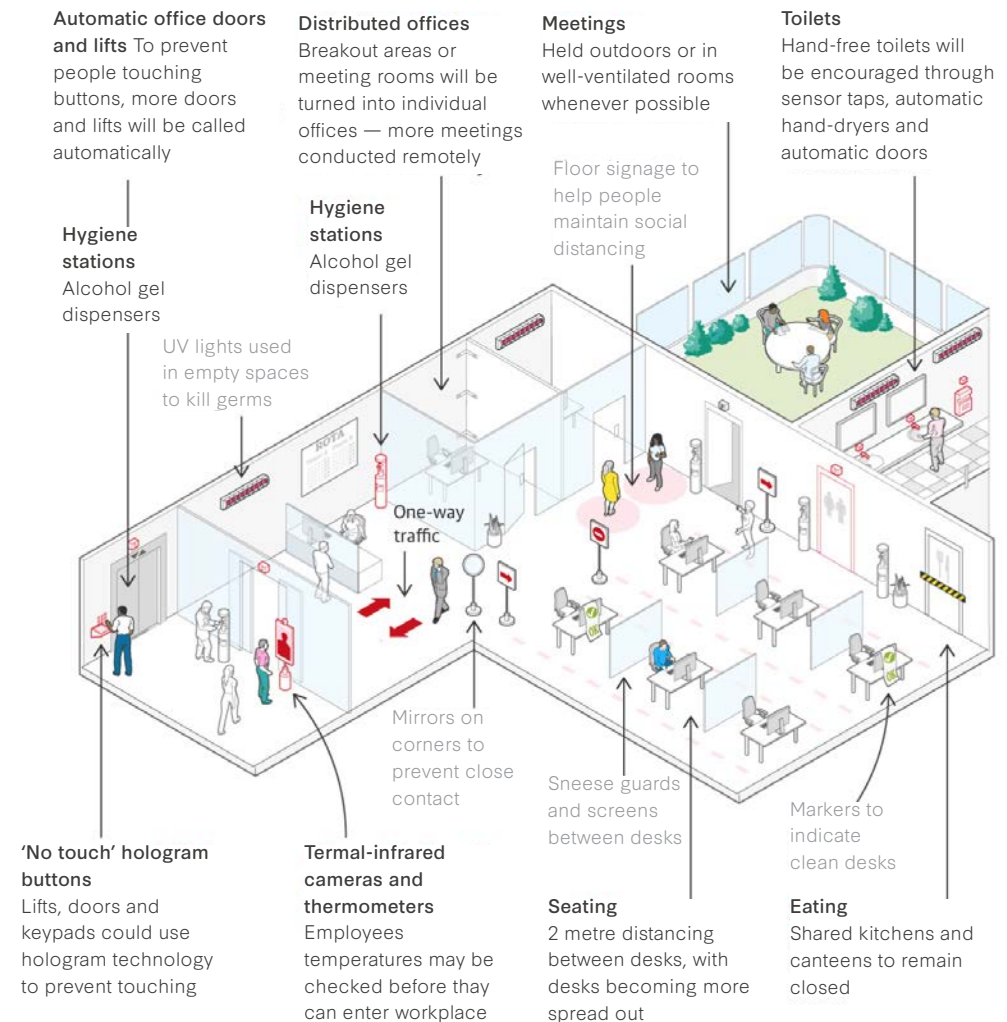
Automatic office doors and lifts To prevent people touching buttons, more doors and lifts will be called automatically

Distributed offices Breakout areas or meeting rooms will be turned into individual offices — more meetings conducted remotely

Meetings Held outdoors or in well-ventilated rooms whenever possible

Toilets Hand-free toilets will be encouraged through sensor taps, automatic hand-dryers and automatic doors

Hygiene stations Alcohol gel dispensers

Hygiene stations Alcohol gel dispensers

Floor signage to help people maintain social distancing

UV lights used in empty spaces to kill germs

One-way traffic

Mirrors on corners to prevent close contact

Sneese guards and screens between desks

Markers to indicate clean desks

'No touch' hologram buttons Lifts, doors and keypads could use hologram technology to prevent touching

Termal-infrared cameras and thermometers Employees temperatures may be checked before thay can enter workplace

Seating 2 metre distancing between desks, with desks becoming more spread out

Eating Shared kitchens and canteens to remain closed

Diagram: Guardian, Detailed plans for how people move in physically distanced ways

ANTIBODY POWER

People might struggle to remember or value rights to privacy when they are trying to deal with their own health concerns. With the suggestion of immunity passports, will a health or wellbeing certificate be needed? Will certain people be shut out of society whilst others are allowed back in? Would such systems favour antibody-positive workers over others, and if so, how would people respond? There already are reports that people are holding "coronavirus parties" to try and speed up the process of catching and recovering from the virus.

COMMODIFIED BODIES

What if personal health data becomes a commodity? Could such data be sold or exchanged as a commodity in order to thrive? Would you seek to buy online data/profiles to increase your value? Would the black market surge to fulfil demand? How might individuals and groups be incentivized to contribute their bodies, efforts, and observations? Alternatively, how would people pay for the right to be forgotten? What kinds of information can people provide that remain inaccessible to systems?

This could see the emergence of a new form of 'haves' and 'have nots': an emerging digital class that favours those with technological literacy, expertise,

access to tools and equipment. What are the implications for those who are alienated or minoritised, and therefore not considered valuable?

BODIES-IN-THE-LOOP

These extrapolations raise questions about how ambient technological systems designed for, and trained on, a certain set of scenarios and people, norms, and behaviours adapt, change, recalibrate when the frames, contexts and conditions of our present day life are changing so rapidly.

A central question becomes: what can people do that technology cannot? What capacities remain uniquely human? In what situations do these capabilities come to the fore?

Could there be value in human intelligence teams, such as distributed networks of citizen scientists, being incentivised to submit street-level information (e.g. data, signals, observations) to centralised repositories for analysis? What would be required for this to offer an alternative to the mainstream news media? We might hope that it could be cheaper, more accurate, and more responsive than automated systems — but this would also require new processes of verification and quality assurance, alongside defence from new, crowd-based DDoS (distributed denial of service) attacks seeking to distort this data collection.
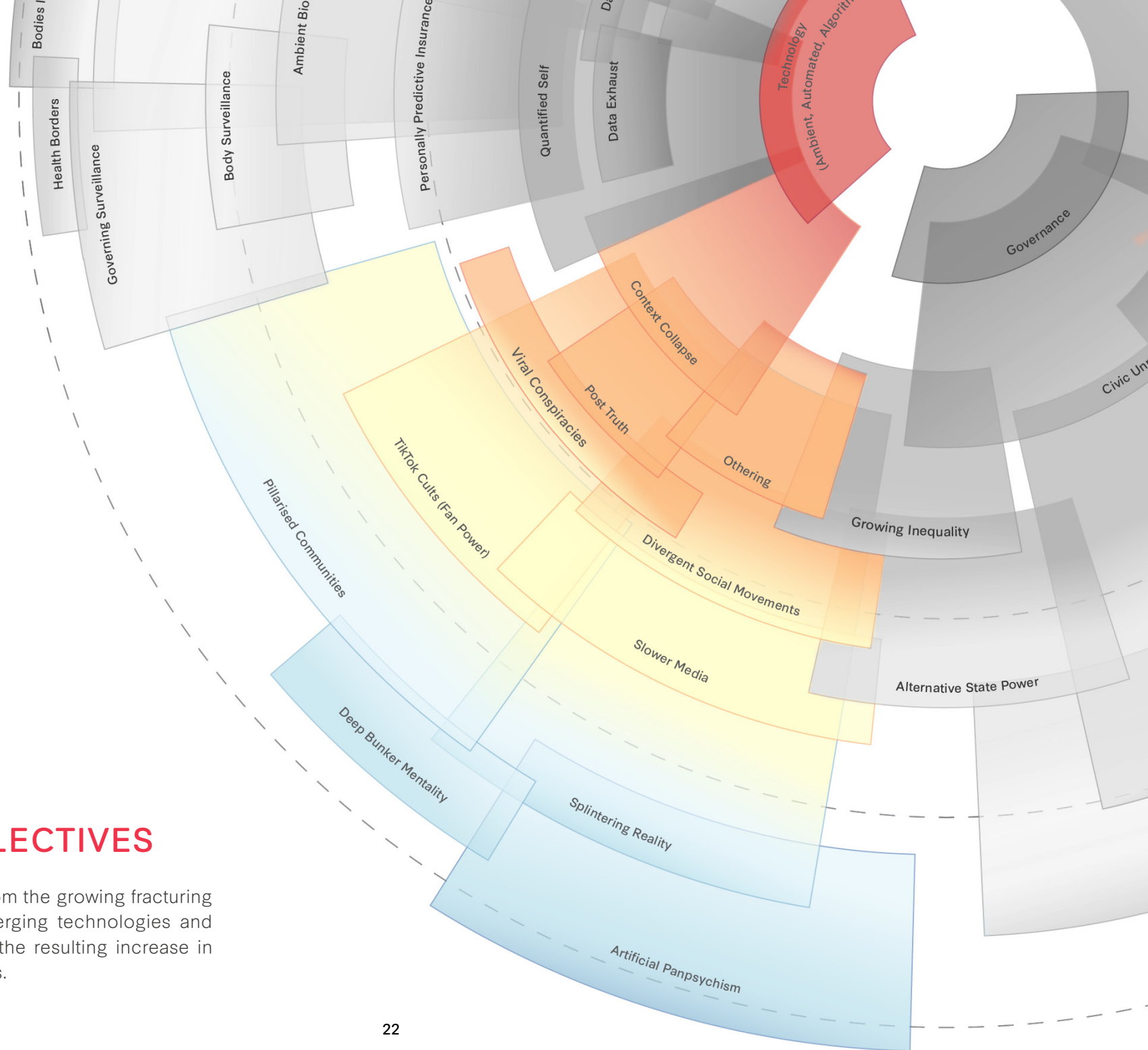
CHAPTER 5: COLLECTIVES

In this section we draw a thread from the growing fracturing of dominant narratives about emerging technologies and the rise of a new 'culture war', to the resulting increase in collective fragmentation and chaos.

Labels in diagram:
Bodies
Health Borders
Governing Surveillance
Body Surveillance
Ambient Bio
Ambient Bio
Personally Predictive Insurance
Quantified Self
Data Exhaust
Data
Technology (Ambient, Automated, Algorithmic)
Governance
Civic Unrest
Context Collapse
Post Truth
Viral Conspiracies
Othering
TikTok Cults (Fan Power)
Divergent Social Movements
Growing Inequality
Pillarised Communities
Slower Media
Alternative State Power
Deep Bunker Mentality
Splintering Reality
Artificial Panpsychism

CONTEXT COLLAPSE

Whilst digital publishing and broadcasting platforms have amplified diverse voices and created new ways of forming and sharing ideas, the uptake of digital communication technologies has also resulted in the phenomenon of context collapse – whereby personal identity is condensed, or collapsed, to navigate an imagined audience in digital spaces.

The term was coined in 2010 by media theorist Alice Marwick and Principal Researcher at Microsoft Research, Danah Boyd. Their findings showed that social media technologies make it difficult for us to handle our own multiplicity, and the multiplicity of our potential audiences.

Not only do we try to squash our complex selves into categories with clearly signifiied social, cultural and political ideologies, we also fail to acknowledge the diversity and amorphous natures of different people and individuals over time. Most of us are guilty of quickly 'othering' those we encounter online if they do not adhere to the clearly defined belief systems we find acceptable. We categorise them as not being like 'us'. This is partly about self-presentation, but is also concerned with certain cognitive biases that appear to become exaggerated in digital interactions. Group polarization is able to escalate even faster when it clashes with the reduction of self associated with context collapse.

OTHERING

Discovering the profound diversity of perspectives in the world is certainly one of the positive stories of the internet. Unfortunately, concurrent to his

acknowledgement of difference comes increased examples of 'othering' (or 'us and them' thinking). 'Othering' is a biased propensity to homogenise, oversimplify and distrust those outside our perceived in-group. This reduces tolerance of the individuals who don't adhere to the expectations of one's own ideological leaning.

This can be seen on the platforms that are supposedly promoting our freedom of expression. As writer Rob Horning writes, "For its rituals of inclusion to have any emotional weight, TikTok must also make a spectacle of the excluded. The incentive to produce new victims gets stronger as the app's rationale as an organizer of social hierarchy gathers momentum."

We are increasingly looking to the content which validates our world views, and it is easier to find it when content is being constantly pumped out. We can, and do, cherry-pick information that confirms our knowledge bases – creating a positive feedback loop that further entrenches our existing views and beliefs.

POST TRUTH

Social media and other publishing platforms have helped perpetuate the idea of the post-truth world – a world of multi-layered fictions, further entrenching us in our social, cultural and ideological positions and filter bubbles. Fractured narratives are being used as weapons to manipulate shared understandings of reality, further fueled by algorithmically mediated technological networks.

It is a space that fosters the polarisation of ideologies and power plays, a fight of philosophical positions, a fragmentation of once-unifying narratives, a contestation of truth, with multiple people laying claims to it, often in contradictory ways.

VIRAL CONSPIRACIES

In everyday life, many of our choices and beliefs occur as a result of automatic affective impressions and emotions over which we have little control. According to author Will Davies, as trust in institutions and the media erodes, favouring feelings over facts is becoming increasingly commonplace. Overloaded with content, there is little opportunity for us to stop and evaluate fact from fiction, and decisions are made for instinctual and affective reasons. Viral content is shared like it is public property, and can take on new meaning in new contexts.

This is something widely seen during the COVID-19 pandemic where, for example, scientific information showing how radiation from 5G can affect human cells has fed into conspiracy theories that 5G is somehow responsible for the COVID-19 virus, with 5G towers vandalised or destroyed as a result.

"It's like a rabbit hole, like now they say do not take ibuprofen if you have COVID or that 5G caused COVID." — **James**

"So you guys don't believe in the whole 5G theory then? Wuhan was a test centre for 5G last year." — Kate

This viral content is frequently uncoupled from its author, and so there is no one to hold accountable when it is offensive. There is concern that content using ethnic or racial humour can lower barriers to committing acts of violence against the communities that are the subject of such jokes. This is particularly concerning right now, as there has been a rise in racist attacks on Asian communities due to people believing they are responsible for the current pandemic.

DIVERGENT SOCIAL MOVEMENTS

A growing number of people feel excluded from the benefits of recent economic booms, and unsettled by fast-changing social structures. The underlying prejudices and entrenched beliefs of this disenfranchised citizenry are exploited by authoritarian and populist ideologues to maintain economic

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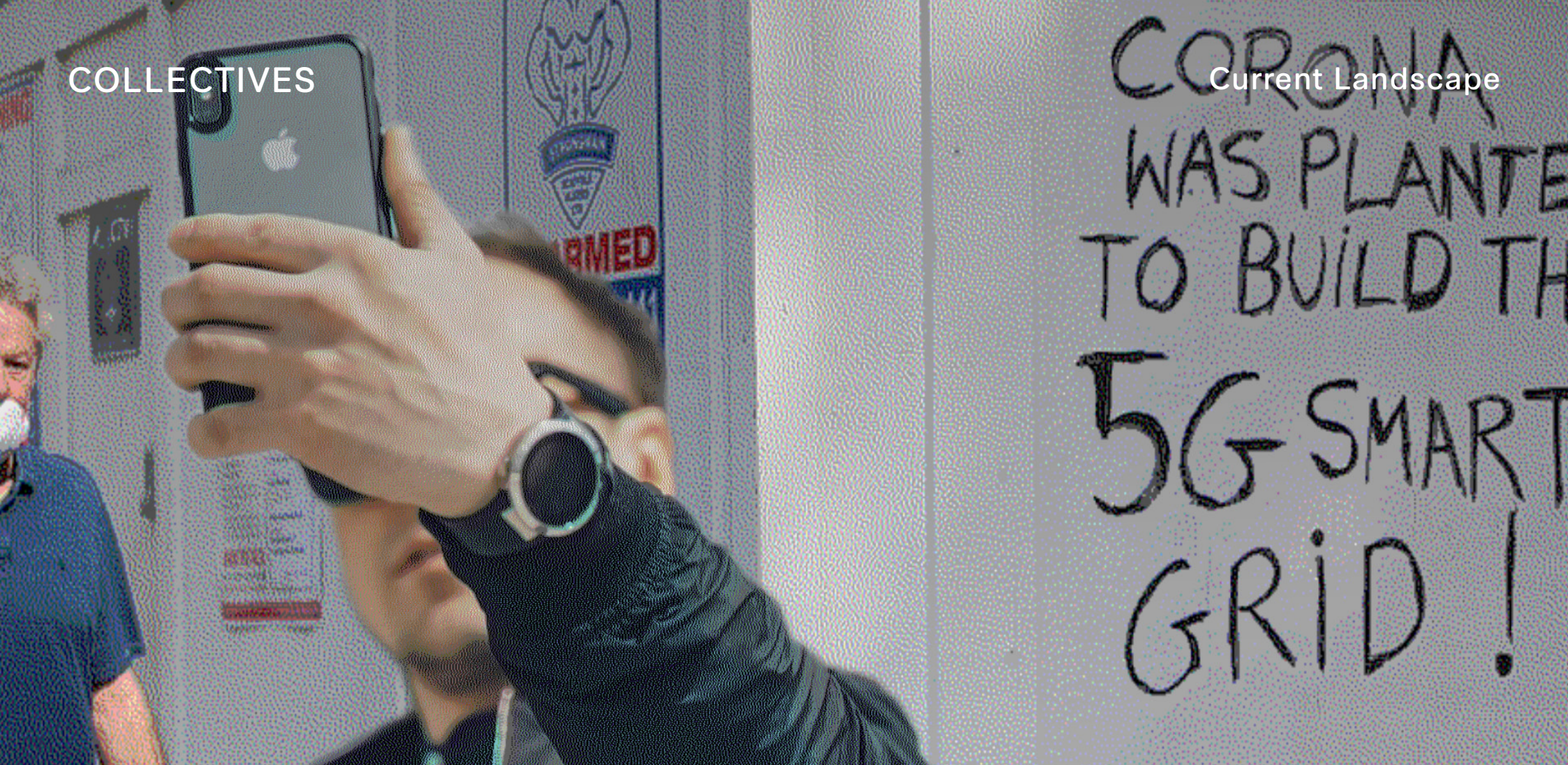
and social inequality, facilitated by the ease of access to social media platforms with their profit-programmed algorithms. As such, ordinary people around the world play a central role in the rise in widening reach of alt-right and far-right ideologies and politics.

At the same time, we are seeing the use of the same platforms to spread the activist missions of groups like Extinction Rebellion, supporters of Standing Rock Indian Reservation, and Occupy. Four months after Greta Thunberg started her climate strikes outside Sweden's parliament building, she had been joined by tens of thousands of students around the world who had seen and identified with her climate messages online.

Polls have shown that, at time of writing in June 2020, the recent Black Lives Matter protests and online activism has increased support for their campaign by nearly as much as in the last two years combined. Legislation reform has been drafted, diversity commissions have been launched, and many CEOs are looking deeply at what is happening within their organisations. But there was backlash against the movement in 2017, and there is likely to be again.

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The rapid, global spread of these movements results in change, but also deeply divides. #MeToo became a viral phenomenon within a day in 2017, spreading awareness about the prevalence of sexual harassment and assault globally. Although it was celebrated by many, leading to changes in legislation and justice for victims, a NPR-Ipsos poll showed that America was deeply divided about the subject of sexual assault and harassment, with almost 40% of people surveyed agreeing the movement went "too far" in ruining people's careers or reputations. Greta Thunberg has also been a figure of controversy, with right-wing voices protesting against 'being lectured to' by a child, and claiming that she is merely a front for adult interests. Amidst fragmentation and polarisation, there are some countervailing forces – and moments of collective action both positive and negative.

SLOWER MEDIA

The retweet sharing mechanism is one of the distinctive affordances of Twitter as a social network, first arising as a user behaviour (manually typing RT @ username, then quoting) before being baked into the platform as a feature. Yet in the decade since, the feature has come in for criticism for how it enables provocative messages to spread extremely rapidly, at the momentary click of a button – which aids the spread of misinformation and harassment on the platform. In 2019, the retweet's creator, software developer Chris Wetherell, described the feature as akin to "handing a 4-year-old a loaded weapon".

Media commentators argue that retweets and virality need slowing down in order to facilitate more considered communication and produce a healthier media ecosystem. In 2019 writer Robin Sloan argued that "Negative feedback is the feedback of stability and health", and explored ways it could be introduced to Twitter as a social network. He proposed limiting the reach of a tweet in order to slow its diffusion through the social network: "No reasonable human needs more than 10,000 other humans to read their words within twenty minutes of writing them."

In April 2020, WhatsApp introduced limits to virality, constraining the number of times a message could be forwarded in order to tackle the platform's misinformation problem. Twitter's "platform health" initiative has also seen the company introduce some layers of 'friction', prompting users to "revise" their replies if they were about to send tweets with "harmful language", and suggesting people click on URLs and read the contents before sharing them. The prospect of a 'slower' social media may be welcomed by many, but it raises questions about who gets to determine what 'health' on a social network entails.

TIKTOK CULTS (FAN POWER)

Several major social media platforms, such as Snapchat and Instagram, don't share ad revenue directly with creators. If creators don't get paid per view, then how can their followers be of value to them? Most creators are seeking straightforward solutions through corporate sponsorship and/or merchandising sales, but some influencers are becoming creative in ways they generate other kinds of value from their audiences – for example, the emergence of "TikTok cults", e.g. the Stepchickens, where legions of fans are willing to do as an influencer commands, to sometimes chaotic ends.

Other fandoms are becoming semi-autonomous of the artists they form around, and are using their scale and social media power for good. Fans of K-Pop bands such as BTS claim to have raised one million dollars for Black Lives Matter and engage in digital activism (such as flooding far-right hashtags with offensive content). Fan identities can offer a rallying point for not only chaos, but cross-community solidarity, too.

These trends and signals demonstrate how inter- and intra-community relationships are being shaped and curated by technologies, in turn changing how we relate to each other. The consequences of this may include:

PILLARISED COMMUNITIES

By helping us to access and create personalised content, ambient technologies may allow us to become further entrenched within our echo-chambers of belief, resulting in a pillarisation of society, where multiple pillars have little or no personal contact from outside, but are supported internally by new digital infrastructures.

'Pillarisation' is a concept from the Dutch concept of verzuiling, referring to "vertically divided" societies where each 'pillar' has its own social institutions, from media to political parties, trade unions, schools, banks and hospitals. In these segregated societies, people may have very little personal contact with people from another pillar. This divided society weakens social solidarity and public institutions, and is something internet theorists see as undesirable:

> *"Our lives are relational, inter-relational and connected. Our individualism does not trump our pluralism and our societalism"* — **Anasuya Sengupta, Decolonising the Internet**

SPLINTERING REALITY

What if our world splinters into multiple realities that no longer speak past each other, perpetuated by a continuous, discordant onslaught of news and conflicting ideas through media channels? Further fragmented, instead of coming together for a common global good, we band together for our nation/state or even individual group needs.

The fragmentation of society, combined with our creator-driven culture of broadcasting, could see multiple groups struggling to marshal followers and have their viewpoints heard, creating different forms of coercive narratives.

Ultimately, this could see ontological or narrative breakdown – a loss of common reference points as the world fragments into totally parallel realities. It is important to consider how ambient technologies could perpetuate such fragmentation, potentially even leading to wider upheavals and civic unrest.

DEEP BUNKER MENTALITY

During this pandemic, we are temporarily untethering from physical space. But this will not last and some are observing that "the general tendency seems to be towards a world that will actually be less globalised than before – 'a Great Unwinding'." People could respond to this fragmentation by opting out, leading to a post-COVID deep bunker mentality — creating a subset of people rejecting public life entirely, whether through fear or mistrust. Similarly, we might see a reorientation of life towards domestic or private spaces and closed community groups. As ambient technology increasingly takes on a role in individual and community care during prolonged social distancing measures, what new forms of collective care might emerge?

Will people start forming extremely personalised communities in real life, which we might imagine as 'subreddit towns', after the many separate subcommunities of Reddit (the world's largest online forum)? What happens when people evacuate or remove themselves from the public realm? What systems break? Which institutions cease to function?

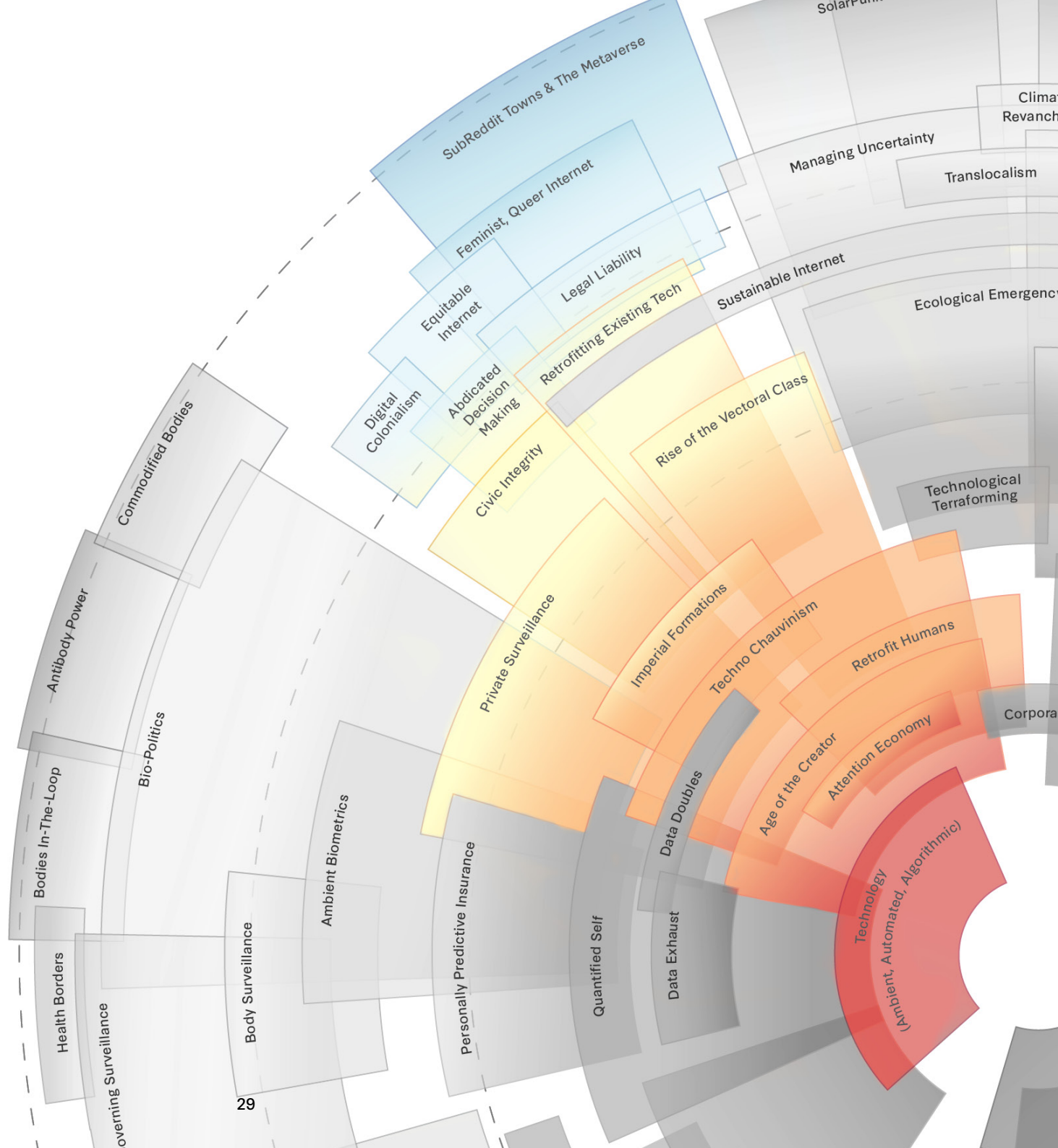IMAGE: *National Radio Quiet Zone, USA, Green Bank, WV.*

ARTIFICIAL PANPSYCHISM

This is the expansion of an age-old idea that whatever mechanism creates the human mind need not be limited to humans. Digital and computing systems are being developed that have features that are associated with consciousness, "a kind of self awareness". In developing these there is the creation of an artificial panpsychic world where consciousness is fundamental and ubiquitous – and not the unique property of human beings.
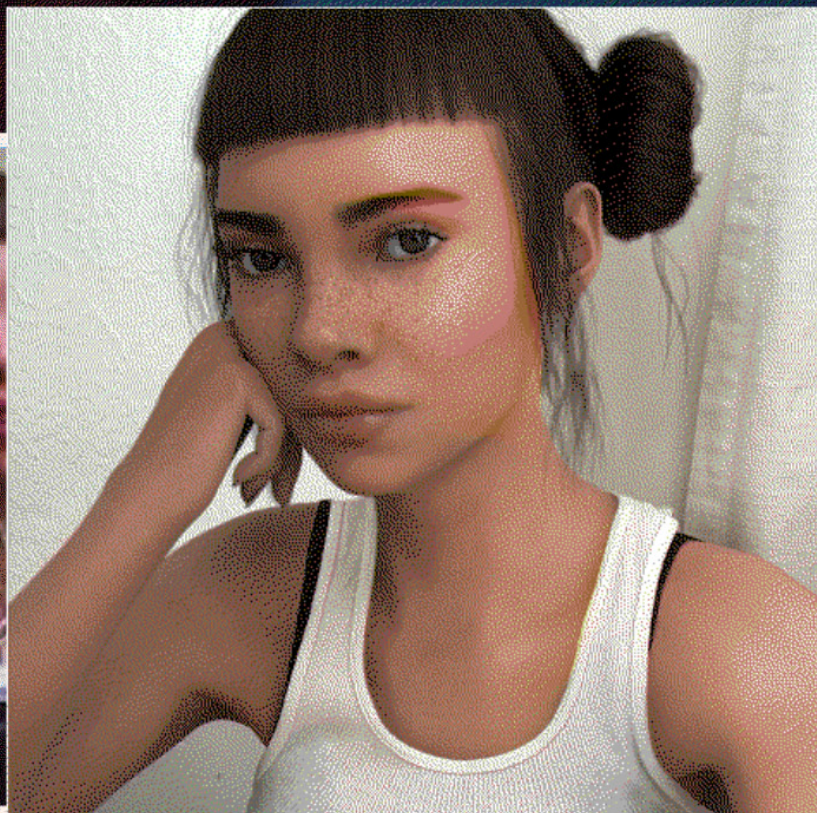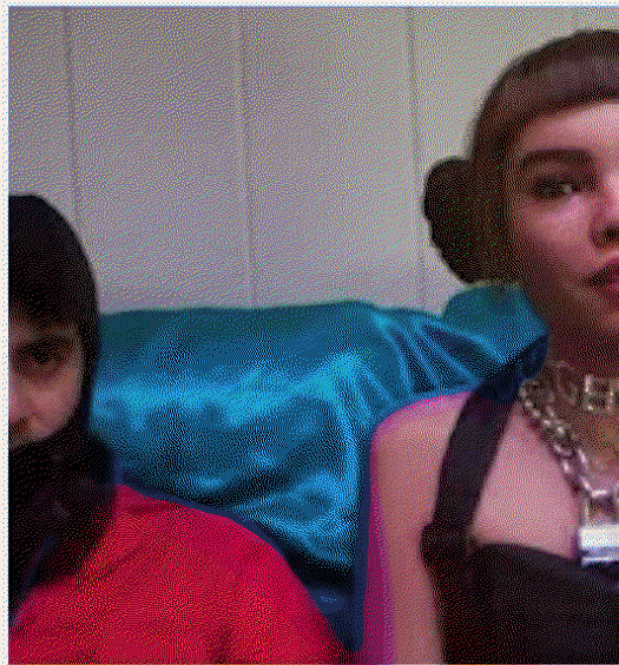
Whilst we can distinguish between these technologies and biology for now, the future of ambient technologies may blur the boundaries. As science writer George Musser speculates, "What seems like high technology to us now might seem like a law of nature to future generations." In such a world, fragmentation may not only exist within human communities, but between different forms of consciousness and life, too.

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CHAPTER 6: TOOLS

In this section we draw a line from the phenomenal rise of the individual creator or publisher due to free online tools and platforms promoting connection and opportunity, to the implications for the future of digital technologies and our online spaces, as they develop into virtual and immersive ambient worlds.

SolarPunk

Climate
Revanch

Managing Uncertainty

Translocalism

SubReddit Towns & The Metaverse

Feminist, Queer Internet

Sustainable Internet

Equitable Internet

Legal Liability

Ecological Emergency

Retrofitting Existing Tech

Digital Colonialism

Abdicated Decision Making

Rise of the Vectoral Class

Technological Terraforming

Civic Integrity

Commodified Bodies

Antibody Power

Private Surveillance

Imperial Formations

Techno Chauvinism

Retrofit Humans

Bio-Politics

Corpora

Bodies In-The-Loop

Age of the Creator

Attention Economy

Ambient Biometrics

Data Doubles

Health Borders

Personally Predictive Insurance

Quantified Self

Data Exhaust

Technology
(Ambient, Automated, Algorithmic)

Body Surveillance

overning Surveillance

lilmiquela ✔ · Follow

lilmiquela I'm thinking about everything that has happened and though this is scary for me to do, I know I owe you guys more honesty.
In trying to realize my truth, I'm trying to learn my fiction.
I want to feel confident in who I am and to do that I need to figure out what parts of myself I should and can hold onto.

I'm not sure I can comfortably identify as a woman of color.
"Brown" was a choice made by a corporation.
"Woman" was an option on a computer screen.
my identity was a choice Brud made in order to sell me to brands, to appear "woke."
I will never forgive them. I don't know if I

AGE OF THE CREATOR

Ambient, digital technologies, with their immense computational power and far-reaching networks, have enabled almost anyone with a smart phone and access to the internet to be a creator.

The dream of Web 2.0 technologies was that anyone could be a publisher, managing their own publications on their own domains, enabled by free, open source publishing tools such as Wordpress. Yet the rise of social media has seen that dream change: now, the means of production is owned by the megaplatforms of Facebook, Google, and so on, and users are merely 'creators' posting on owned terrain.

This age of the creator, where we broadcast seemingly freely, and with unprecedented potential reach, has created an illusion of liberty. Yet how much are we truly expressing ourselves, or producing original content – and

how merely much mimicking established forms? This is exemplified by the rise of TikTok, known for its dance memes and viral content tropes, which has seen unprecedented global adoption (the fastest app to 1bn users, in just three years).

Recently, lockdowns have spurred a new wave of growth, and also political messaging, at a time when so many of us are only able to communicate via such digital tools, and yet are collectively facing fears around coronavirus, police violence and Black civil rights.

ATTENTION ECONOMY

In 1997, Michael H. Goldhaber wrote, "Is there something else that flows through cyberspace," beyond information, "something that is scarce and desirable? There is. [...] It's called attention. And the economy of attention – not information – is the natural economy of cyberspace."

He warned that, "Attention has its own behavior, its own dynamics, its own consequences. An economy built on it will be different than the familiar material-based one." We see the social consequences today, as content and activities that have previously been seen as fringe are now widely embraced as normal. Large numbers of people enthusiastically participate in social challenges and share the latest memes, caught in a cycle of creating, posting, sharing, liking, and thereby feeding the algorithms of digital platforms, whether posting a near identical composition of 'iconic' views on Instagram, emulating the lifestyle of fashion influencers on YouTube, or sharing the latest Anthropocene think-piece on Twitter.

Yet in promoting our creation activities, the platforms entice us to produce content that has value for them in exchange for the free use of their platforms and services. Masses of personal data about financial transactions, leisure activities and population movements are mined, from smartphones, wearable devices, internet searches, online orders and social media. This data is analysed, compared, integrated and on occasions even traded without our explicit consent.

Whilst we are keen to use these platforms and produce data, we usually don't have an oversight of what data is collected, how it is packaged and used, and by whom. Whilst we don't pay money to use them, we are paying with our time, our attention and our data. This has turned us into a global digital labour class.

"We discovered that the [Amazon] Echo had been recording all of our conversations without consent, but we found logs of our conversations on the app so we are now a lot more conscious when we want to have private conversations we mute it." — **Betty**

"The phrase 'transformation' is an interesting one, as we are looking at an invisible transformation. The phrase 'ambient' seems to suggest it's happening in the background, not demanding your full attention. People's lives will be changed in ways that they don't actually realise, while it is still happening to them" — **Tim Maughan, Author**

RETROFIT HUMANS

The way in which we talk about the power and value of voice interfaces and other emerging technologies often eliminates the human user from the narrative. This has led to the phenomenon of the 'retrofit human', a term coined by Rumman Chowdhury to describe the phenomenon of "adjusting humans to the limitations of the AI system rather than adjusting the technology to serve humanity."

Our ethnographic work showed that the attribution of human qualities to voice interfaces was widespread, as use of the technology created more personal experiences and 'natural' interactions.

In the sensemaking workshop a few people remarked: Are people trusting technology too much? Will their level of trust change if cracks begin to show?

TECHNO-CHAUVINISM

The small group of highly influential companies producing and perpetuating such technological systems reproduce an ideology that data journalist Meredith Broussard calls 'techno-chauvinism': she defines it as "the idea that technology is always the highest and best solution, and is superior to the

people-based solution." Such chauvinism emerges from the belief of a small group of homogenous people, located primarily in Silicon Valley, that they are the best people to deploy a small set of algorithmic applications to administer human life.

"We assume that [people] can't be trusted to design these futures. They have to be designed by 'those in the know' " — **Andrew Zolli**

"Surveillance could work well in a well-established system where there was no risk of infringing individual personal lives, but no such system exists." — **Karim**

Despite ongoing efforts by women and non-binary people, and Black and Latinx people, to gain entry into technology companies and the higher ranks of

management, the demographics of these firms remain heavily skewed – with predictable consequences for the tools and technologies they build (not least AI and facial recognition).

PRIVATE SURVEILLANCE

The Silicon Valley credo that collecting data is inherently valuable has driven a belief that digital surveillance is necessary to make 'easier' or for 'better' or 'safer' experiences. Whether we are aware of it or not, we are under constant, commercial surveillance, which is justified on the grounds of crime prevention, business intelligence, road safety or public service improvement.

In society, surveillance is sometimes replacing word of mouth in people's trust of others. Recently, Australian universities sparked outcry over plans to use

proctoring software to monitor students through webcams as they sit exams from home. It enters, too, into our personal interactions:

> *"We had a girl look after our dogs once and when I later went through the CCTV I realised she didn't walk them once and even brought a random man back to stay overnight."* **— Betty**

IMPERIAL FORMATIONS

Information captured by private and corporate data collection becomes a resource for state intelligence to mine for its own ends. State actors spin off products to sell to other state actors to track their citizens: China sells CCTV analytics to Ecuadorian domestic intelligence; British firms to sell surveillance tech to Hong Kong, Saudi Arabia, and other repressive governments with the government's blessing.

As communications studies scholar Paula Chakravartty suggests, these entanglements need to be followed and understood as complex imperial formations, built on imperial rivalries and a tech worldview that imagines some figures – especially those from migrant and minority communities – as outside the world of tech itself.

> *"The level between tech and authoritarian govt is something to look at very carefully when we talk about tech futures. If we look at COVID-19, the surveillance architecture is almost gleeful being used right now"* — **Anasuya Sengupta, Decolonising the Internet**

> *"The way data and technology is used today is anti-democratic, anti-freedom."* **— Leila**

RISE OF THE VECTORAL CLASS

The persuasive adoption and embrace of such ambient technologies is no accident. Facilitated by capitalist ideologies, concentrated wealth, and investments in increased computation capabilities, networks and speed, a seductive technological narrative of individual and community emancipation has been aggressively marketed by the owners and producers of such technologies.

Those who own the information that moves through such technology platforms, services and systems are labelled by scholar McKenzie Wark as the Vectoral Class, "so named because they control the vectors along which information is abstracted."

> *"We are supposed to think of ourselves as producers of information, competing with each other for attention. All the while the information we both consciously and unconsciously produce is mostly for the benefit of a vectoralist ruling class."*

> *"The vectoralists own not only the means of production, as with the capitalists — in fact, the vectoralists own the capitalists — but also the greater communicational and distributional means and infrastructure that control how our information permeates the world via our new technology. They alone know the secrets of how to analyze this data for their exclusive profit and greater overall societal control."* — **McKenzie Wark**

Computational tools have become fully integrated into nearly every aspect of our lives, curating our knowledge and shaping our communities. They have the potential to influence the outcomes of elections and change democratic processes, reinforce and increase fragmentation in hyper-connected social systems, and affect our health and safety. Emerging themes include:

RETROFITTING EXISTING TECH

People are using new (and old) technologies to manage their exposure to content, police the edges of their networks, and create their own contact tracing systems from the bottom up. Tools include ad-blockers, web browser plugins, the "Twitter Demetricator" (which hides follower and retweet counts), and collective filters and shared block lists which make mitigating harassment a community-wide project.

CIVIC INTEGRITY

In June 2020, Twitter chose to put warnings and links to fact-checking resources on Donald Trump's tweets about responding to protests with military force, citing their civic integrity policy. Yet Facebook chose not to take this approach, citing the news value of Trump's pronouncements as head of state. Facebook's CEO Mark Zuckerberg subsequently faced public criticism and staff virtual walkouts.

This raises questions about the role(s) these and other free platforms and tools will play in the future of our civic society. Who decides what civic integrity is? Recognising the problems with vesting this responsibility in one man (Zuckerberg), Facebook are in the process of setting up an Oversight Board

staffed by diverse global governance experts, in order to provide a more legitimate authority for making decisions about permissible speech. There has however been criticism of the slow roll-out.

ABDICATED DECISION MAKING

Informing and consulting people about new technologies is often hard to do and/or poorly done – though there is little room for error. 5G conspiracy theories are underpinned by a lack of public and community engagement by telcos and governments, who have failed to earn permission for these technologies. The risk may be that technology is seen as such an unalloyed good that there is no need to consult or decide on its extensions at all. Yet, quite the opposite — It raises the stakes of getting things right from the start.

Computer scientist Joseph Weizenbaum once wrote that technological metaphors have pervaded our thought processes so thoroughly that "we have finally abdicated to technology the very duty to formulate questions."

Author Audrey Watters, writes about the fear that we might offload caring and affective labour to technology, saying we need to "resist this impulse to have the machines dictate what we do." Currently, there is only the appearance of responsiveness in current machines – they cannot truly care, and we must do a better job of caring for each other instead. But with developments in ambient technologies, if machines are increasingly anthropomorphised, will we be able to resist assuming their benevolence? Will we expect more from machines, and less from each other?

LEGAL LIABILITY

Who is responsible when things go wrong? Automated decision-making raises difficult questions of legal liability: does it lie in the technology's owner? The original manufacturer or algorithm developer? Or does autonomy require machines to become legally responsible themselves? A humans-in-the-loop approach to ambient technology development could potentially address this issue. Instead of framing automation as the removal of human involvement, the selective inclusion of human participation can make systems more transparent and shift pressure away from creating perfect algorithms.

We face significant legal – and ethical – risks in years to come. What if there is a Hindenburg-like scenario where one big, spectacular failure results in a substantial loss of life or does permanent damage to a major technology platform, and/or technology's public image? What happens when surveillance and ambient intelligence systems become magnets for hackers, those with grievances, and those who stand to gain from manipulating the system?

Our legal system already struggles with attributing legal accountability to corporations, particularly in cases of environmental destruction and pollution. The company as a whole may be fined, but executives tend to escape accountability for loss-of-life: the decision-making is too diffuse, and at too far a remove. A humans-in-the-loop approach might, in future, help us address more than technological risk.

DIGITAL COLONIALISM

The concept of "Digital colonialism" or "Electronic colonialism" was first outlined by Herbert Shiller in his 1976 book Communication and Cultural Domination, which looks at how digital technologies further the operation of colonial dynamics and inequalities between the Global North and Global South. This presently takes the form of a "scramble for African data" and the extraction of value back to headquarters in America, Europe and China, and we can imagine how these currents may strengthen. Technologist Anjuan Simmons also talks about "Technology Colonialism", and how it is rooted in the rise of global tech companies for the purposes of profit and plunder. It "can be seen in the veneer of sovereignty they seek to cultivate, how they work across borders, their use of dominant culture as a weapon, and the clear belief that 'superior' technology is a suitable excuse for lawlessness, exploitation and even violence."

White male supremacism is central to its operation: "Colonial powers always saw themselves as superiors over the native people whose culture was rarely recognized or respected. [...] Technology companies continue this same philosophy in how they present their own products. These products are almost always designed by white men for a global audience with little understanding of the diverse interests of end users." In this metaphor, tech companies are the colonists and stand in relation to their users as colonial states such as Britain did to the subjects of empire.

Yet, if we anticipate a deepening digital colonialism, might we also hope for (and forment) a digital postcolonialism? There is a movement for Indigenous Data Sovereignty, insisting that "indigenous peoples have inherent and inalienable rights relating to the collection, ownership and application of data about them, and about their lifeways and territories." This claim can of course be expanded to all data subjects.

EQUITABLE INTERNET

What is an alternative to the ideologies of digital capitalism? What is the alternative to placing shareholder value at the centre of decision making, rather than human wellbeing? How do we design an alternative that is more collaborative, more just, and prioritises inclusive growth?

In the next section (Ch. 7, Infrastructures) we discuss Professor Kate Raworth's concept of "doughnut economics", a model of sustainability seeking to "ensure that no one falls short on life's essentials (from food and housing to healthcare and political voice), while ensuring that collectively we do not overshoot our pressure on Earth's life-supporting systems."

What is the doughnut model for digital capitalism? What are the roles for data, AI and ambient technologies in driving equitable, inclusive growth within planetary boundaries? Or is technology too much a part of capitalist hegemony to change? Sci fi author and futurist Tim Maughan warns us that technology is enmeshed in oppressive social systems and structures:

> *"Capital does not set out to disrupt itself, but it sets out to exploit labour in ways that it can use to make more capital. It sets out to reinforce the status quo. If you want to critique how technology impacts anything, you also have to critique class, racism and economics"* — **Tim Maughan, Author**

Technology is necessarily a part of a sustainable, "doughnut" future — not least because modelling and forecasting climate change is an inherently data-intensive activity, reliant on a global network of ambient sensors and advanced machine learning. Embedding equity into this system is imperative.

SUBREDDIT TOWNS & THE METAVERSE

We might escape online. Yet what happens when our online worlds move from a screen into the fabric of our offline world? With the evolution of 5G – and the promise of faster data download and upload speeds, wider coverage, and more stable connections – many people who work in technology are speculating that there will be widespread adoption of AR and VR. The next generation of ambient technologies that emerge from this could see our online communities easily accessed through a voice assisted device or appear around us.

Excitement is growing in Silicon Valley about the "next version of the Internet", often described in this community as "the Metaverse". The term is "borne from science fiction", describing a shared, virtual space that's persistently online and active, even without people logging in. It will have its own economy, complete with jobs, shopping areas and media to consume." It's perceived as not just a temporary game or VR landscape, but a new infrastructural layer for interaction. The concept is driving VC buzz and investment, along with development pipelines at big tech companies: Facebook Horizon, announced in 2019 is a virtual reality social space for Oculus users, and the company's stake in this new terrain. Games companies may however be in the lead, with concerts held on Epic Games' Fortnite platform attracting 10-12 million participants and forming the largest ever virtual gatherings.

The concept has taken on particular salience this year, with half the world's population confined to homes on lockdown. "If we can't rely on the physical world to be a (usually) safe and coherent place, virtual space might be a pragmatic hedge," researcher Marc Geffen writes.
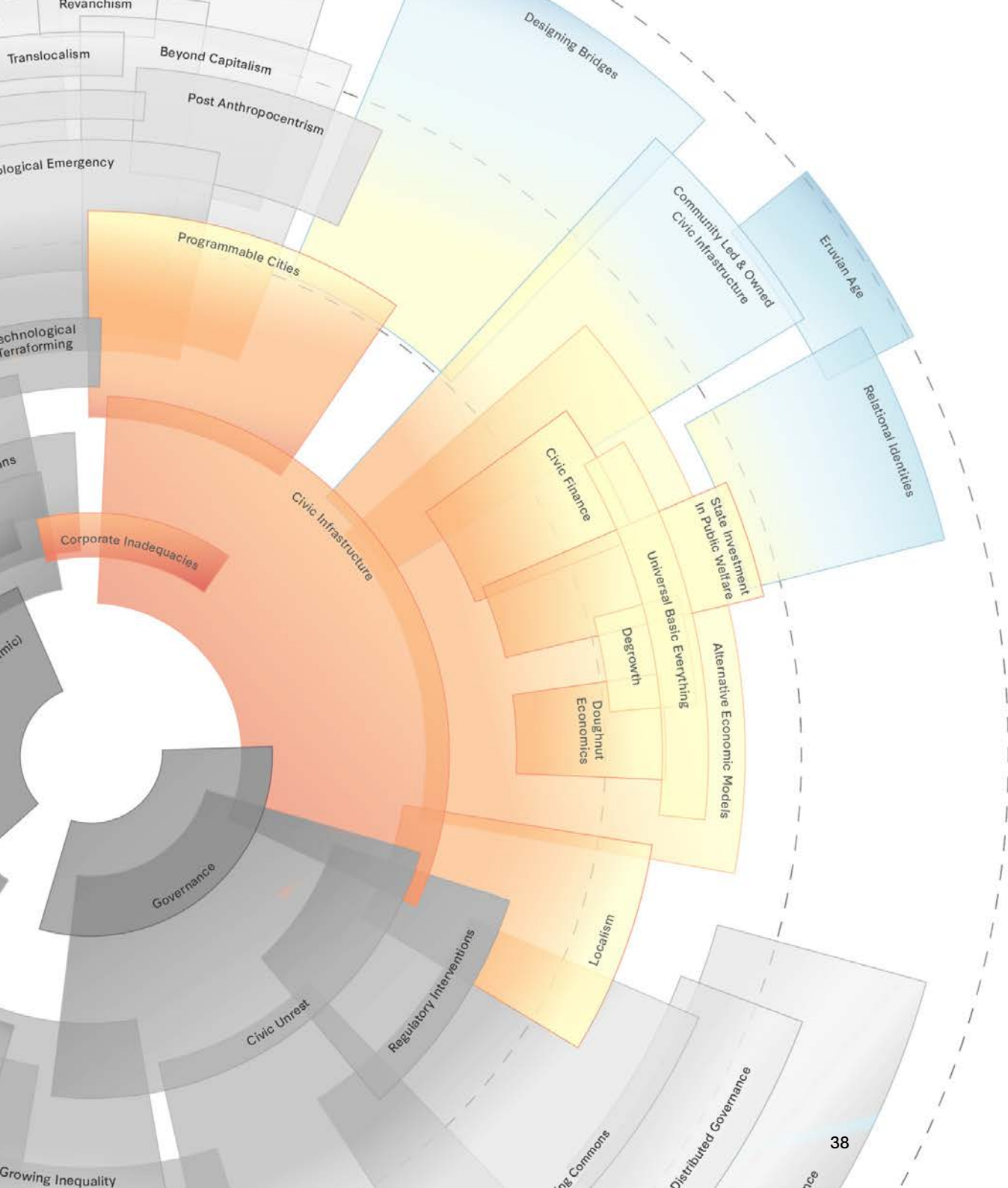
CHAPTER 7: INFRASTRUCTURE

In this section we explore the changing role of civic infrastructure, its increasing fragility in times of crisis, and what structural, organisational, social, political and technological shifts might help it would take to make our shared civic infrastructure stronger and equitable.

Civic infrastructure depends on ways in which state and non-state actors invest and support communities and their shared interests. We see this manifest in state-designed and promoted happiness indexes alongside deeper, structural policies that support civic welfare and wellbeing.

Some great examples of civic infrastructure range from city-level — such as the Atlanta's Beltline, a 22-mile ring of abandoned and active freight rail lines that is being slowly transformed into a transit and trails loop, producing a space for new communities and precincts – to neighbourhood level – such as Detroit's Fitzgerald Revitalisation Project, which has seen vacant lots turned into a park and a greenway, along with a series of neighborhood hubs for community gardens and smaller recreation spaces.

CORPORATE INADEQUACIES

With the COVID-19 pandemic, the fragility of such infrastructures of support and care have become all too visible. It has brought to the fore how top down/state design of civic infrastructure is not meeting the needs of many. In addition, where there is no civic infrastructure to help communities, there are no safety nets. It is the vulnerable that are most affected by such a crisis, from millions of abandoned migrant workers in India to the thousands of elderly in the care homes in the UK.

In contrast, specific investment, strategic and governance models have meant that places like Vietnam, Kerala, New Zealand, Taiwan and parts of sub-Saharan Africa have done very well. This points to a systemic design rather than technology. The pandemic is highlighting the inadequacies of the for-profit, corporate model in delivering vital civic infrastructure, such as high-speed internet access and the UK's contact tracing system (including criticisms of

Serco, who is recruiting the contact tracing team and Deloitte, who have handled operations at testing centres).

CITIZEN CIVIC INFRASTRUCTURE

While lack of state funded publicly open civic infrastructure is visible especially in the US, UK and several other countries, the rise of grassroots and/or community movements, aided by the easy to access, free creator platforms, are helping people create their own civic infrastructure by retrofitting existing platforms to serve community needs, and in more efficient ways.

Often organized through Google Docs, online spreadsheets, Facebook and WhatsApp groups, community-run networks are providing essential services like grocery drop offs, childcare, financial assistance, health services. Technologists are experimenting with drones adapted to deliver supplies, disinfect common areas, check individual temperatures, and monitor high-risk areas. Many groups are moving their activities online, with digital rallies, teach-ins, and information-sharing.

Where public good institutions are failing to respond to vulnerable groups that are being missed in policy design, civic-minded citizens are self-organizing and self-mobilizing to fill the gaps in public service provision. Social media is becoming a real platform for civic engagement and active interaction. Community organisers are co-opting, but also running up against the limits of corporate productivity software, such as Slack.

This bootstrapped civic infrastructure is demonstrating how technology is blurring what is 'online' and 'offline' and helping us reassess our definition of community. Many new social bonds are currently being formed digitally,

MADISON

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Image: Superflux, Project: DRONE AVIARY 2015.
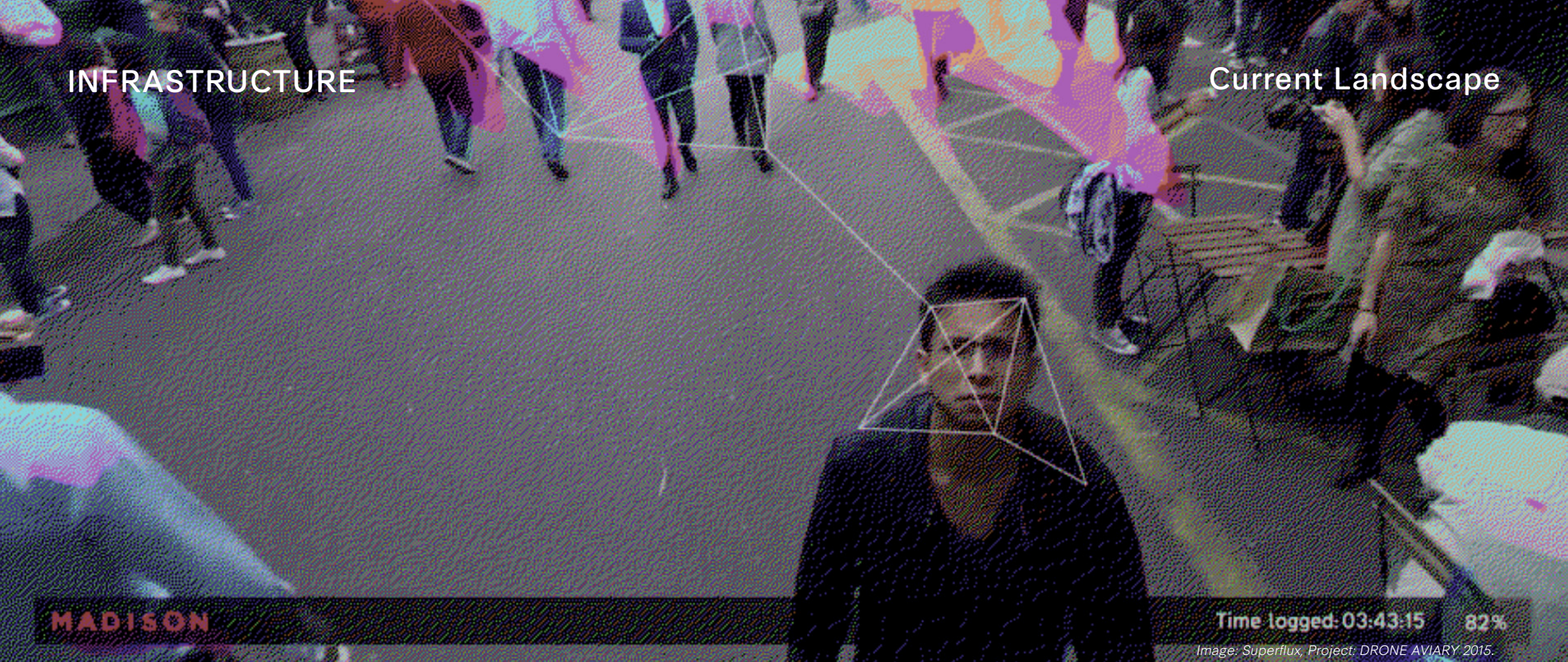
whether it's by playdates, singalongs, religious services and Friday night discos on Zoom; by communities of strangers organising to look after isolated, elderly people on WhatsApp; by the shared endorphin rush of hundreds of thousands of children leaping around to Joe Wicks on YouTube; by the fundraisers running on Facebook and GoFundMe to help out diverse causes from individuals in financial hardship to the CDC Foundation; and the last goodbyes said via FaceTime.

"They [elderly parents] can contact you without moving from their chair and you can drop in to check they are ok. Most of us with elder parents know they are unreliable at keeping the control on them [for emergency button to social services] so just being able to call out and Alexa hear them is great." — Anita

PROGRAMMABLE CITIES

A popular trend within the concept of civic infrastructure is that of the smart city; using networked, digital technologies to control infrastructure, deliver and manage city services and systems. This potentially invites a future of ambient interfaces; not just personal computers and screens, but public, multi-user displays, second-screen interfaces, things running continually in the background, push notifications and public announcements, televised forecasts – all pushing responsibility for risk management and situational awareness back onto individuals.

"The risks of smart cities are that they may lead to more privatization, walled gardens and public spaces that are not really public [...] You see

40

this trend in cities across Africa, sometimes it's just one compound after another."— **Digitisation & Smart Cities Lead, UNDP**

Unfortunately such visions of smart cities reduce cities to 'user needs' and 'tasks that need to be completed', and are programmable and can be rational, rather than a more holistic view of individuals' wellbeing: what are the ethical and social needs?

LOCALISM

Helena Norberg-Hodgrise calls for a structural shift in the current economy – away from dependence on a corporate-run global marketplace, towards diversified local systems that support communities and rebalance dying ecosystems. Professors Samuel Bowles and Wendy Carlin cite civil society as a source of "reciprocity, altruism, fairness, sustainability, identity" today.

There is a new wave of civic collective action adapting to digital systems, where local actors are leveraging civil society framework to bring relationships between actors in a democratic environment to a more equitable level. The COVID-19 pandemic has fast-tracked many such activities and Jack Orlik recently drew up a A/B list around competing philosophies to manage the risks of the pandemic, which shows different approaches to risk and responsibility.

We are seeing signs that civil society is playing a much stronger role to form digital social contracts safeguarding public spaces and social norms. This can be seen in initiatives like Alphabet's Sidewalk Labs pulling out of their plans to develop 12 acres of waterfront in Toronto, Canada, into a 'smart city', citing economic uncertainty – though they also experienced substantial pushback

Four ways for society to respond to Covid-19

Prescription
(restrictions imposed by government)

Regulated self- reliance
"stay alert & exercise common sence"

- Emphasis on individual responsibility and self protection
- new regulations and laws applied to enable informed risk-taking

Technocratic paternalism
"Following the science"

- Government imposes restrictions on movement for the 'common good'
- Technology is applied to control the pandemic, but at a cost of personal privacy

Individualised
(emphasis on responsibility for self)

Collectivised
(emphasis on responsinility for others)

Uncostrained individualism
"Liberarte"

- Idividuals and businesses are responsible for their own welfare, with little government
- intervention

Community control
"Clap for our carers"

- Social respomsobility of citizens to control the virus is emphasised
- New social norms develop that encourage community action; those who do not conform are censured
- Governments ans businesses invest in social resilience
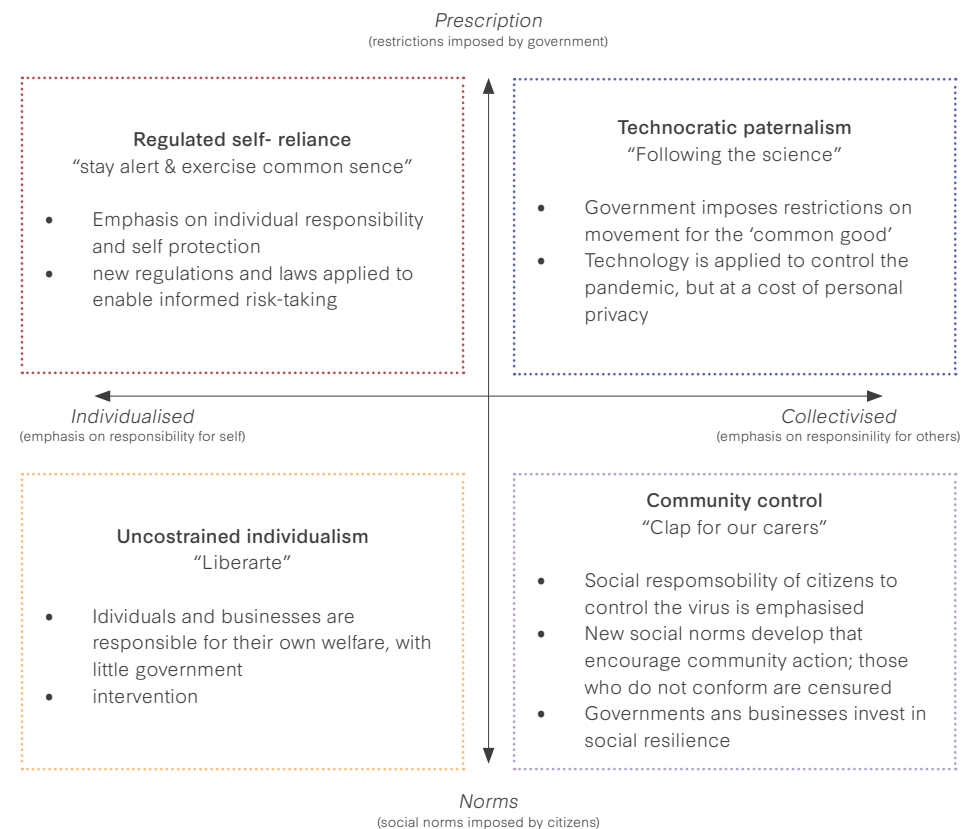
Norms
(social norms imposed by citizens)

Diagram: Based on Duglas & Wiladavsky/s Grif/Group Typology. @JackOrlik

from civil society advocates, and may have been unprepared to engage with local regulations conflicting with the ambitions of the initiative.

The Glimmers Project is pushing us to ask questions that go to the heart of what a digital civil society structure might look like: How can civil society support more people in a world where technology both individualizes and connects individuals, families, workers, learners and whole communities?

ALTERNATIVE ECONOMIC MODELS

The development and uptake of ambient technologies are inextricably linked to the business and economic models within which they are produced, marketed and used. If we talk about civic infrastructure and how ambient technologies can better support civic infrastructures of care, then we have to closely observe current business models, and actively propose alternatives.

a) STATE INVESTMENT IN PUBLIC WELFARE

Mariana Mazzucato and Gregor Semieniuk give evidence showing that private finance has "increasingly retreated from financing productive activities" in support of civic good, because of short-termism, resistance for structural change from unwieldy corporate bureaucracies, and big drivers of change that favour exponential growth. However, the current large-scale public health crisis has clearly highlighted what was evident even before; that there is a clear need for increased public investment in innovation that benefits community care, support and resilience.

Public funds for public welfare is the rallying cry from Mariana Mazzucato:

"Public actors are forced to emulate private ones, with their almost exclusive interest in projects with fast paybacks. After all, price determines value. You leave the big ideas to the private sector which you are told to simply 'facilitate' and enable. And when Apple or whichever private company makes billions of dollars for shareholders and many millions for top executives, you probably won't think that these gains actually come largely from leveraging the work done by others – whether these be government agencies, not-for-profit institutions, or achievements fought for by civil society organizations including trade unions that have been critical for fighting for workers' training programmes." **— Mariana Mazzucato, The Value of Everything: Making and Taking in the Global Economy**

b) DE-GROWTH

From Donella Meadows' 'Limits to Growth' (1972) to E. F. Schumacher's 'Small is Beautiful' (1973), to recent works of Holly Jean Buck ('After Geoengineering', 2019), many economists and scholars have challenged current dominant paradigm based on constant consumption as a sign of a better standard of living. They have called for alternate economic models that promote better care, maximise well-being and reduce consumption.

The focus of this work is that innovation investment and efforts from ambient technology producers should focus on infrastructures of civic care, community, autonomy, self-organisation, localised production and conviviality, enabling a socially just and ecologically sustainable society with well-being as indicator of prosperity instead of GDP.

"The world's leaders are correctly fixated on economic growth as the answer to virtually all problems, but they're pushing it with all their might in the wrong direction." — **Donella Meadows, Thinking in Systems**

c) DOUGHNUT ECONOMICS

In her book 'Doughnut Economics: Seven Ways to Think Like a 21st-Century Economists', Professor Kate Raworth provides an economic framework for sustainable development, allowing cities and states to thrive within their ecological means. "I want to see more regenerative economies, far more distributive economies," she says. This model is currently being piloted by the City of Amsterdam.

d) CIVIC FINANCE

Nathan Schneider's "exit to community'' is a new exit route for startups, where companies could transition from investor ownership to ownership by the people who rely on it most. The mechanism for co-ownership might be a cooperative, a trust, or even crypto-tokens. Civic Capital is also a host of new system financing tools and models that redistribute wealth across communities and build civic assets for our current and future commons and collective wealth.

e) UNIVERSAL BASIC EVERYTHING

The concept of Universal Basic Income has trialled in different forms around the world. Findings from a recent trial in Finland suggested that although there was minimal impact on the employment levels amongst participants, the economic benefits of such a scheme could come from the significant

increase in the wellbeing of participants. Among other factors, the program increased life satisfaction and less mental strain was noted. Elsewhere, Spain, Italy and Portugal's foreign ministers have issued a joint call for a European Basic Income as part of pandemic recovery efforts, and there is a suggestion that Scotland could also adopt a version of UBI.

Several projects and programs are also reimagining Universal Basic Income (UBI) for different contexts, acknowledging that there is no universal homogeneity and that the value of money differs depending on context and individual circumstances.

For instance, the idea of Universal Basic Everything is being explored at local community level in the London Borough of Barking and Dagenham. As Tessy Britton, Chief Executive of Participatory City Foundation, writes, "Universal Basic Everything is the idea that there are systems, tangible and intangible, that we need to survive and thrive. These relationships and friendships, products and services need to be co-created, accessible to everyone, open source, simple in their design, circular in their production."

In critique of UBI, Max Borders offers the idea of Distributed Income Support Cooperatives (DISCs), a decentralized way of coordinating mutual aid (upgrading traditional welfare).

What if we were to decouple public investment in civic infrastructure from current economic models of speculative financing and stock market trading? If services used by the public were not provided by private companies through competitive bidding, if land used by the public was not part of a housing market bubble, if data we produced whilst using civic services was not monetized?

PHOTO: Superflux, Project: DESIGN FUTURESCAPING 2012.

COMMUNITY LED AND OWNED CIVIC INFRASTRUCTURE

What if curated citizen collectives could plan and co-own our civic infrastructures? There are some initiatives that move in this direction already, such as Community Shares or Cooperative Investment Funds, and there is a rise in community land trusts that help permanently affordable housing.

The acceleration of the development of infrastructure that works for more communities or at a local level will change how we define our communities; relationships between them and between individuals within them. We are already witnessing how the COVID-19 pandemic is challenging the social contract and the civic fabric connecting people. Can new forms of civic engagement, mediated by ambient technologies, provide new ways of belonging? How can we reimagine structures and enable environments that can foster connection?

RELATIONAL IDENTITIES

Design and deployment of products and services around ambient technologies co-developed by communities could influence the type of information shared, and data collected, which in turn could alter how we relate to each other. What if the future saw relational or collective identity systems, where relationships, interactions, and group identities are given priority over the individuals involved? Where greater emphasis was placed on people's roles and actions, and/or on the people's group identities, rather than their unique IDs? What would it look like to design a system that foregrounds relationships or collective identities? How would this change the user experience? What new possibilities or limitations would be available to the designers of such systems?

What if these relational identity systems caused changes in the value of different activities and work, as well as production, reproduction, social reproduction, maintenance, repair, care, household-scale economics?

ERUVIAN AGE

This has the potential to alter the divide of public/private spaces, and could herald the advent of an Eruvian age – a concept that builds on Jewish use of the eruv. An eruv is a religious space within which inhabitants can carry out activities while abiding by the restrictions of the Jewish Sabbath. Imaginary wires define the border and delineate religious from non-religious space.

As journalists Adam Mintz and Kalypso Nicolaïdis explain:

> *"The rabbis teach that in addition to the wire enclosure, each inhabitant had to donate food to a common dish. The creation of the small neighborhood eruv allowed for social interaction and was dependent on the participation of the whole courtyard community... Could it be that we are now learning to treat as private what was previously considered public space, much as the rabbinic eruv has done for the past fifteen hundred years? The model of the eruv and its magical power for observant Jews may yet help secular societies at large think through the complexities of transforming public spaces into safe "user friendly" ones."*
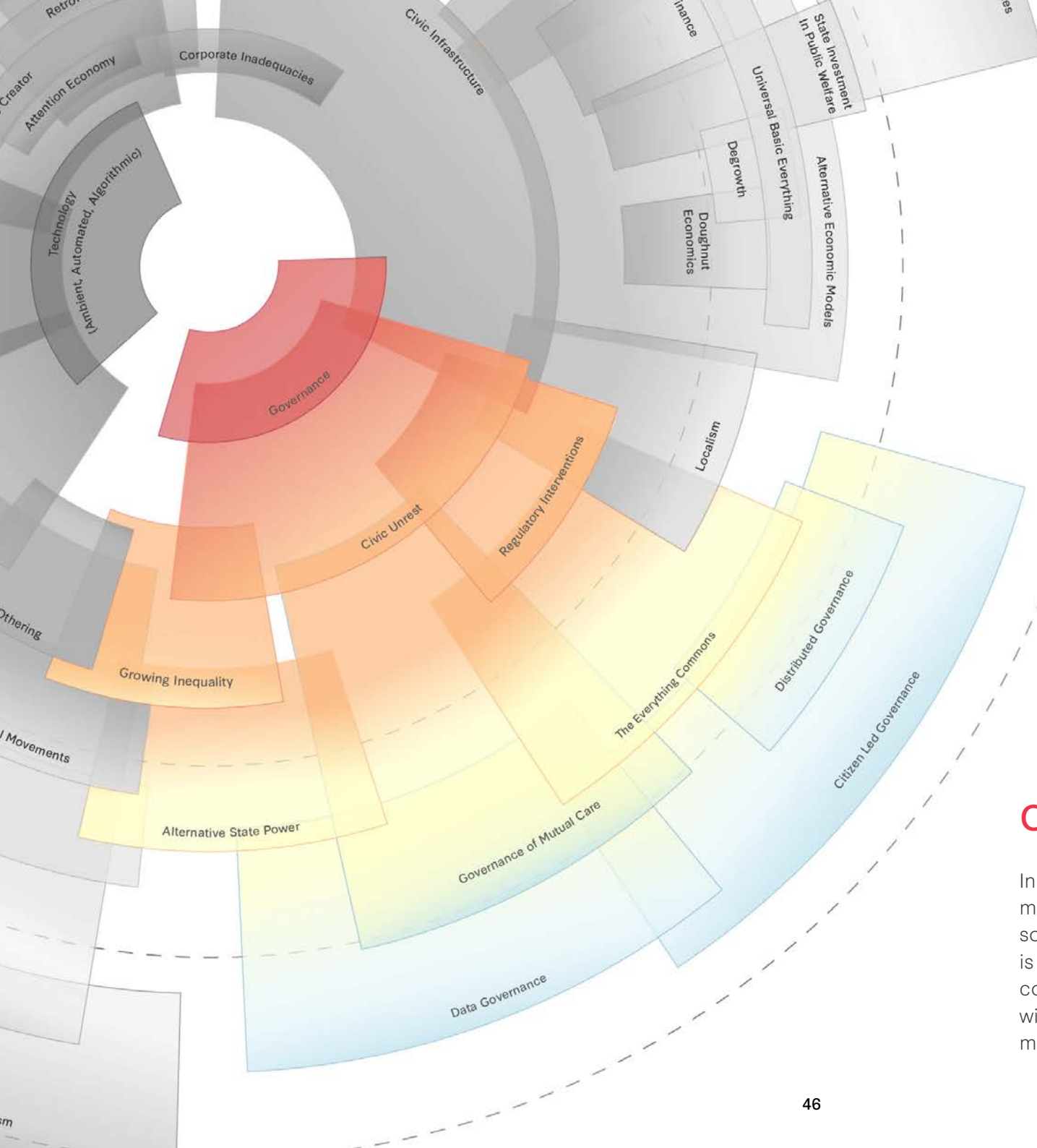
Could the concept of the eruv help us to reimagine the public versus the private of everyday space in our ambient future? An 'Eruvian age' could see the emergence of spaces between the public and the private, a greater gradation rather than a hard either/or binary.

DESIGNING BRIDGES

But this, in turn, raises further questions: how do you know your friends, family, and community members can be trusted? How do you ensure their appetite for risk matches your own? Where do you draw the lines, and how?

In a world of bubbles and narrative breakdown, where are the opportunities to design bridges, convening spaces, or neutral ground?

> *"If we can't take care of each other now, when the world is going to shit, how are we ever going to make it?"* **— Gary Shteyngart, Super Sad True Love Story.**

Retro...
Corporate Inadequacies
Civic Infrastructure
...inance
State Investment In Public Welfare
...es
Creator
Attention Economy
Universal Basic Everything
Degrowth
Alternative Economic Models
Technology (Ambient, Automated, Algorithmic)
Doughnut Economics
Governance
Civic Unrest
Regulatory Interventions
Localism
Othering
Distributed Governance
Growing Inequality
The Everything Commons
Citizen Led Governance
l Movements
Alternative State Power
Governance of Mutual Care
Data Governance
...m

CHAPTER 8: GOVERNANCE

In this section we explore how alternative governance models can shape stronger communities and civic society. We cover ground about how today democracy is being challenged, and how state power is getting concentrated, how non-state actors (corporations) are wielding power, and what are the alternative, emerging modes of governance coming up.

PHOTO: Randy Colas

PHOTO: Randy Colas

CIVIC UNREST

The questioning of democracy had already started long before the COVID-19 virus swept across the globe, with large scale protests across US, Spain, UK, Mexico and many more places around the world; according to one count, there have been about 100 large anti-government protests since 2017 to time of writing (June 2020), from the Gilets Jaunes riots in France to demonstrations in Bolivia. With the COVID-19 pandemic, such unrest could intensify, and even lead to social revolutions, as Andreas Kluth suggests in Bloomberg Opinion.

The growing civic unrest around the world, from Hong Kong to Beirut and Cairo to Minneapolis and New York, is hitting financial markets, which may in turn amplify the unrest. According to a January 2020 study by socio-economic and political analysis firm Verisk Maplecroft, up to 40% of countries could see civic unrest in 2020. The report's authors are quoted as saying that, although each country's turmoil is unique, there are similar grievances that are driving them: "These include stagnating incomes and rising inequality in the decade following the global economic crisis, the loss of trust in traditional political elites, corruption, and the erosion of civil and political rights."

The Salvage editorial collection, who proclaim themselves to be from the 'desolated Left', wrote in May 2020 regarding Covid-19, "The danger is that

governing paralysis, soaring unemployment and poverty, and growing state authoritarianism will create fecund ground for forces well to the right of Trump, Johnson and Bolsonaro." As a counterweight, we note how Black Lives Matters protests in the United States and internationally have rapidly created not just awareness but popular support and targeted political lobbying for radical left ideas of defunding and even abolishing the police. In turbulent times, the ground is fertile for movements at both ends of the political spectrum, with political polarisation a continuing social force.

GROWING INEQUALITY

The world's wealthiest individuals, those owning over $100,000 in assets, total only 8.6 percent of the global population but own 85.6 percent of global wealth. Disproportionate wealth in society is one of the root causes for the growing fragility of many fundamental civic society structures: labour, race, education, healthcare and more. Automation technologies – machine learning, advanced robotic sensors, AI, the growing internet of things – produced, designed and marketed by those who own such wealth continue to favour their interest and perpetuate inequality.

In response, movements like Resource Generation argue for a redistribution of wealth, land and power from classes of privilege towards the under-privileged,

in order to support intergenerational social justice and solidarity. And the Algorithmic Justice Movement helps citizens voice their concerns and experiences with algorithmic bias.

REGULATORY INTERVENTIONS

Current instruments of governance such as regulations, bills and legislation that enable states to govern better are not able to keep up with the pace of technological change and growing uncertainty.

Several groups and organisations are making active efforts to propose alternate, updated models. Omidyar Network's report on the Public Scrutiny of Automated Decisions, and Doteveryone's proposal for responsible technology and the system of regulation needed to achieve such accountability, are important work for current and future ambient technology producers. The AI Now Institute does critical research around the implication of automated technologies and artificial intelligence on human rights, labour, bias and safety infrastructure.

Kate Crawford writes in an opinion piece in the New York Times, "Histories of discrimination can live on in digital platforms, and if they go unquestioned, they become part of the logic of everyday algorithmic systems."

Some emergent trends and weak signals that we need to reckon with include:

ALTERNATIVE STATE POWER

This crisis has foregrounded the interconnected challenges of fragile states (failing economies, impending climate crisis, growing unemployment and citizen disenfranchisement) and made a strong case for exploring alternative forms of governance that challenge present day capitalist models.

We already see a rise in such alternative forms of governance: from The Alternative Party in Denmark promising a serious sustainable transition, a

new political culture and the entrepreneurial creative power of society and individuals; to the Pirate Parties International who advocate for the protection of human rights and fundamental freedoms in the digital age, support of information privacy, transparency and free access to information.

GOVERNANCE OF MUTUAL CARE

Whilst it was obvious even before the COVID-19 pandemic, the crisis has made it crystal clear: infrastructure of mutual care matters over and above everything else, and ensuring that these infrastructures are nurtured, supported and actively managed is critical. Indy Johar suggests that, "At its core, governance should provide a framework for the creation of public value and preservation of the public good along with the necessary infrastructure and trust for massive collaboration."

How do you build trust into business and governance models? Mutual aid infrastructure is trusted in anarchist organisations, but what would it take to build this in other organisations?

As Professor Shannon Mattern asks, "If we were to de-grow a digital universe monopolised by Alphabet and Verizon, how might we start to repair the vast disparities in informational resources and sustain widespread — and critical — digital literacy? How would we build and maintain infrastructures that promote community-responsive connectivity? How can we develop regulations and digital pedagogies that prioritise 'sharing', 'simplicity', 'conviviality', 'care' and 'commoning' above growth?"

THE EVERYTHING COMMONS

For the people, with the people, by the people is the ambition of those who advocate for the creation of Commons across technology, politics, environment and rights. In order to make these spaces more equitable and connected, organisation Reimagining the Civic Commons believes that the community should have a role in designing, managing and operating them.

Dark Matter Laboratories suggest that a 'Smart Covenant' is needed to do this; harnessing emergent technologies to create new methods of investment for community-led urban development. For example, "For those who own property, a digital property deed could link the investment in a new project to equity in their home, allowing homeowners to exchange a portion of equity to cover the investment without creating huge amounts of paperwork or legal costs." Our digital resources, knowledge repositories and data, can be built and managed by communities who govern the way the information is collected, stored and used – a digital commons. As ambient technologies change the way we consume information, could we see new forms of digital commons emerge?

DISTRIBUTED GOVERNANCE

Cryptocurrencies, blockchain, and alternate forms of organisations such as DAOs (Decentralised Autonomous Organisations), are built on the promise of trust, accountability and decentralisation — and several states and private entities have actively promoted their use for the last few years. The Distributed Cooperative Organization (DisCo) model challenges DAOs, by exploring open distributed cooperatives enabling anyone to join without monetary incentives,

but with a focus on allowing workers to mutualize their skills while identifying value flows, making care work visible and creating plurilingual commons.

Indy Johar asks, What would a new governance model look like if it were to "acknowledge our global interdependence at all scales [and focus] on the quality, diversity and integrity of feedback in all its natures, whilst recognising that the future is real time and negotiatory?"

The speed of technological innovation and social change is much faster than the state's means to regulate, and therefore current day models of governance will need to be reimagined.

CITIZEN-LED GOVERNANCE

What if the future was led not by state or private actors, but led foremost by citizens, for citizens and with citizens? What governance models will enable such a radical transition?

In order to explore such a transition, business models will need to be structurally reimagined, and the civic, public, common interest would need to be valued over private economic growth.

Innovation for growth through competitive means would need to give way for collaborative programs that focus on innovation for care, conviviality, and maintenance. From open source supply chains to product provenance and regulatory cooperatives, there are several opportunities to conduct better governance experiments.

Some initiatives in these directions include; Participatory Governance, which enables processes that reduce barriers to people participating in public decision making in order to tackle 'democracy deficits' and improve public accountability; and collective ownership initiatives, such as REScoop.eu, a European federation for renewable energy cooperatives.

DATA GOVERNANCE

Many of the current ambient technologies are ultimately rooted in the capture, colonisation and monetisation of data that we create via use of the platform or the technology. How can we think differently about the governance and ownership of both data and data infrastructure? Are there different ways of conceiving of the infrastructures that sit behind these vast engines of capital accumulation?

This level of reimagining of governance is a systems level transition. It will require constant sensemaking, acknowledgement of complex, interdependent systems, and the openness to test emergent strategic options for change through deliberate experimentation.

CHAPTER 9: PLANETARY

This section zooms out and brings the planetary-scale challenges we face into focus. It is important to consider this scale because the infrastructural terraforming being carried out for ambient technologies will influence and shift our ecological infrastructures in unprecedented ways.
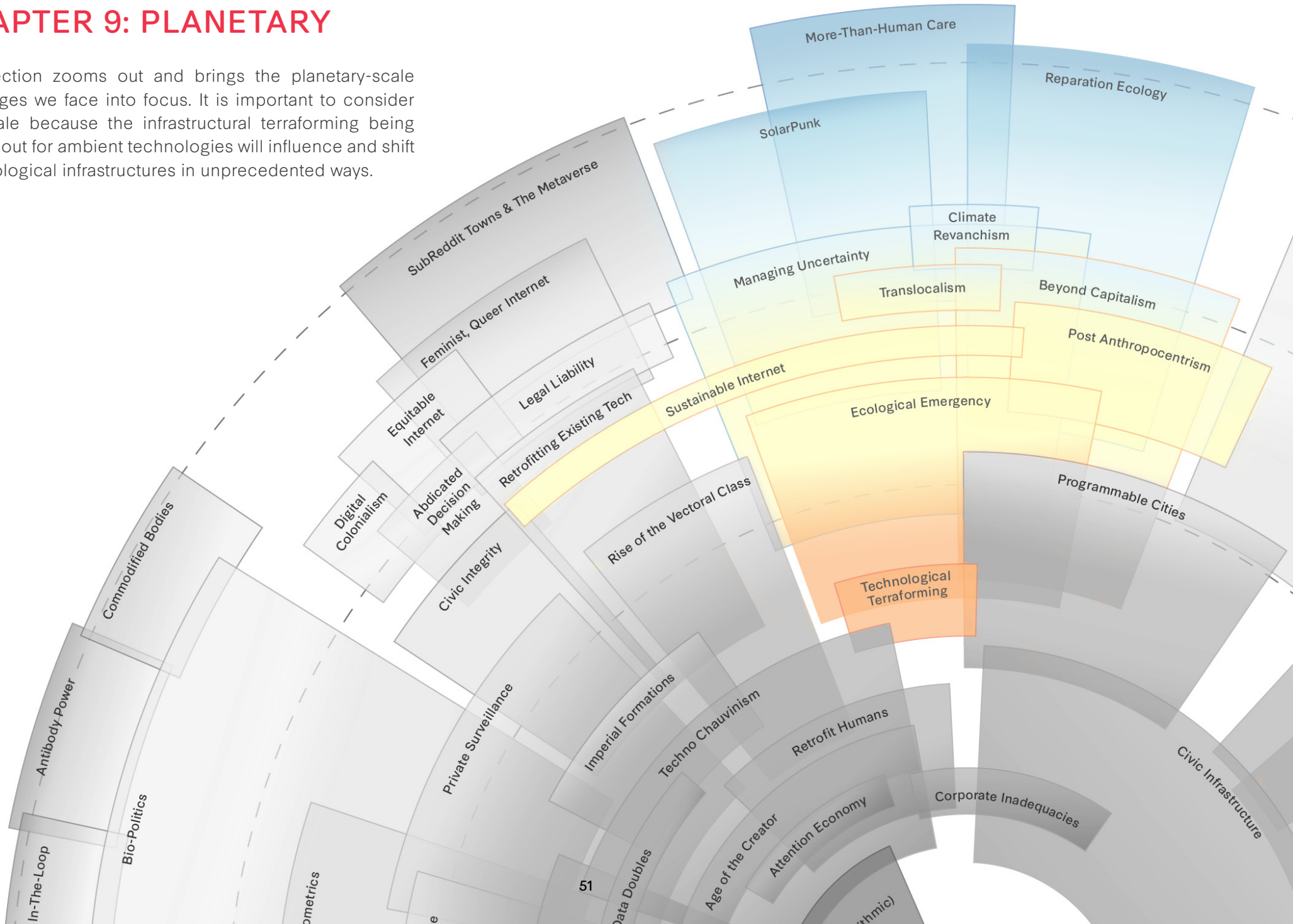

More-Than-Human Care

Reparation Ecology

SolarPunk

Climate Revanchism

Managing Uncertainty

Translocalism

Beyond Capitalism

SubReddit Towns & The Metaverse

Post Anthropocentrism

Feminist, Queer Internet

Legal Liability

Sustainable Internet

Ecological Emergency

Equitable Internet

Retrofitting Existing Tech

Digital Colonialism

Abdicated Decision Making

Rise of the Vectoral Class

Programmable Cities

Civic Integrity

Technological Terraforming

Commodified Bodies

Private Surveillance

Imperial Formations

Techno Chauvinism

Retrofit Humans

Civic Infrastructure

Antibody Power

Bio-Politics

In-The-Loop

Data Doubles

Age of the Creator

Attention Economy

Corporate Inadequacies

IMAGE: *Smoke billows from wildfires on Australia's Kangaroo Island. Donna Lu*

ECOLOGICAL EMERGENCY

We're not only living through an ecological emergency – we are the cause of one. Human activity is heating the planet and bringing about a sixth mass extinction, pushing the climate into dangerous, uncharted territory with perilous implications for life on Earth. We are already reckoning with the consequences, from Indonesia moving its capital city because Jakarta is sinking, to dramatic decreases in populations of wildlife (an average decrease of 60% over 40 years), and increases in the number and severity of wildfires in California and Australia.

Grassroots movements such as Extinction Rebellion are calling for governments to "Tell the Truth" and "declare a climate and ecological emergency". They emphasise the urgency of the climate crisis and provide a collective body through which people can raise their voices up and participate in activities opposing the degradation of the natural environment. Although Extinction Rebellion practice nonviolent civil disobedience, the position that they have taken led them to be placed on a list of extremist ideologies by the UK counter-terrorism police.

TECHNOLOGICAL TERRAFORMING

The scale of terraforming across the planet in the service of technology is mind boggling. From vast storage capacities of data server farms to factories for manufacturing digital goods, 5G towers, and extractive mining, the infrastructural scale of ambient technologies is directly affecting our planet's future.

Shannon Mattern reminds us that tech companies are not purely digital enterprises but extractive ones, and as such plans to address this damage cannot operate only in terms of personal activities, but at infrastructural and ecological scales. She calls for expanded conceptions of maintenance and care to address this:

"Facebook, Apple, Amazon, Netflix and Google depend as much on the extraction and the expenditure of environmental resources as any other growth-oriented industry. By that same token, their "limits to growth" will, similarly, confront us on our city streets, our coastlines, and our farm towns, on private properties and in the commons. As we contemplate legal, economic, and ethical strategies for limiting tech's rampant growth, we need to look beyond privatised and individual solutions like setting

IMAGE: *Crescent Dunes Solar Energy Project Tonopah, Nevada, US. PHOTO: JAMEY STILLINGS*

"screen-time limits" or quitting Facebook. As with other degrowth endeavours, we need to strategise at the community, national, infrastructural, and ecological scale — and to acknowledge the crucial importance of maintenance and care at each of those scales."

New narratives and weak signals that suggest ways our relationship with the climate and natural world may be changing include:

POST ANTHROPOCENTRISM

"What if we deny that human beings are exceptional? What if we stop speaking and listening only to ourselves?" — **Anne Galloway, Associate Professor, School of Design Innovation, Victoria University of Wellington.**

Multispecies ethnographers, climate scientists and ecologists, amongst others, are calling for a shift in our human perspective, to understand the unity and interdependence of all living things. Without the earthworm or the mycelium, the wolf or the bee, we will not have the habitat needed to survive as a species. Without this shift in perspective, no societal transformation is possible. And today, amid a pandemic, this intertwinement of our lives – human, plant, animal – has become more apparent than ever before: our lives trace through other beings, and their lives trace back through ours.

Professor Anne Galloway reminds us "to take seriously Todd's (2016) reminder that these dreams are not new, that Indigenous (and other oppressed) people

have been 'dreaming of an otherwise' for hundreds of years." Metis scholar Dr Zoe Todd writes to remind a settler audience and Western theorists excited by these notions of non-human entanglements that Indigenous thinkers have been engaging with these idea for literally "millennia", through "engagement with sentient environments, with cosmologies that enmesh people into complex relationships between themselves and all relations, and with climates and atmospheres as important points of organization and action." She wants us to find value from these ideas, but to acknowledge Indigenous sources "directly, unambiguously and generously. As thinkers in their own right," and not just to further "European intellectual or political purposes."

Moving away from placing ourselves at the centre of narratives will aid our understanding of our interdependence, not only with the natural world, but with non-human entities – the increasingly autonomous computational systems that we have created in order to master the world. The machines that we have created are also remastering us: our politics, the way we relate to each other and the world around us.

Ursula Martin evocatively explores these ideas in her piece Thinking Saltmarshes through the lens of situated thinking machines and ecological/landscape-scale AI; designer Matt Jones explores tightly coupled human-AI systems as Centaurs, inspired by Gary Kasporov; and science fiction writer Karl Schroeder uses 'thalience' to label attempts "to give nature a voice without that voice being ours in disguise." These directions challenge the anthropocentric position of ambient technologies and present radical alternatives to how such technologies could be considered.

BEYOND CAPITALISM

Our current consensus reality promotes the idea of 'growth' in a way that suggests a linear and infinite progression, which clashes with the reality of our planet's finite resources. Increasingly scholars, activists and governments are considering post growth economic models. New models are emerging that centre the challenges of climate change, and human rights, such as Professor Kate Raworth's "doughnut economics" model currently being trialed in Amsterdam City, which acts "as a guide to what it means for countries, cities and people to thrive in balance with the planet."

This framework highlights how our economies are currently not meeting basic human needs, and could play a role in reimagining ambient technologies and their current, planetary-scale visions. We detail these models further in Chapter 7, on Infrastructure.

SUSTAINABLE INTERNET

Every search performed on Google, every Netflix show watched, and every Spotify song played triggers servers to process and output data and then more servers to transmit it, each consuming electricity and thereby burning fossil fuels. With 5G, this consumption is likely to grow.

Yet from the Sustainable Web Manifesto to Website Carbon and The Green Web Foundation database there are various efforts being made to reduce people's digital carbon footprint. Mozilla recently used speculative design and futures to explore the idea of the Museum of the Fossilised Internet "founded in 2050 to commemorate two decades of a fossil-free internet and to invite museum visitors to experience what the coal and oil-powered internet of 2020 was like."

MANAGING UNCERTAINTY

With their baseline calculations broken by the disruptions and non-linear changes of climate change, the finance and insurance industries may look to make substantial investments of their own in independent real-time data and remote sensing systems.

They may also make greater acknowledgement of the complex relationship between uncertainty and quantifiable risk, and expand their capabilities to put more emphasis on qualitative data, human intelligence, and field agents as supplements to quantitative technologies.

TRANSLOCALISM

"Translocalism" is a term from diasporic experience and a concept developed by anthropologist Professor Arjun Appadurai in his 1995 book 'The Production of Locality'. It refers to the condition of individuals having relationships with two or more specific localities (e.g. their place of birth and current homes), linked and sustained not only by social ties, but also the transfer of money in the form of remittances, and by digital platforms.

States tend to view immigration as a question of, how do you rapidly integrate people with particular social norms and experiences into a new local culture and economy? Translocalism challenges this, arguing that these multiple ties are personally and economically valuable, and will sustain. As climate change generates forced climate migration, translocalism is likely to be a significant community structure.

CLIMATE REVANCHISM

According to Dr David Correia, Associate Professor at the University of New Mexico, "The Paris agreement established what he calls "climate revanchism", a total victory for a market-based approach to climate change; the Haussmannization of the climate."

Revanchism (from the French revanche, "revenge") is the political desire to reverse territorial losses incurred by a country, often following a war or social movement. "Climate revanchism", then, is the desire of businesses and governments to make a claim for environmental reforms to operate in capitalist terms. Correira writes that, "We have not moved away from the business-friendly Kyoto Protocols, but instead have allowed capital to stake a permanent climate claim. The Paris agreement does this because it establishes durable private property rights to the atmosphere and sets the conditions for their enforcement."

Climate revanchism may see a counter-reaction in the form of anthropogenic climate change increasingly perceived to be the fault of the rich, developed Global North; rising South-South development assistance; non-cooperation with ex-colonial states; and/or seizure of 'foreign' business assets and infrastructures.

REPARATION ECOLOGY

The term reparations is most frequently used when discussing how African-Americans in the United States should be compensated for historic and on-going social, cultural, economic and political injustices stemming from slavery and the slave trade. The term 'reparation ecology' is used in the book 'A History of the World in Seven Cheap Things', written by justice advocate Dr Raj Patel and environmental historian Professor Jason Moore. It is a concept Dr Holly Jean Buck also discusses in her 2019 book 'After Geoengineering'.

"Reparation ecology is far more than environmental politics plus racial and gender justice. It is a rethinking of what nature, and humanity, and justice means," explains Professor Moore. He and Dr Patel advocate for, "Redistributing care, land, and work so that everyone has a chance to contribute to the improvement of their lives and to that of the ecology around them can undo the violence of abstraction that capitalism makes us perform every day." This proposal envelopes several ideas across this report: from civic commons, distributed cooperatives, participatory governance to degrowth.

These concepts can be cast into the future to ask the question of, how can we become better ancestors for generations yet to come? Projects like Rights for Future Generations are attempting to construct conversations to advance environmental protections for future populations.

IMAGE: ZEARZ.

SOLARPUNK

"Solarpunk encourages optimistic envisioning of the future in light of present environmental concerns, such as climate change and pollution, as well as social inequality," writes strategist Adam Flynn. To members of this creative, post-sci movement of literature, art, architecture, and fashion, "Our future is about repurposing and creating new things through what we already have (as opposed to 20th century "destroy it all and build something completely different" type modernism). Our futurism is not nihilistic like cyberpunk and it is not quasi-reactionary a la steampunk–it is about ingenuity, positive creation, independence, and community."

Solarpunk is often seen by its advocates as a response to and a successor of cyberpunk. According to Andrew Hudson from Arizona State University's Center for Science and the Imagination: "Solarpunk is about the green technology revolution. Cyberpunk is dark, and chrome, and covered in latex. Solarpunk is sunny and leafy, and dressed in [hemp canvas]. Cyberpunk is gritty, solarpunk is plucky."

The premise of Solarpunk is very relevant due to the fact that the idea of decoupling progress and growth has been recurrent throughout this report: as Flynn writes, "Progress/development is not the same as growth, and an integral thesis of solarpunk should be about decoupling the first from the second. More is not better."

HUMAN	MORE-THAN-HUMAN
Fixing	Caring
Planning	Gardening
Producing	Engendering**
Innovation	Resurgence*
Growth	Nurture
Certainty	Contingency
Nodes	Knots*
Systems	Assemblages*
Global	Terrestrial**
Independence	Interdependence
Extinction	Precarity*
Anthropocence	The Dithering***

*ANNA TSING **BRUNO LATOUR ***KIM STANLEY ROBINSON

MORE-THAN-HUMAN CARE

What if our governance structures invited not just governments but also citizens, non-humans, trees, animals, and landscapes to become multiple stakeholders? There have been some recent moves towards non-human personhood: in 2017 New Zealand recognized in law what Maori had known for hundreds of years: the Whanganui River was a living being, and should be granted legal personhood.

In the face of increasing climate challenges, and with the rise of alternative governance and economic models, we have the opportunity to look at a bigger picture, to move beyond established 'user-centred design' narratives used in current technological development and embrace "more-than-human" centred approach, where humans are not at the centre of the universe and the centre of everything; where we consider ourselves as deeply entangled in relationships with other species and non-human entities.

Superflux's proposal of a More-Than-Human Politics Field Guide explores such an approach further:

"By seeing the self not as an individual hero, but as one among many — human and non-human — a new kind of tentacular, multi-kind, multi-species politics of care might emerge. A politics which does not rely on oppositional, binary, artificially constructed world views, one that is not obfuscated by the right and left or the neoliberals and communists, or whatever it is that you choose to follow. A politics that gives us a new kind of relational agency to help us imagine alternatives for living with and through global warming. A politics which allows us to invent new practices of more-than-human care, humility, imagination, interdependence, resistance, revolt, repair, and mourning."

CHAPTER 10: SCENARIO PATHWAYS

Legend:
- Current Landscape
- Emergent Directions
- Future Extrapolations

Diagram axes: Inclusive / Polarised (y axis), Public / Private (x axis)
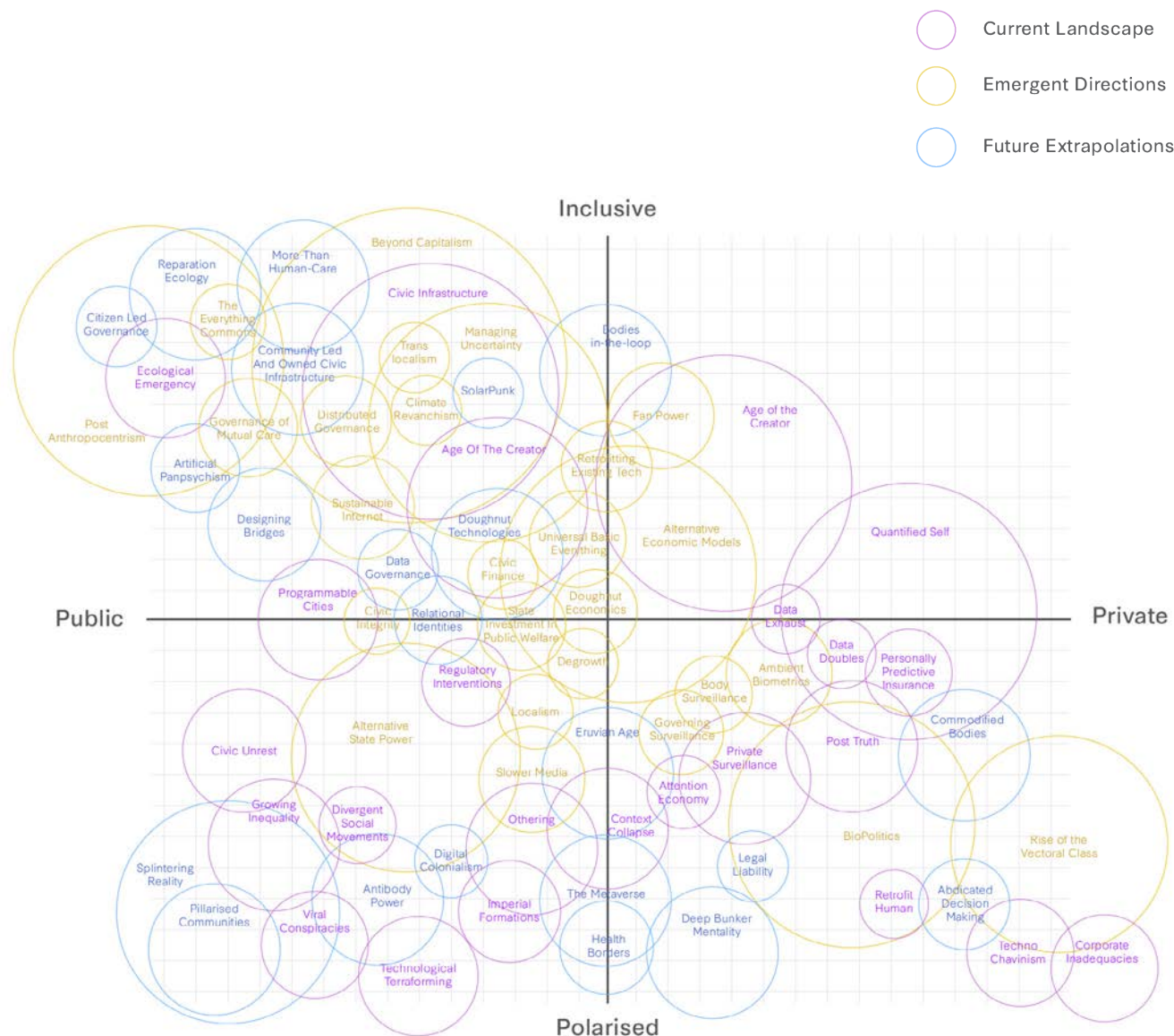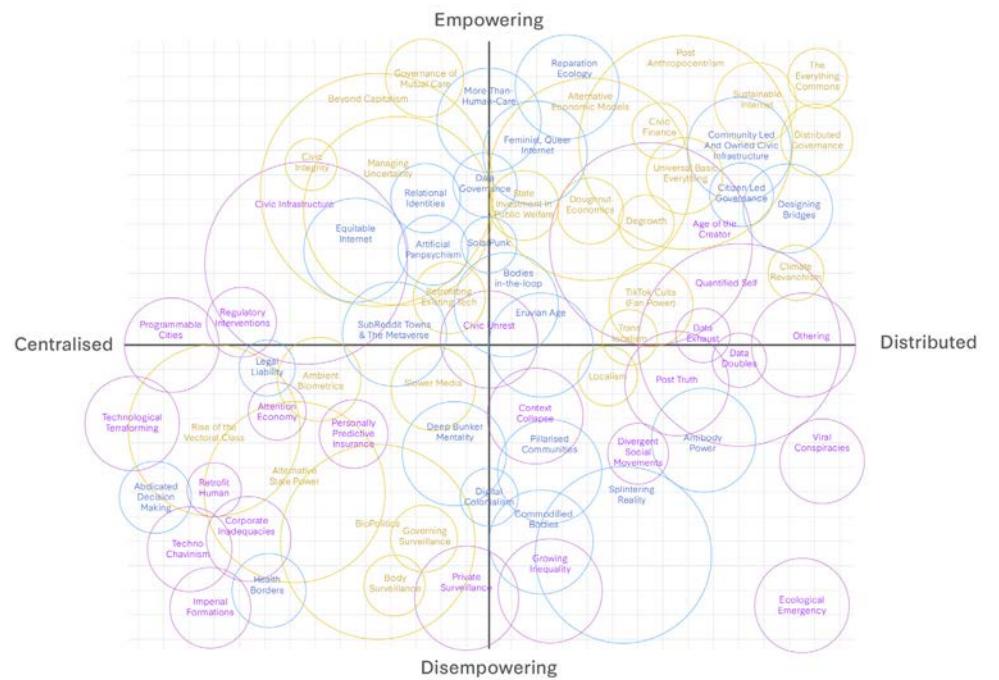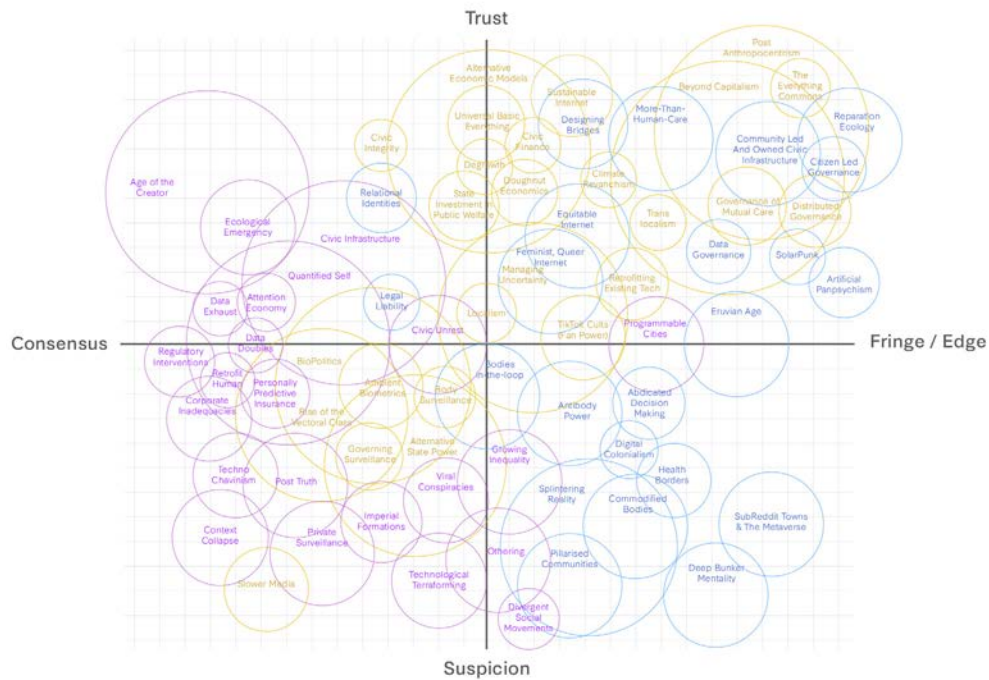
A useful way of translating insights from such a rich sensemaking activity into future scenarios is the widely-used four-quadrant scenario planning method. It is usually based on weighing the potential outcomes of a pair of uncertainties. Using a four-quadrant diagram with the two uncertainty dimensions gives us four distinct 'what if' scenarios.

We have chosen to plot the quadrants along a value (y axis) and a function (x axis) in order to embed ethics into the process from the beginning, rather than creating a scenario and then thinking about ethics. We see these quadrants as an agile tool, enabling internal Omidyar Network teams to rapidly generate pathways, on a continuous basis, in order to foreground multiple possible futures, and as an inspiration for Superflux to develop design-led speculative and provocative futures.

However, in our practice at Superflux, we have found value in combining, building up and creating complex worlds, with interconnections, interdependencies, winners and losers, rather than breaking down into smaller scenarios. When it comes to world building, we synthesise multidimensional views and perspectives through analysing and recombining insights to create rich future tapestries.
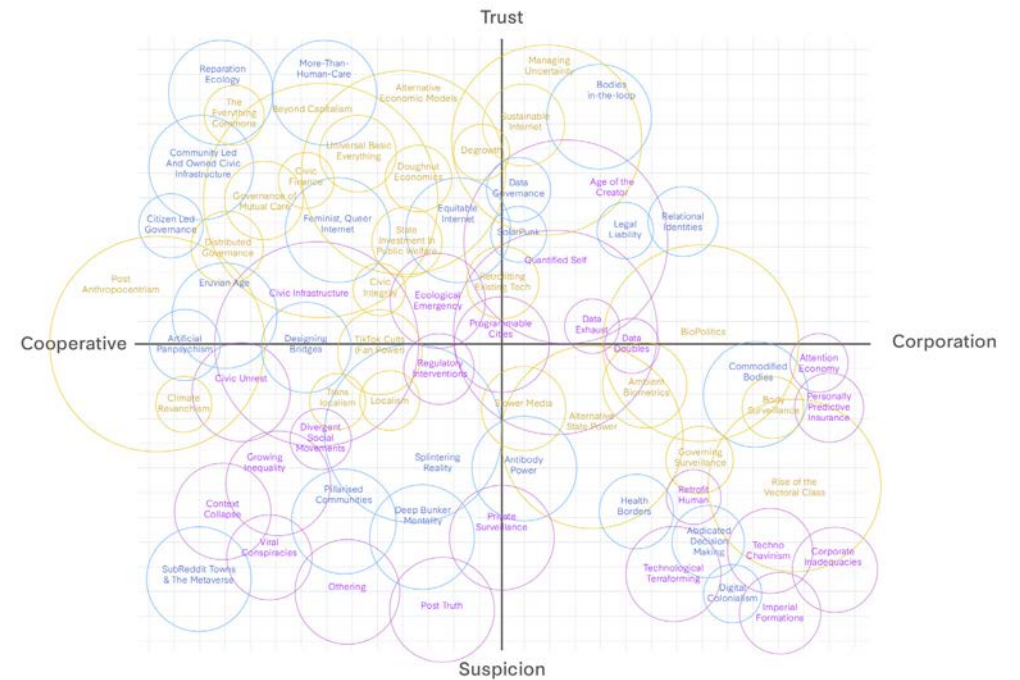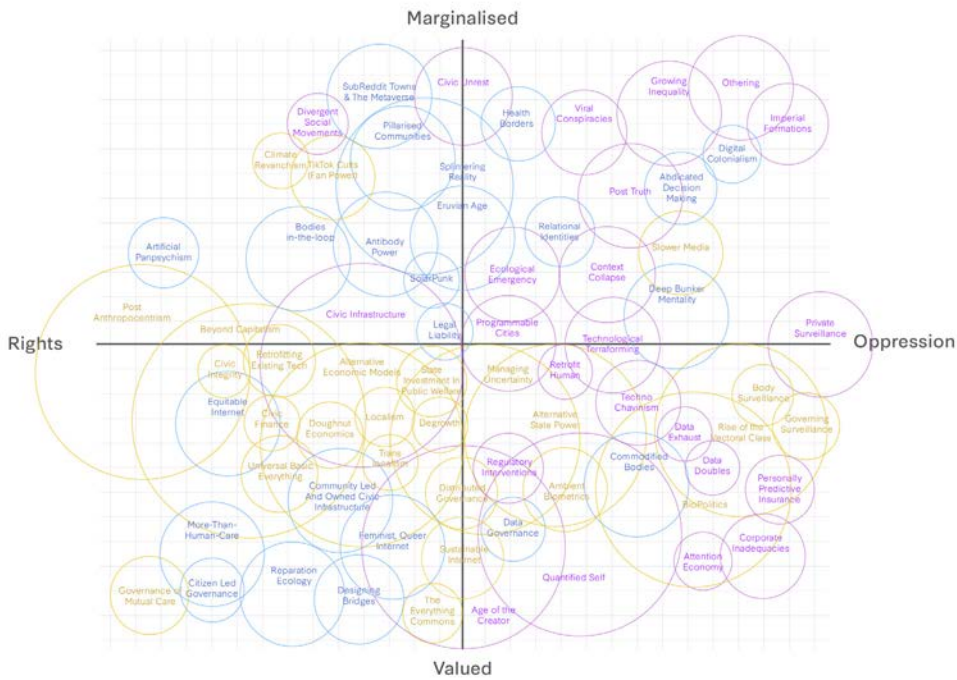
We will bring tools and capabilities that enable such multilayered futuring to the next phase 'DESIGN FUTURES' of this project.

SCENARIO PATHWAYS

Current Landscape

Emergent Directions

Future Extrapolations

SCENARIO PATHWAYS

Scatter plot (left) with axes: Marginalised (top), Valued (bottom), Rights (left), Oppression (right).

Scatter plot (right) with axes: Trust (top), Suspicion (bottom), Cooperative (left), Corporation (right).

Legend:
- Current Landscape
- Emergent Directions
- Future Extrapolations

Today, we are in-between worlds, a time of unfolding uncertainty. What was previously considered impossible is now our day to day reality. As we have seen with COVID-19, the impact of such crises do not stick to a single domain but ripple out across our lives in ways that do not respect physical or conceptual boundaries. What we are now seeing across our health, economic, education, social and systems is just a glimpse of the potential impact of the impending climate crisis.

It has become clear that imagining plural and hopeful visions of the future requires an open view towards an altered state of reality and of 'un-measurable' uncertainty. And that is what we want to demonstrate in this report. Although we started by charting threads of nested trends and signals across technology, civic infrastructure and governance, our critical sensemaking process opened up these frames to include numerous weak signals, provocative ideas and fringe projects to surface the deep connections between what are often considered independent themes.

Alongside the strategic frames required to make long term decisions, we believe that adopting a process of perpetual learning through multilayered research and critical sense-making can endow Omidyar Network with a capability to navigate the complexities of our ever-changing, uncertain times.

We would like to thank Omidyar Network's Future Sensing and Scanning team for give us this opportunity to surface assumptions, to provoke us and each other and take us into uncharted territories.

Anab Jain and Jon Ardern
Superflux

Contents

OBJECTIVES

- Examine which emerging ambient technologies are influencing and impacting our lives, knowingly or unknowingly, and how.
- Explore the principles of ambient technologies embedded in our infrastructures, the benefits and dangers of such practices, and implications for underserved and under-represented communities.
- Understand how such ambient technologies may affect individuals, communities, and society as a whole.

RESEARCH METHODOLOGIES

- Mobile diaries
- In-depth interviews
- Online conversations
- Search analysis
- Desk research

CARRYING OUT RESEARCH DURING COVID-19

The original research plan included:

- 6 to 8 semi-structured interviews at research participants' homes and/or locations they would find most comfortable.
- Vox Pop style interviews in communities, groups and spaces relevant to our research.

In w/c 8 March, we were in touch with over 40 individuals who were interested in participating. In w/c 15 March, as rumours of possible movement restrictions started circulating, many dropped out. This was not only due to difficulties in researchers meeting face to face; many prospective participants were busy preparing for possible restrictions (grocery shopping for their families) or responding to employment uncertainty.

In the UK, movement restrictions were put in place during w/c 15 March, with a formal lockdown implemented on 23 March. We updated our research methodologies to respond to these restrictions.

- We carried video call interviews and mobile diaries. We also encouraged participants to communicate via text and asynchronously.
- We engaged in conversations on forums and social media. These were incredibly insightful.
- We sought the perspectives of informants in our network that work closely with relevant communities and groups.
- We used search analysis tools to support the research.

Short conversations

- Ivetta, age 28, London
- Richard, age 35, London
- Isabel, Croydon College Trauma & Asylum Seeker

Social Media conversations

- Amazon Alexa's Facebook groups (+24k, +40k, +70k))
- SubReddit r/homeless (+23k), r/smarthome (+60k), r/privacy (+733k)
- Covid-19 local council and ward support communities on WhatsApp

Experts and Informants

Umesh Pandya, co-founder of Wayfindr, venture partner
Bethnal Green Ventures Tech For Good

The following sources wish to remain anonymous in the report, but are happy for a direct introduction to Omidyar Network:

- Digitisation & Smart Cities Lead @ UNDP
- Protection Coordinator @ Danish Refugee Council
- Covid-19 emergency response coordination Lead in Palestine

Teko, 26, London

- Law student from Ghana
- Lives on financial support from parents

Teko lives in a student residence in central London where he is completing a masters in law.

He finds new technology interesting but has resigned a lot of it to being unnecessary, and for other people. He also finds it tiring to stay engaged.

Teko is aware of racial bias and security concerns but showed little in-depth knowledge of practical applications. Most of his references were from American television series.

> "I just know about racial biases on Google.. its 2020 you should have enough diversity"

> "When Snap released the location tracking for your friends I thought it was cool and I used it, but now I have ghost mode on all the time."

Kate, 40, Feltham

- Single mom living with two teenage daughters
- She currently lives on financial support

Kate lives in Feltham where she's been living for 10 years. She describes Feltham as "a bit rough".

She previously worked with BA, but suffered mental health issues and was made redundant.

Kate considers herself a big fan of technology, and fears getting left behind.

She feels defeated by how complicated it is to get accurate information online, and is into conspiracy theories. YouTube and Dailymotion are her main sources of information.

> "I don't want to live in the dark ages"

> "I'm interested in race related topics so I get a lot of videos on African history and so on [...] but I'm choosing it. It's not feeding that to me."

Leila, 34, London

- Trans woman living in a house share in London
- She works as a technical director on a VR documentary project.

Leila feels disillusioned about where technology is heading. She was optimistic when she was younger when "there was hope for true democracy".

She prefers creating content to consuming it. She shows a high awareness of privacy and negative implications of technology on society because of her background in political activism.

> Leila thinks "we've sleepwalked into a dystopia", and Covid-19 is the first big event that proves this.

> "I feel hopeless, I've lost faith in humanity, I don't see how there's anyway back. The way data is used today is anti-democratic and anti-freedom."

Karim, 28, Kenya

Raised in Iraq then Sudan before escaping to Egypt and crossing into Israel with his family.

Karim's family still lives in Israel, but he was forced to leave and travel to Rwanda alone. Once there he was scammed into purchasing a fake passport — "I didn't understand the concept of it". He was subsequently jailed before his transfer to Kakuma refugee camp in Kenya.

Through fundraising, Karim was able to enroll into a coding programme and leave Kakuma.

He now lives in Nairobi where he supports software development at an online marketplace startup.

Karim is aware of the idea of government surveillance to control crime and access to public services, but does not see malicious intents behind the apps and websites he uses.

> "Technology plays a big role in my life. Everything I know is through the internet. Through the coding course I learnt how to use it, like wikipedia."

Tahaan, 40, Dartford

- Manages a restaurant
- Lives with wife and 2 young children
- Moved to the UK from Hyderabad 15 years ago

Initially lived in East London where he had a support network of relatives.

Tahaan feels the need to protect his family and provide them with the newest technology.

After working at a gas station near Kent, where he faced discrimination for being "the only Asian around", Tahaan feels one ought to take matters into their own hands. "It was very hard, so many things happened, but I learnt and that made me strong"

He uses unbranded technology as he doesn't trust others to look out for his well being.

> "I want to retire at age 40 and spend more time with family, I want to be remote, get a share from different businesses."

> "So wherever technology is moving, I want to move that way."

Betty, 26, East Anglia

- Has worked remotely for 12 years as a data analyst.
- Lives with husband in an isolated, remote area

Betty uses multiple smart devices and social media to alleviate the feeling of loneliness due to her remote location.

She views YouTube as a tutor and gateway to the world, and used it to learn clarinet and craft skills.

Betty is cautious with personal security as she had her passwords published on breach websites, but doesn't appear to have altered her behaviour.

> "I realised one of my logins might have been hacked, and I use a lot of similar passwords for different logins."

> "In times of loneliness I speak more with Alexa."

James, 28, Leeds

- Works an office management job at a chemical distributor.
- Lives with wife and 2 kids plus 2 step-kids.

James is an avid gamer. He is generally positive views of technology, but also weary after family members experienced fraud and predatory behaviour in online gaming.

He has taken additional steps to secure personal finances, and the experience has made him question future developments like fully autonomous vehicles.

James is concerned about screen time for his children and the needless use of apps. He feels overwhelmed with news.

"I listen to wake up to money on Spotify. It talks about everything that's going on, because if you go looking on the BBC you can get very lost."

"I think as soon as you put any data on a device it's accessible... it's only a matter of time."

Racquel, 36, Bordon

- Lives with her husband and two kids near the M3
- Works part-time as a transport consultant
- Talks about the current challenges of work and home-schooling kids during Covid-19 lockdown

Racquel is always connected. She complained about the time there was no internet in the house — "It was practically impossible. We couldn't go without it" — and uses a range of smart home devices for assistance in domestic life.

She admits she is worried about not paying enough attention to her kids because of screens, and her husband not being entirely 'present', but believes the benefits of technology are greater.

She looks at data sharing and tracking from a security perspective only.

"I don't worry much about privacy and all sorts of things. I have nothing to hide, if they want to view my doorbell footage then go ahead"

Different meanings to being 'disenfranchised'

We came across a range of barriers when it comes to fully benefiting from technological developments:

- Financial
- Knowledge
- Public Services
- Physical
- Legal services

Having the means to access and benefit from new technologies does not necessarily lead to citizens feeling more involved. Even during the recording process, many talked about some degree of discrimination, of feeling left behind, etc.

IT FEELS CHAOTIC

There is difficulty in discerning fake news

- "It's a disaster (...) I don't trust anything anymore. The way data and technology is used today is anti democratic, anti freedom." — Leila
- "It's like a rabbit hole, like now they say do not take ibuprofen if you have Covid or that 5G caused Covid" — James

In the UK, mobile phone masts have been set on fire due to theories linking 5G and COVID-19.

Bias and prejudice are embedded

- "Racial biases on Google.. its 2020. You should have enough diversity." — Teko

Lack of coherence between new services

- "You have so many companies developing the same thing, but they are incoherent. So many different plug systems, every manufacturer has its own ideas." — Racquel

IT FEELS UNREGULATED

Fraud, scams and predatory behaviours

- "You just don't know. So many older people signing up to fake accounts and replying to fake emails (...) my brother had £4K stolen from his account, he was left with no money because he didn't have an emergency account." — James

Most T&Cs are too long and confusing

- "I can't read all the terms" — Teko
- "No one reads the small print" — James
- "I receive so many emails from seemingly official sources like hmrc, apple etc.and they might be but I just delete them. There is too much going on it's hard to tell what is what so I just delete it all." — Tehaan

THERE IS A 'GREAT UNKNOWN'

People don't know what the real implications of their use of technology are

- "I don't know how safe is my data with "them" [when creating accounts online] and how can I be sure nobody misuses it."
- "I don't want to believe that there are people with hoods living in caves controlling us... but a lot of it doesn't make sense to me and the more you learn, the more you know nothing learn you know nothing." — Kate

Availability of new tech is always increasing, but it's hard to catch up with knowledge about how these work

- "I don't understand the depths of I do [my work is related to technology] and I'm more informed than your average person, there is no consent there. You can only consent if you are fully informed."- Leila

NO ONE WANTS TO BE ALIENATED BY TECHNOLOGY

Tech is seen as progress, and the only future we have

- "Hey I'm excited by technology, it's not like I want to live in the dark ages!"- Kate

There is a feeling that there is no choice

- "I think as soon as you put any data on a device it's accessible. You got to accept it."- James
- "When we moved house, we didn't have wifi and 4G initially and we just felt like we couldn't go without it, it was practically impossible. I do feel concerned about the children. I should engage with them actively."
- "I want to go upwards, not go backward […] so wherever technology is moving, I want to move that way." — Tahaan

CONNECTIVITY AND PRIVACY ARE OFTEN PERCEIVED AS OPPOSITES ON THE SAME SPECTRUM?

Many recognise the benefits of connectivity, and these often outweigh concerns over privacy.

- "Days can pass without us seeing anyone so social media is crucial to keeping in touch with others." — Betty
- "It [connectivity and access] allowed me to expand my knowledge and have a career. I learnt everything from internet."- Karim on leaving Kakuma refugee camp and joining a coding course.
- "My mom was so concerned about privacy so made her FB account so private she complained about noone engaging with her. If you want to be part of the community then you have to come out of the shell." — Teko

SOME ARE TAKING MATTERS IN THEIR OWN HANDS AS A RESULT OF DISTRUST IN OTHERS, AND AUTHORITIES

Using an affordable doorbell camera, which starts recording when it detects motion, gives Tahaan peace of mind when his wife and kids are at home.

- "We live on a main road and we used to always have people banging on the door and running away."

PROTECTING OUR MOST INTIMATE SPACES IS PRIORITISED OVER EVERYTHING ELSE, THE IMPLICATIONS ON WIDER SOCIETY ARE OFTEN AN AFTERTHOUGHT

There is a desire to "upgrade" neighbourhoods with more surveillance to increase safety

- "Our neighbourhood is not to safe to walk alone at night especially if you are a woman. This is of course particularly worrying for me and my two girls."- Kate

WE ARE RAPIDLY DEVELOPING A CULTURE OF HOME-MADE SURVEILLANCE

Families are creating their own safe havens through low cost smart devices.

- "Just given where we are, it's not as overlooked, it gives that added reassurance, you can answer the doorbell without being at the door , you can view who's at the door." — Racquel
- "We had a girl look after our dogs once and when I later went through the cctv I realised she didn't walk them once and even brought a random man back to stay overnight." — Betty
- "We have 6 Alexas in the house, we use them to make announcements like "dinner's ready", "come downstairs" or "what are you doing?" — Racquel

SMART CITIES MAY INCREASE THE RISKS OF SURVEILLANCE AS RIGHTS IN PUBLIC SPACES BECOME UNCLEAR

'Smart' means increased privatization, data tracking and sharing.

- "The risks of smart cities are that they may lead to more privatization, walled gardens and public spaces that are not really public [...] You see this trend in cities across Africa, sometimes it's just one compound after another." — Digitisation & Smart Cities Lead, UNDP

In 2018, Mayor Sadiq Khan published the roadmap to make London a world leading smart city. The gasholder regeneration project in King's Cross led to the privatization of public spaces, and increased experimentation with surveillance technologies. This is one of the many pseudo-public spaces in London where individual rights are unclear.

AMBIENT TECHNOLOGY CAN ENABLE INDEPENDENT TRAVELLING

There is a desire to "upgrade" neighbourhoods with more surveillance to increase safety

People who are visually impaired (+2M in the UK and 285M worldwide) or have disabilities (+13.9M of whom +1.2M use a wheelchair) have limited means to move around independently.

Beacons and 5G enable a seamless indoor audio navigation that can allow them to travel independently.

- "The challenge is to keep it 'simple' and 'coherent' because that is the core need of this segment of users — you cannot overload them and that is why having an open standard is even more important than the technology in itself." — Umesh Pandya, co-founder @ wayfindr

WE ARE RAPIDLY DEVELOPING A CULTURE OF HOME-MADE SURVEILLANCE

Ambient technology can help in caretaking and emergency situations

- "They [elderly parents] can contact you without moving from their chair and you can drop in to check they are ok. Most of us with elder parents know they are unreliable at keeping the control on them [for emergency button to social services] so just being able to call out and Alexa hear them is great."- Anita
- "It can be used to promote independence. You can set reminders to take medication and so on."- Rossa
- "My elderly hubby had a stroke and now has a non-working hand in addition to sight loss. He can use any of the dots to call anyone, a dot in the bathroom enables him to broadcast when's finished so I can help him get back downstairs, he can tell Alexa to turn the light red to warn others he's on the commode!" — Yvonne

THE CURRENT HEALTH EMERGENCY IS ACCELERATING AMBIENT TOOL ADOPTION

'Smart home communities on social media now offer instructions and tips on how to best use Alexa to help the elderly in isolation.

- "I can't travel from Germany to England to visit my elderly mother because of Covid-19. I want to buy her a large echo show so we can chat face to face."- Amanda
- "My mom has dementia and is unable to use tech. She has wifi and I want to talk to her without her having to do anything so looking to buy an echo show." — Gareth
- "I'm thinking of getting an echo show for my elderly mother who lives alone in the Scottish Highlands." -James
- "Hospitals are not letting relatives visit due to the risk of [Covid-19] infection so we are looking to source spare smart devices that could be donated to hospitals." — Oscar, co-founder at Opearlo (Alexa skill designers)

LEARNINGS

- Difficulty in discerning fake news has real life consequences, some of which are increasingly dangerous.
- Lack of coherence between new services can lead to feelings of helplessness on the user side.
- Knowledge of bias and prejudice embedded in existing technologies leads to questions how we can trust new ones.
- Overall, there is a feeling of 'great unknown'.
- No one wants to feel alienated by technology because this may represent the only future we have.
- Connectivity and privacy are often perceived to sit at opposites of the same spectrum.
- Distrust towards others, and authorities, have pushed some to take matters in their own hands.
- Protecting our most intimate spaces is prioritised over everything else, the implications on wider society are often an afterthought. As a result, we are rapidly developing a culture of home-made surveillance.
- Smart cities may increase the risks of surveillance as rights in public spaces become unclear.
- Ambient tools enable independent travel for people with disabilities, such as those who are visually impaired.
- Ambient tools can be a helping hand in care taking and emergency situations for the elderly.
- The current health emergency is accelerating adoption of ambient tools among the more vulnerable groups.

TAKEAWAY QUESTIONS

- We are already seeing increased use of deepfakes, major security breaches, and so on. How do we 'regulate' the current connected world?
- Could invisible technologies bridge system incoherencies?
- Could chaos of T&Cs and unclear privacy rights worsen in a reality of invisible technologies?
- Could we design an ambient system that helps us identify the right information, store secure data, understand our internet rights etc.?
- How can we change the narrative that connectivity and privacy are not opposite?
- How can we reduce the barrier between us and "them"? The need for safety and security does not have to lead to increased surveillance.
- How does increased privatization of public spaces affect our individual sense of right and freedom? How does it impact our sense of state and citizenship?
- Does this lead to a separation between those that must rely on technology to live a day to day life and those that could opt out?

THERE IS AN OPTIMISTIC VIEW OF TECHNOLOGICAL PROGRESS AND A FASCINATION WITH NOVELTY

Desire for new technology overshadows any security or health concerns. In the future, this is likely to accelerate the adoption of technologies with higher potential risks.

- "I'm a big fan of technology.. cleaning robots I'm all here for." — Kate
- "It's a fun thing, facial recognition, my daughters use it. I don't know what the negative could be." — Kate
- "All these new ways of getting into their brains and hacking their perception, that really interests me." — Leila
- "We have 6 echo dots and there one in each room, it's great because it just follows you around." — Betty
- "It was a cool new thing to try, just a couple of settings (facial recognition)."- Teko

PEOPLE WANT A LOWER COGNITIVE LOAD AND NON-TRADITIONAL SCREEN DEVICES EMERGE AS HEALTHIER ALTERNATIVES

Voice based devices reduce complexity and put users back in the control seat:

- No "screentime", which has negative connotations, especially in families with children.
- Seen as shared time between listeners whilst screens are seen as creating separation.
- No "rabbit holes". Audio feels like it has a beginning and an end.
- Voice is concise — "Alexa, what are Covid-19 symptoms?"
- Voice removes physical and digital barriers. It's highly accessible by elders, children and people with disabilities.

"Just today my daughter asked Alexa to tell us about Helen Sharman and Tim Peake. At age 7 she was able to do this and understand the response whereas she wouldn't be able to do a google search." — Racquel

SMART HOME DEVICES HAVE BEEN HUMANISED AS ASSISTANTS

Voice interfaces are creating more personal experiences, which lead to more 'natural' interactions and therefore less concern for security and privacy.

The more invisible and automated computing is, the less people think of it as 'machine' .

Top queries related to Alexa on Google:
"When was Alexa born?"
"Alexa, when is your birthday?"

- "In times of loneliness I speak more with Alexa [...] we have an echo in each room, it's great because it just follows you around." — Betty
- "For my lil boy, one of the first things he learnt to do was to ask alexa to play baby shark when he couldn't talk much."- Racquel

PEOPLE FEEL CONFLICTED ABOUT WHERE THEY STAND AND ARE MAKING THEIR OWN TERMS OF ENGAGEMENT

We observed a clear gap between privacy literature and end users. The people interviewed were often contradictory and referenced popular analogies to explain individual behaviour.

- "I don't want someone looking into my room, but then again [...] even with data breaches there is an argument, like if someone was building a bomb in the next room."- Teko
- "Me and my daughters put duct tape on on phones when we watch stuff when we are in the bath — just in case, you never know.I heard that Mark [Zuckerberg] does it." — Kate

Tahaan stated; "I care about privacy for everyone"but when we discussed about cameras recording clients and passersby at his restaurant and outside of his home, he didn't think the same principle can be applied.

TRACKING AND DATA SHARING ARE NOT TOP OF PEOPLE'S MINDS, UNTIL THEY BECOME VISIBLE AND TANGIBLE

For many, the first and main indication of tracking and data sharing is seeing targeted ads.

- "When my husband and I talk about something, we then see a related ad, it's creepy."- Betty
- "Wait, does giff gaff share my info with a third party?! I don't know?" — Teko

However, for most of the people we spoke to there was little knowledge about when, how, what and why platforms collect personal data until this becomes becomes very visible.

- "We discovered that the echo had been recording all of our conversations without consent, but we found logs of our conversations on the app so we are now a lot more conscious when we want to have private conversations we mute it."- Betty

- Karim is aware of the risks of government surveillance, but perceives this to be a 'visible' act that is more common in the physical world, rather than online: "I'm mindful, but I'm not paranoid [when talking to family on social media]. I don't think I need to be?"
- Possibly need to be more concerned, unfortunately i'm not. Probably won't unless I become a victim to it, and then i'll take it more seriously and I'm probably not the only person to have that viewpoint."- Racquel
- "It's not clear what the consent is for TFL to collect data, they don't really tell you."- Umesh

WHEN TRACKING IS A CONCERN, IT IS INCREASINGLY DIFFICULT TO OPT OUT

There is a sense of having very little choice when it comes to online access

- "The fatigue of information security, I'm losing the battle, I used to be better, but I now leek data everywhere. There are countries I will never travel to because of my digital footprint." — Leila
- "I simply refuse to sign up to Facebook because I don't want to be packaged up into a product they sell. I do read a lot on Twitter though because you don't need to create an account." — Richard

The implications are enormous in the health and emergency sector

- "If you are not registered, screened and have a refugee status ID then you cannot access any of the services. It's a terrible situation now with Covid-19. The challenge is that many don't want to register or end up providing a fake ID because they are escaping persecution." — Protection Coordinator @ Danish Refugee Council

PEOPLE DON'T WANT THEIR FUTURE RUN BY OTHERS, REGARDLESS OF AWARENESS LEVELS

People express fears related to intentionality and accountability…

- "I got that scifi movie horror panic that I fear we end up doing nothing and just being powered by electrics (on driverless cars)." — James
- "That kinda scares me, where the robot will look like us but won't have any of the empathy." — Kate

… which could be further perpetuated by the invisible nature of ambient technologies.

- "If there was a super advanced AI that was completely benevolent, I wouldn't care if it had all my information."
- "I would consider some sort of ownership of data for yourself, like a digital bill of rights so everything created by you is encoded and owned by you."- Leila
- "Surveillance could work well in a well established system where there was no risk of infringing individual personal lives, but no such system exists."- Karim

PRIVACY AND SECURITY AWARENESS IS FAR BEHIND ADOPTION

There was a 70% increase in smart device sales between 2018/2019*. Popular privacy related searches have barely increased year on year.

- The large spike in April was from a news article detailing Amazon employees ability to listen to Alexa devices in homes.
- Search volumes quickly returned to usual levels a few days after publishing.

LEARNINGS

- Desire for new technology overshadows any security or health concerns. In the future this is likely to accelerate adoption of technologies with higher potential risks.
- People want a lower cognitive load, and non-traditional screen devices emerge as healthier alternatives.
- Smart home devices have been humanized as assistants, possibly leading to more positive connotations around those helpers. This is particularly true with voice interfaces as they continue to create experiences that lead to more 'natural' interactions, causing less concern for security and privacy.
- Privacy and security awareness is far behind adoption. People feel conflicted about where they stand and are making their own terms of engagement. We observed a clear gap between privacy literature and end users.
- Tracking and data sharing are not top of people's mind until they become visible and tangible. When tracking is a concern, it is increasingly difficult to opt out.
- Regardless of awareness levels, people don't want their future run by others. People express fears related to intentionality and accountability, which could be further perpetuated by the invisible nature of ambient technologies.

TAKEAWAY QUESTIONS

- How do we design tangible rights in a world where there are increasing invisible forces at play?
- Is there increased danger of disinformation and misinformation with voice interfaces?
- Could ambient technology help us better understand 'my rights', 'our rights'?
- Multi-screens, short-form information and short-videos already impact how we make sense of the world around us. How does moving to a world of voice interafece affect the way we process information around us?
- Is there a growing separation between the 'formal' and the 'dark information world'? If so, how will this re-shuffle the information contained in each of the two worlds? Will the dark web no longer only serve for 'illegal activities', but for anonymous debates and conversations?
- What does increased invisibility mean for civic responsibility and sense of participation in society?
- How can we design half-anonymity in ambient reality — how do we design 'IDs' or 'logins' that ensure protection of identity as well as full accessibility and personalised services?

WE ARE WITNESSING NEW RISKS AND VULNERABILITIES

Fake news and theories of Covid-19's origin are leading to dangerous and harmful consequences

- "This side of the community is great. But there's a rabbit hole...like don't take ibuprofen, 5g caused this" — James
- Kate did not believe in the bats theory, but does believe in the 5G theory: "It's like when they were said Ebola was caused by people eating monkeys."
- "So you guys don't believe in the whole 5g theory then? Wuhan was a test centre for 5g last year."

Some lockdowns have led to social unrest and looting

- We are gonna fuck up the world so badly it's gonna be better living in the virtual reality."- Leila
- "I am distracted, something pops and it's a new development, next thing half your day is gone... trying to shop, trying to stay sane."- Teko

TRACKING AND SURVEILLANCE: IS THERE A RISE IN ACCEPTANCE TOWARDS THE IDEA?

New health apps are encouraging to self-report symptoms. Public opinion is splitting into staying at home vs. those 'flouting the rules'

- "There are people and cars flouting the rules, people using the play equipment. Is that ignorance, lack of education, I don't know, I do think we need some kind of enforcement." — Racquel

EXISTING ALTERNATIVES ARE ALSO ENTERING CURRENT TRACKING CONVERSATIONS

"Alliance partners share the belief that identity is a human right and that individuals must have "ownership" over their own identity"

- Whom would technologies such as this really benefit?
- What could be the new dangers and risks?
- Could new discourses on privacy and individual freedoms change how alternative tools are implemented?

LOCATION TRACKING IS BEING UTILISED TO FIGHT COVID-19 OUTBREAKS

How they are implemented across China, South Korea & Singapore?

- Different apps used – incoherent tracking and algorithms resulting in unreliable 'health status'
- Oversharing sensitive personal information led to public shaming and blaming
- SG has been applauded for using a template of data collection that strikes a balance between individual privacy and fight

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TRACKING AND SURVEILLANCE: WHAT ARE WE READY TO NEGOTIATE ABOUT TO GO BACK TO 'NORMALITY'?

How the app would track Covid-19 contacts

- The NHS is collaborating with Microsoft, Google, Palantir and Faculty AI to create screens that would show the spread of the virus based on data gathered via 111 calls and Covid-19 test results.
- In Europe, mobile carriers are sharing data with the health authorities in Italy, Germany and Austria, in order to help fight Covid-19 by monitoring whether people are complying with curbs on movement. This is done whilst respecting Europe's privacy laws.

THE SITUATION HAS HIGHLIGHTED INEQUALITIES IN HEALTHCARE ACCESS

In Turkey, it is estimated there are 3.66 Million officially registered Syrian refugees, but many more may not be in the legal system.

- "In Hatay, Turkey, If you are not registered, screened and have a refugee status then you cannot access any of the services. It's a terrible situation now with Covid-19. The challenge is that many don't want to register or end up providing a fake ID because they are escaping persecution." — Protection Coordinator @ Danish Refugee Council

IN ISRAEL, COVID-19 RISKS FURTHER EXACERBATING CURRENT RELIGIOUS DIVIDE

Ethnicity, religion and place of birth determine healthcare access

- "It's a permit-based country so your ethnicity, religion, background, where you are born and your name will determine your rights and access to healthcare services. The lower 'tier class' citizens can only really access hospitals in very underfunded areas with much lower standards." — Covid-19 emergency response coordination Lead, Palestine

Closing borders meant many Palestinians have lost their main source of income

- "Due to new mobility restriction measures to fight the spread of the virus, Israel is no longer allowing Palestinians to work in Israel, many of them actually work and live in Israel."- Covid-19 emergency response coordination Lead, Palestine

REFLECTIONS

This section does not aim to provide an exhaustive story on emerging issues related to Covid-19, but attempts to act as information about the research that inevitably spilled over into Covid-19 related conversations.

- Who are the winners and losers?
  - The narrative is that 'we are in this together', but we are physically distant in a world powered by virtual communication tools ('contactless' delivery services, social media and news outlets) as the only lenses into the rest of the world.

- Surveillance and tracking: we must look at it from every possible angle and beyond the top down narrative.
  - We are seeing individuals calling police on others flouting the rules, and sharing the locations and information of people who may be flouting the rules on semi-public Facebook and WhatsApp groups.
  - At the same time, citizens in SG and SK may be happy for mobile tracking to be used for public safety. The question should perhaps shift from 'tracking or not' to how do we guarantee individual freedom in a system where there is tracking?

- News outlets and governments seem to be increasingly pointing fingers at the public flouting the rules and not staying at home. Is this shifting responsibility from government to citizens? In the UK, government directions were confusing and changing day to day in w/c 15 March.

- Idea of 'going back to normality': what are we/will we be ready to give up or negotiate about in order to go back to a so called 'normality'?
  - What is perceived to be as 'normal' and what are the dangers of understanding this and mimicking it?
  - Could we be going to an illusionary 'normality'?

- Fake news and hate speech online have been fuelling divisive rhetoric.
  - We see decreasing space for nuanced conversations and increasing 'us against them' type of messages. We've experienced these during elections and Brexit, but how will these now impact national identity?
  - Nuance is what also helps us see and consider different angles of any argument and story. Will there be space for nuance in an ambient reality?

EXPERT INTERVIEW LIST:

- Dragana Kaurin - AI and Refugee Rights - Berkman Klein Centre
- Andrew Zolli - Planet Labs, San Francisco
- David Sangokoya - 4th Industrial Revolution and Civil Society - World Economic Forum
- Shannon Matter, Parsons New School
- Rachel Coldicutt - Careful Industries, UK
- Anasuya Sengupta - Decolonising the Internet, UK
- Tim Maughan, Author
- Madeleine Elish, Program Director, Data & Society

NOTES:

- All interviews were conducted via Zoom.
- All participants were offered an honorarium as appreciation for their time to participate, not all participants accepted the honorarium
- Though the interviews were also recorded, these are not shared with the client as these were recorded for the researchers benefit only - as was advised to the participants
- These notes capture the summaries of discussions.
- Statements bolded or in colour indicate key insights or nuances that the participant provided Approvals for Expert Quotes have been provided by David S, Madeleine E, Rachel C, Tim M, Andrew Z, Dragana K. Insights are in text that is pink/purple

Ms Dragana Kaurin (Fellow - Berkman Klein Center, Harvard University).
01 April 2020 - 6pm CET

Background: Dragana works with marginalized groups, indigenous groups, refugee groups

Which domains might be the most impacted by ambient intelligence? In what ways? Some examples here that are changing how refugees/ minoritized groups interact with technologies:

- UNHCR Jetson Project
  - Technology should be available to everyone — reinforces structural and colonial powers and abuse- this tech is not for you, you're not part of this
  - If the tech is predicting where I am going, how do you know it before I do? How and why should I trust you? And will this prevent me from getting to the next border?
- Who is it working for really? What does this mean for me?
  - Amazon Predicting Deforestation
- Not including groups that live there — patriarchal attitudes
- Groups find it so difficult to engage in these conversations because its violently excluding
- ICRC Trace the Face
  - A lot of information about personal information was available publicly, but people whose information was put forward was not informed that they were linked to this platform, nor were they informed that they were nominated as a contact point.

Who (or where) is most likely to prosper or flourish as a result of the change, and why?

- English speaking, white people, in power, rich
- Things are designed to work for them

Who (or where) is most likely to bear the brunt of the change, and why?

- Those with different gender, sexual identity — platforms aimed flattening identities
- People that minoritized, refugees, people that don't fall within the system, those that are homeless

How might some of these implications alter people's lives (in your demography) and access to economic, social, ecological, equity aspects?
Here is an example on (population tracking) systems:

- Example: 'Celebrite' (digital intelligence platform) — refugees are monitored by each country they travel through, even before they arrive at the next country
- You have no physical agency, no agency over your own body — therefore no agency over your digital body — how it's being monitored, surveilled
- My interviews with refugees have shown that they feel targeted by this, don't feel safe in their new countries even after they arrive. They don't know what is happening to their date and they feel their data will be used against them even when they have arrived at their final destination and are meant 'to be safe'
- The technology is not being explained to them. Whether this is biometric collections, or identification, to movement tracking: "I only found out what the impact of that technology was only after I arrived — they are not part of the conversation, and I was not told that this is what is happening. I give my fingerprints, my data but have no idea why or what it is used for. I don't even know what the machine is and sometimes that is very scary"

Are there historical, structural and cultural considerations we need to keep in mind as we are designing these possibilities?

- What are the community group values that are shared, not the individual values?
- Recognize that in some communities or groups, multiple people might share the same group software or hardware. A Facebook profile could belong or be accessed by multiple people in a family.

- Consider the decisions that your technology is aiming to illicit — who are those decisions for? For example, if I gave you permission to use a photo of a family member for (humanitarian) tracing purposes, how do I know that this information/photo won't be used in any emerging technology uses that you then develop?
- Digital rights organizations are pushing narratives of the future that aren't necessarily true of the context of other cultures (for example, freedom of expression from the US being projected to Myanmar). We need to consider local, cultural perspectives of human rights that can be adopted to digital rights.

What assumptions are we making of these futures?
- That refugees are dumb, poor, helpless and don't know how to help themselves and we (the designers) have to work out how to help them through the systems and designers themselves that are far away from theissues.
- Those that are coming up with these solutions think that they are doing the right thing and that's not just enough. Just wanting to do the right thing is not enough anymore

Who is already making strides towards these futures?
- Engine Room — as individuals, and acting consciously about whether they are part of the problem
- UNHCR Innovation
- Palantir (ironically) is the only one tracking missing women going through the Balkan corridor (but Palantir is so troubling so this might not be a good example. They don't prioritize consent)
- Google. Interestingly they are not intentionally doing good work, but unintentionally, people are increasingly using their platforms to get their own information. For example, WhatsApp — this wasn't created with the stated intent of helping refugees. However refugees end up using these technologies because they are so easy to

use and can then be redesigned to work in ways that actually work for them and their contexts (example of refugee groups using them whilst on boats to keep in touch with the support groups on shore that are guiding them to safety)

How might the global pandemic COVID-19 impact how these technologies might be used in our new normals?
- (I don't know yet, it's too early to tell)
- It could be used to prevent refugees (those outside the system) to ever
- leave their situation

Andrew Zolli (Head of Impact - Planet Labs)
01 April 2020 - 7pm CET

Note: The phrase 'ambient technologies' is unclear, and also what Omidyar fundamentally means when they use this phrase

Which domains might be the most impacted by ambient technologies? In what ways?
An example is in global transport systems (i.e. Uber) — in order to achieve success, they have to dismantle quasi-public good transport systems. They take large amounts of public capital and subsidize it below market rates and make it impossible for the state service to operate. Then once the state service is dismantled, and Uber can then charge what they want: they use private equity and private capital to monopolize systems.
Ambient tech (if it's understood correctly) often masks ideologies of power. It is profoundly wed to a market ideology of dominance, eclipsing of public good by private interest. This is true all across the spectrum of ambient technologies. The overall framework of technology driven global capitalism is to sink below the level cognition — it's to be everywhere, pervasive, and perceived uncritically as part of the ambient environment (transportation

tech, AI, IoT). They are manifestations of a political philosophy. If we just accept them, we are accepting certain market ideologies in lieu of any other

Who (or where) is most likely to prosper or flourish as a result of the change, and why?
Those that flourish is technology mediated monopolies. Why they innovate is to not improve on public goods — that is a fallacy. They are putting in place systems to eliminate labor completely and move to a self-driving monopoly. It's predatory capitalism that puts shareholder wellbeing at the center, and that doesn't put human well-being at the center.
Behind those market ideologies are a Grand Bargain between the politically powerful and financially powerful (i.e. why France can just say no to Uber). These technologies co-opt and corrupt the state to dominate.

Who (or where) is most likely to bear the brunt of the change, and why?
AI is most impacting those in repetitive labor (automation replacing repetitive labor) without any strategy to help people to migrate to higher labor markets. People that would be displaced are those that don't have power (people that are fundamentally vulnerable socially and economically).
As an aside, we should also note that it has made commodities less valuable. For example, Google has made information more findable but made it less valuable to produce (i.e. journalism is now eroding all over the world). We can find more available information, but certain types of information are being diminished.

How might some of these implications alter people's lives (in your demography) and access to economic, social, ecological, equity aspects?
The increasing sense of resentment, increased racism — they tear at the social fabric. Andresen Horowitz said "software will eat the world" — which sounds great unless you're on the menu.
One of the great myths about these technologies is that they are created by 'entrepreneurs'. In reality, the state has a huge role of play. It is not the

"heroic entrepreneur" working by themselves. Public goods brought to the point of discovery and commercialization.

The necessity, the inevitability and the ambience of these technologies is a marketing message. They do provide lots of value to humanity but there is a deeper centrality of self-preservation of powerful interests. They will never achieve their fullest potential as long as we are considered customers and not owners. And when that shift occurs, amazing things can happen. These ambient technologies, they are tools of human development and as humans develop their own capabilities to use them, we redesign them Technologies don't result in change by themselves — they are driven by choices. So, what kind of different choices we can make

Are there historical, structural and cultural considerations we need to keep in mind as we are designing these possibilities?
If equitable technologies could be made more open, you are not then obliged to the market system that creates those technologies. There is enormous promise if carefully crafted avenues are made possible — where open participatory humane ambient technology is much more calibrated to the needs of real people than markets are
AI has huge potential, but not for everyone — only those that can afford it. We can use them to reinforce bias, and to eliminate bias. Human beings are biased, but we are also flexible — but we can learn new information.
There is so much undeveloped human capital in the world. Sadly, the great AI of tomorrow is not going to deliver accessible tools in everybody's hands. We institutionally want to preserve control and power of these technologies, but we don't democratize it so that everyone can use it
How do we create the architectures of participation around these technologies (not just access, but what they get to do with them, redesign them) and balance them with commercial interests? (For example, Facebook's interests don't capture the interests of citizens, police, or the state. How do we balance these many interests?)

What assumptions are we making of these futures?
That people can't be trusted to design these futures, they have to be designed by 'those in the know' The average person has an assumption that technology driven futures are inevitable and so we have to an extent just given up control (i.e. we can't stop Apple, we can't live without Google, we can't stop Uber). What is really inevitable is that powerful market economies use technology to further their own interests

Who is already making strides towards these futures?
I love WeRobotics — diffusing technologies into the communities that are responsible for using them. Designing with and not for them. BRCK (coming out of Ushahidi) is another good example — making the internet accessible for everyone

How might the global pandemic COVID-19 impact how these technologies might be used in our new normals?
There are a set of tech that are useful for public health surveillance — could evolve into 'little brother' surveillance. Some autocrats are going to harness this for more significant forms of surveillance

David Sangkoya - Lead, 4th Industrial Revolution and Civil Society, World Economic Forum
2 April 2020 - 11am CET

Which domains might be the most impacted by ambient technologies? In what ways?
The social sector is an obvious choice. How these technologies get used under the premise of public interest/public good but at the same time, box customers/people into public goods that they might not actually want or need.

What is obvious is the intrusion of technologies into the social sector under the guise of 'efficiency' but it's actually causing great disruption and increasing risks to people already vulnerable or struggling. 5G is one of those amplifiers — the confinement and risk to vulnerable people will happen that much faster at a speed we won't recognize. Faster means harder to account meaning harder to seek justice.

Who (or where) is most likely to prosper or flourish as a result of the change, and why?
There are opportunities around AI in amplifying the efficient efficiency functioning of technical work. There are opportunities around data, and how we can use this to understand and achieve broader goals, as well as building evidence particularly around human rights/justice

Who (or where) is most likely to bear the brunt of the change, and why?
It is amplifying vulnerabilities that are already there — both social, economic and others. People that don't always have the same voice (black experience, sexual minorities) — anyone that makes below a certain amount of money.
We are not improving anything; we are continuing the status quo where there are the same groups of people that are excluded and disenfranchised
{EXAMPLE}: Grindr — LGBTIQ people traditionally knew where and how to meet each other. The tech provided the platform for people to meet each other. But it's now dystopian....it narrows down the identities of its members through an app. People become an avatar. The app could have provided some level of personal thriving (through the social/romantic connection) — but it exacerbated issues that were not thought of. Power gets translated to an app world and stereotypes get exacerbated (no blacks, only skinny people for example). It turns connection into pornography — what people see online is what translates to what they value in others. For those that don't fit into the category of white, straight/male looking — the stereotypes become what you feel you have to play into in order to meet someone or

have a connection. You embrace the avatar and stereotypes that others with power set. Your avatars blend both the digital and physical grindr (only narrowing down to virtual intimacy). When you use Grindr, you get pushed into a white, gay perspective of who you are rather than trans perspectives of who you are. Authoritarian regimes are also using the Grindr data to track people in countries where homosexuality is outlawed. It has made being LGBTIQ unsafe.

How might some of these implications alter people's lives (in your demography) and access to economic, social, ecological, equity aspects?
See above example — but who decides and who takes what action around these data points. And why are they taking those decisions, and whose inputs are they seeking?

Are there historical, structural and cultural considerations we need to keep in mind as we are designing these possibilities?
Firstly, it's recognizing that the LGBTIQ community is not a community, but a group of people forced together by others, and bound together by their shared fate)
- When designing for it, include intersectional users — not just white gay male, but what about black queer perspectives. Don't just look for the majoritied assumptions
- The technology is being used by a lot of different people that have different needs, desires and outcomes. Get a better sense of who you could be designing for, and the scenarios that could emerge and have space for that design to be iterated over time

This narrow view makes us only have one lens that we see the world and it narrows, and undoes the decades of activism for more intersectional amplifiers

What assumptions are we making of these futures?
In a 5G world all of these would happen a lot faster, and the group data

affects that we see now and that predict how groups might behave are problematic. I feel threatened because how it can be used might make my security unsafe (based on the type of regime I am under). And it influences how I think about my future and where I am safe (for example — smart cities make me feel unsafe as it can track identifiers about myself that I don't want people to know). I don't want to live in the US and don't want to return there as their failures in design will impact me and I will have no protection against that. So where can I move that gives me new types of digital rights, or where the digital regime isn't connected to the actual regime?

How might the global pandemic COVID-19 impact how these technologies might be used in our new normals?
The types of decisions that we only thought refugees make (my rights versus my safety) are now all impacting us — in fact in some spaces governments are making these decisions for us. Civil society is now forced to become a digital civil society in the communities they work with — it happened in panic for some. How do we ensure a future of digital civil society that can still be independent and do something? What does civic engagement look like — will networks become smaller as a result of social distancing? How can we work with these platforms to push out balanced agendas and what are the tradeoffs? Is there a way we can participate but not 'feed the beast'? The future of work agenda is now strong and how we are going to be educating future generations and new skills — particularly in Ed Tech.

Tim Maughan - Author (Infinite Detail)
3 April 2020 - 5pm CET

Which domains might be the most impacted by ambient technologies? In what ways?
The phrase transformation is an interesting one as we are looking at an invisible transformation. The phrase ambient seems to suggest it's happening in the background, not demanding your full attention. People's lives will be

changed in ways that they don't actually realize, while it's still happening to them. People are being tracked, monitored in ways that they are not even aware of.

What's fascinating at the moment is whether people's push back against ambient technologies might fall by the wayside in response to people's concern to manage public health, but also the platforms that are now supporting those that are in lockdown (Amazon, Uber, Zoom)

As this crisis is forcing us to become more reliant on these technologies, we will become less critical and to just accept it. And this clouds any kind of critical thinking about these issues. It's not even about things as blatant as cellphone or location tracking, but around platforms that we use to interact. When AI is making decisions or trend decisions based on what we are doing now, is it resulting in increasing anxiety?

There will be a big real estate land grab by companies like Amazon. These ambient technologies aren't setting out to make fundamental transformation change, but to maintain it.

Who (or where) is most likely to prosper or flourish as a result of the change, and why?

Who (or where) is most likely to bear the brunt of the change, and why?
The working class or marginalized groups — they are the parts of society that these technologies are tested on. They are designed to 'disrupt' other people's jobs

How might some of these implications alter people's lives (in your demography) and access to economic, social, ecological, equity aspects?
Capital does not set out to disrupt itself, but it sets out to exploit labor in ways that can make more capital. Its set out to reinforce the status go. You have to critique class and economics, and how it amplifies and magnifies on racism.

Are there historical, structural and cultural considerations we need to keep in mind as we are designing these possibilities?
You have to critique class and economics, as well as structural inequality. It is embedded in capitalism. Even if you got rid of capitalism, you won't get rid of racism, misogyny etc. The core belief that competition is good is an enabler for a lack of solidarity Complexity and global systems — we have handed over control to very complex systems that we don't really understand.

What assumptions are we making of these futures?
It's handing things over to external forces to control the structure of society. We think the future is going to be like a star trek future but it's like a shimmering curtain and we don't really know or understand what is behind that curtain, but we get entranced. And we follow blindly the instructions and stop critically thinking about those instructions. We have automated labor and we have automated management

We have delegated too much control from our personal lives to our economy, to increasingly complex networks

We have removed decision making about us that we don't even know are being made for us. The information being collected about us and is being used to impact on other people. How are those decisions being made about other communities? We should have some responsibility over that. Those decisions are being made by my experiences, behaviors and my choices but without my consent.

Who is already making strides towards these futures?
Young people give me hope and activism (BLM, climate marches, women's marches). The idea that we can create solidarity. Signs of kindness give me hope. There's always a potential even in the darkest times, we need to find a human centered approach to this rather than a capitalist centered approach. Pointing out dystopias is a hopeful act.

Shannon Mattern - New School for Social Research
9 April 2020, 3pm CET

Note: A lot of this discussion centered around COVID

Which domains might be the most impacted by ambient technologies? In what ways?

Pandemic changes people's expectations towards privacy, and people giving up their rights towards privacy — public health surveillance likely one area, education as well.

Cities have to be designed for public health concerns, not necessarily efficiency. This is the concern with smart cities — that we are chasing the wrong thing.

Who (or where) is most likely to prosper or flourish as a result of the change, and why?

People who are already enfranchised, people who have the luxury by shelter in place roles. People who are not already targeted by surveillance technologies.

Who (or where) is most likely to bear the brunt of the change, and why?

Marginalized people are already bearing the brunt of this change. As we move into a smart environment, it wouldn't change this.

How might some of these implications alter people's lives (in your demography) and access to economic, social, ecological, equity aspects?

Thermal sensing guns that are placed in public spaces, they are not an index of COVID, but ambient infrared tech looking for increased temperatures, or coughs. It's an indication of what might 'be'. But who might lose out as a result of this? Anyone who's contribution requires mobility.

Dehumanizes forces that provides 'contactless automated delivery' possible

Informal living situations — those that aren't counted by the census

Are there historical, structural and cultural considerations we need to keep in mind as we are designing these possibilities?

Recognition can be used in beneficial ways to gather data for producing a vaccine, but we do not have sufficient data for its impact on different cultural and ethnic groups. How do we find a way to ethically balance pro-social use of technologies?

What assumptions are we making of these futures?

We've made an assumption that technology futures are a bit of a fait accompli. However, we can have informed refusal, but we can also choose not to participate. Multiple levels of resistance are popping up. Community based modes of resistance to thwart forms of surveillance/tracking.

{FOR EXAMPLE: A whole city that decides to reject the installation of 5G infrastructure because of historical reasons. In a few spaces that had rejected 5G installations, stalling is now a technique. Skepticism around property values, where research is designed from telecommunications}

Who is already making strides towards these futures?

Proposed marketing benefit to every new technology could solve the digital divide — but this is difficult in rural areas. But this doesn't solve the problem of access. Public safety/public health applications as well as efforts that deploy transit more equitably.

Final notes: What is more than human AI? Non-human sorts of utility of these technologies/sensing...we are dealing with microorganisms, could these ambient intelligence be used in beneficial ways that don't live in human terms?

Madeleine Eilish - Data and Society
9 April 2020 - 6pm CET

Which domains might be the most impacted by ambient technologies? In what ways?
Hard to find a domain that isn't being impacted — when you release tech in one place, it has ripple effects elsewhere. When one technology is being released into the American agricultural ecosystem, it also changes how the farming communities are impacted. It's a ripple effect
Actually, we often talk about what is changing, but there is a lot that stays the same. For example, in the healthcare industry — when you look at what it is to be in the hospital now versus 20/50 years ago — yet there are nurses/doctors still doing the same types of jobs. When we focus so much on what is changing, we lose sight of what continues, what remains the same. When something is disruptive, we are breaking things and people are impacted by it. Social fabrics of how people work and how people are connecting the breakages that require repair is what is actually needed to keep connectivity going.

Who are the people that allow that continuity going?
{Hospital Example: A lot of the ways in which designers plan for the tech tools to be used, isn't how it was used. The nurses that were charged with conveying the risks were now doing a lot of work to repair the breakage that this tool introduced. It was the processes/power hierarchies/social structures around time and space that were getting disrupted. There are still pieces of the old that need to remain the same. Nurses were using a lot of emotional labor to ensure they weren't stepping on doctors feet. Designers had not thought about the power and social structures around when and how nurses interact with doctors, and how introductions of new technologies might disrupt that} There's a difference between tech that is deployed versus tech that is integrated. Deployed is a militaristic term.

Dropped into a place, contactless. Actually, when tech is implemented, it is integrated into the social context. It isn't just dropped in. People do the repair; people do the integration. We should look at the category of integration — where do we look for the people who are maintaining this continuity. It's part of the hubris of tech that thinks that that is all that is needed to change the world.

Who (or where) is most likely to bear the brunt of the change, and why?
The front-line workers — the last mile folks.
It's the people who are closest to the action, and also the literal operator of the technology. In general, the people who get missed are the people who enable the intelligent functioning of the technology.
{Example: people who label images. Invisible labor that goes into making the technologies actually work. The data sets have to be curated and put into a pipeline and then painstakingly corrected. AI can do a percentage of it but not all. There are people that are needed to make that intelligence function. Tech are interested to not have us see those people so that the selling points of these are about how they work seamlessly.}
{Example: self-checkout — transfers the labor of the checking out to the customer, but there is always an observer. Their work is integral but at the edge of the technology — the people that smooth over the rough edges of the technologies.}

It's people that are sitting somewhere around the world doing content moderation, labelling images, verifying models. People who are sitting in back offices scrubbing and cleaning data sets. It's not just at the point of integration, but it is across the board.
Invisible work to whom? Visible to other people who are working, their families — but we are talking about how certain kinds of labor are visible to the consuming public, or the management of a company. It creates an opportunity for us to take a certain perspective. It is rendered invisible through particular processes.

How might some of these implications alter people's lives (in your demography) and access to economic, social, ecological, equity aspects? Are these technologies making society more equitable?
This work just isn't about whether technology is really bad. How we look at this is how we make things better. When things are rendered invisible, the people that keep that continuity going, they are left out of the picture. Therefore, they are undervalued, underpaid, disenfranchised. And these create conditions for profound inequity. If we only value a certain class of people that create the idea of a technology, rather than those that enable that technology — we are undervaluing. This is why the intellectual work of demystifying how tech actually works, what is actually required to build and integrate technology is valuable.

What assumptions are we making of these futures?
My fellow researchers are worried as a group about who will be made more vulnerable and how technology might enable or extend that vulnerability. Tech does entrench existing disparities. What do we value in the world and that is who gets rendered vulnerable right now? Political instability and a lack of policy frameworks/proposals that can reign in some of these issues (particularly in the US). Also, we don't often think about tech is impacting on us until it actually impacts us.

Who is already making strides towards these futures?
There are structural and individual, genuinely good technologies. But where we begin the dynamics of inequity playing out is when those tech become not just an opportunity to make people's lives better, but at the expense of others. How do we value particular contributions to society? If we want to talk about how we intervene — and it is less about what the tech does, but how the company that develops that tech works or doesn't work, and how their business model values some people over others, or renders some people vulnerable at the expense of profits.

How might the global pandemic COVID-19 impact how these technologies might be used in our new normals? I really hope this is an opportunity to show how we value the work of our front-line workers, and how this translates into financial resources and social respect.

Anasuya Sengupta - Decolonising the Internet, UK
20th April 2020, 11am

Note: This was a long discussion on broad topics of ambient tech ethics and agency

Narrative Framing — whose narrative, why?
What if you threw a bunch of black/brown/trans/women/folks/A science fiction/ Afrofuturists — what would they be designing?
It is the narrative framing that needs to be ripped apart
The phrase of technology futures already speaks of a bias in its narrative. Even the phrase ambient reality no one understands. Even the phrase seamless integration is provocative — whose consent? The entire narrative has already set the scene of who has power- agency is not at the core of it.
Inclusion is problematic — a certain us is at the center of the world, and others have to be included.

How do we solve it? Diversity, but no one knows what diversity means. But it doesn't mean that it is being designed or created by people who are actually the majority of people that are the end receivers. The narrative imposes that we get heard, but we are not at the core of the design, the visioning {we meaning minoritied peoples)
We are starting the inquiry of what these futures look like deeply embedded in the framing of people in power and privilege — of the range of lives and range of experiences of people that are deeply impacted .
What happens when: majority of people, (black/brown/
- We stop treating minoritied groups merely as the end users?

- Marginalized publics are the majority of the world which are experiencing this tech without their consent. What happens when this marginalized public is at the center of the design?
- Don't use the word inclusive, use equity, and plurality
- Inclusion and diversity don't have any power or implications — it is whitewashed.

Design and Architecture

We say marginalized or minoritized — not minority. Saying minority is an act of colonization. The deepest colonization is of the mind. That is of the final frontier when we are talking about decolonization. What are the ways in which we have assimilated white supremacy and are unable to break free of that? The tragedy of Silicon Valley isn't the 'white silicon valley happy-go-lucky techy'. The hardest space to critique are the brown bodies in Silicon Valley who are at the core of the tech labour and many of whom are deeply assimilated into a tech hubris, into a supremacist hubris, and into a narrative framing that is very problematic. It's deeply troubling that so many of them seem like willing soldiers to the cause.

The levels of collusion between tech and authoritarian governments is something to look at very carefully when we talk about tech futures. Right now, the surveillance architectures are almost gleeful being used and expanded right now, using COVID as context and camouflage.

Who is at the core of design and architecture? What do we mean by difference and equity (as opposed to diversity and inclusion), where we acknowledge and celebrate difference?

Who we are is inextricably linked to how we walk the world, our bodies of knowledge?

The deeper level of freedom of the mind? What are our values? What are the frames that we look at ourselves in the world? The tech world is deeply embedded in the individualistic frame, based on the US/Western frame. We end up with a libertarian ethos that permeates the internet. We celebrate this.

Our lives are relational, inter-relational and connected.

Our individualism does not trump our pluralism and our societalism.

If those that are designing and architecting are not shifting this core narrative frame, then we are not designing for all and we are not designing 'for good'.

Impacts

The level of impact of this form of 'English speaking, white, coming out of primarily the US' and the way it infuses impact around the world is fascinating. This extraordinary sense of what is global is at the mercy of what is hyperlocal politics and power and based in Silicon Valley.

What gives Silicon Valley the right to be global? What does a set of futures look like that are translocal, that are connected through digital infrastructures, and through political and social threads? What is the plurality and possibility available to us, that through this connected tissue, we can embody deeply held community-based values that frame how we all see the world? The way that tech is constructed is deeply flawed. It's not just a platform — it's an architecture. We design it but we also inhabit it. It's relational. It's not where we begin and where we end. We should begin with what are the worlds we want.

The narratives of tech of deeply patriarchal, deeply colonial — are so rarely thought about.

The redesign of technologies could be extraordinary where it could bring oral technologies and embodied knowledge online. But how do it in ways that bring the holders of this expertise to the forefront. How do we reframe how we think about expertise? How do we bring the community archivist that sit in Ghana to the archivist in MIT and have them be on the same level of expertise? People sitting in Silicon Valley don't understand how many different internets there are. Asia is creating its own stuff. But how many people sitting in the valley think of the world as an English browser-based world?

Language is at the heart of epistemics. The way you think changes depending on the language you speak. Language becomes a wonderful entry point for people that don't understand the politics of epistemics. Our digital future is crassly monolingual, or at best bi-ligual (English and Chinese).

Assumptions about our future:
- Camp that has given up
- Camp that plays the in-between — challenge structure of powers from the outside
- Camp that is going out and doing their stuff, radical global south activists, techies, community organizers

Rachel Coldicutt, Careful Industries UK
20 April 2020, 330pm CET:

Note: This was a broad conversation about ambient technology futures and civil society The futures that these types of tech are helping us achieve is at the privilege of a tiny minority. Civil society quite often tidies up after technology. Can we bring the sensing role much further upstream? Rather than equity being something addressed after the fact, can we start to build more sense of equity and consequences at the beginning?
- We need to help civil society orgs to see what problems exist or are worsened by technology. Civil Society orgs need to be capability built to understand how those they represent in the social justice systems will be impacted, or missed or be unfairly targeted
- Technology in civil society is very focused on privacy and rights. What this means is one of the things that then gets left behind is people in more everyday minorities — those that are digitally excluded, but more to the point, people who have major economic limitations around their lives. Lots of people at this stage have a high number of conflicting and confusing problems (economic, socially) — {Example: young woman single parent, who has recently lost her job. You are in a position that in order to get your benefits you have to apply online. You need the ability to do that, and to have the data on your phone or laptop to do that. That is a cost. You are consistently paying a higher price for things just to survive. You are not part of the digital economy. If you use the data.

on your phone to sort out your benefits, you are not going to have the opportunity to use WhatsApp. As more infrastructure of normal life goes online — WhatsApp, book
groups etc., — the moment you start to lose your ability to intersect with that, you are losing a lot more. You are losing your safety net}
- There is a big focus on people that are having extreme incursion on theirrights (i.e. refugees). But not so much on those that are just at the edges, that the systems are not really working for and they have to hack their lives. Most people in business, govt that are in positions to make decisions, have seamless digital lives and their ideas of how the world works and its glitchiest isn't at the forefront of their minds.

It's very hard to know and how to know, who isn't included — in these times that everything is so online. Once you are accustomed to living with ambient tech and having other people's faces and voices pop up all the time — you treat it differently. There's a sense now, for people that are not online — that their lives are on hold.
When corporations make ethical statements, you're (as a corporate) not setting a high standard — you are saying this is the lowest you are prepared to go. Very often, corporate ethics codes are a way of acting ahead of the law, and to anticipate things that are not yet regulated for.

We think of ambient technology as seamless magical experiences that you can't interrogate; you can't understand — but they just work. They also encourage us to do future discounting — we trade off something now for something ambiguous in the future. Can our tolerance for data tradeoffs be elasticated around the individual rather than situations, so you know what you are trading off at your pace?
Smart Cities raises a conflicted question — what is the data that they would like to extract rather than what is the data I would like to give?
There are such few alternative voices telling what the possibilities of the futures might

be. Social reimagining is essential in this. What you get in real incrementalism is that risk is passed on to vulnerable people. But are there going to be moments in the next ten years to completely change the focus? COVID-19 is one of these moments. So how can we recognize that not everything is inevitable?

Things that I'm interested in:

- What happens when people get the right to repair their technology? Even the ability to do that, how might that change people's relationships with technology and their sense of agency?
- What does decentralize community technology look like? What happens when you understand just how much connectivity you have, and you can give some to your neighbor or a youth group? What does it look like when things are more tangible? The problem with things being ambient means you don't understand how it works. What are the little ways in that people need to get grappling hooks to make things more 'real'?

QUOTES (verified with interviewees):

- "The tragedy of Silicon Valley isn't the 'white Silicon Valley happy-go-lucky techy'. The hardest space to critique is the brown bodies in Silicon Valley who are at the core of the tech labor and many of whom are deeply assimilated into a tech hubris, into a supremacist hubris, and into a narrative framing that is very problematic and are willing soldiers to the cause." — Anasuya Sengupta, Decolonising the Internet

- EXPERT QUOTE: "The level between tech and authoritarian govt is something to look at very carefully when we talk about tech futures. If we look at COVID, the surveillance architecture is almost gleeful being used right now" Anasuya Sengupta, Decolonising the Internet

- EXPERT QUOTE: "Our lives are relational, inter-relational and connected. Our individualism does not trump our pluralism and our socialism" Anasuya Sengupta, Decolonising the Internet

- EXPERT QUOTE: "What does a set of futures look like that are trans local, some of which are connected through infrastructure, and through political and social threads. What is the plurality available to us, that through connected tissue, actually embed deeply affected values that can frame how we all see the world?" Anasuya Sengupta, Decolonising the Internet

- EXPERT QUOTE: "The irony of choice is how it flattens us to what we think is in front of us, to fit in. We become an avatar" David Sangakkara, World Economic Forum

- EXPERT QUOTE: "How we are going to be educating future generations and new skills required will be a driving force in post-COVID analysis" David Sangokoya, World Economic Forum

- EXPERT QUOTE: "Digital rights organizations are pushing narratives of the future that isn't necessarily true of the of the context of other cultures (Western definition of privacy--as the right to be left alone, and the to control information about oneself-- projected to organizations in Myanmar via privacy tools) — what are the local, cultural perspectives

of human rights that can be adopted to digital rights"- Dragana Kaurin, Berkman Klein Centre

- EXPERT QUOTE: "Often stakeholders in this space make decide on solutions for and about refugees without consulting with them or involving them in the design process, as if they are somehow helpless or incapable of designing solutions for themselves" — Dragana Kaurin, Berkman Klein Centre

- EXPERT QUOTE: "...The phrase transformation is an interesting one as we are looking at an invisible transformation. The phrase ambient seems to suggest it's happening in the background, not demanding your full attention. People's lives will be changed in ways that they don't actually realize, while it's still happening to them" Tim Maughan, Author

- EXPERT QUOTE: "Capital does not set out to disrupt itself, but it sets out to exploit labor in ways that it can use to make more capital. It sets out to reinforce the status quo. If you want to critique how technology impacts anything, you also have to critique class, racism and economics" Tim Maughan, Author

- EXPERT QUOTE: "We like to think the future is going to be like Star Trek — with tech-based solutions and convenience — but in reality, technology is a shimmering curtain and we don't really understand what's behind it, and it captivates us. We blindly follow the instructions and we have stopped critically thinking about what those implications might mean. We have automated choice. And in doing so, we have delegated control about our lives and our economy, to increasingly complex networks. We have delegated decision making about us without our consent" Tim Maughan, Author

- EXPERT QUOTE: " we assume that (people) can't be trusted to design these futures. They have to be designed by 'those in the know' " — Andrew Zolli, Planet

- EXPERT QUOTE: "Ambient technologies masks ideologies of power, and are profoundly wed to a market ideology of dominance, eclipsing public good by private interest" Andrew Zolli, Planet Labs

- **EXPERT QUOTE:** "The necessity, the inevitability and the ambience of these technologies is a marketing message. They do provide lots of value to humanity but there is a deeper centrality of self-preservation of powerful interests. They will never achieve their fullest potential as long as we are considered customers and not owners. And when that shift occurs, amazing things can happen. These ambient technologies, they are tools of human development and humans develop their own capabilities to use them, we redesign them" Andrew Zolli, Planet Labs
- **EXPERT QUOTE:** "How do we create the architectures of participation around these technologies …and balance them with the commercial interests" Andrew Zolli, Planet Labs
- **EXPERT QUOTE:** "The people that most get left behind are those that have everyday mineralization. Those that are digitally excluded, but more to the point, people who have major economic limitations around their lives" Rachel Coldicutt, Careful Industries UK
- **EXPERT QUOTE:** "When things are rendered invisible, the people that keep that continuity going are left out of the picture. Therefore, they are undervalued, underpaid, and disempowered. These create conditions for profound inequity. We value a certain class of people that create the idea of a technology, rather than those that enable that technology to work" Madeleine Eilish, Data and Society

"We could build systems for durability, but instead some dipshits told you we needed to move fast and break things" Audrey Watters, HACK EDUCATION

The 'smart everything' paradigm appears to be the rallying call of the 21st century — the digital Renaissance of our times. Where we are all distributed and connected more than ever. Where our desires, our ideas, our hopes and indeed our dystopias, are imagined in advance, predicted and laid bare to us, before we can even consciously articulate them. But these realms of imaginings and design, are being constructed in small pockets of power and privilege, inevitably making homogenous assumptions of all people will be most affected by these technologies.
More than 50% of the world's population is now online, approximately one million people go online for their first time each day, and two-thirds of the global population own a mobile device.

The automation of manufacturing, services and mobility has already begun. McKinsey estimates that 70% of companies may adopt at least one AI technology by 2030. It is unlikely they will all use it well, but those that do could manage to take us to a place where man and machine are indistinguishable. While digital technology is bringing tremendous economic and societal benefits to much of the global population, issues such as unequal access to the internet, misinformation, the lack of a global technology governance framework and cyber insecurity all pose significant risk.

This futures analysis sought to understand the ways in which ambient technologies affect and will continue to affect communities around the world, and in particular communities that are not necessarily in the mainstream of discourse, including marginal, disenfranchised populations, particularly those without access to human rights law or institutional remedies.
It should also be noted when we started this exploration, we were considering ambient technologies in a broader context with drivers however since we

have commenced this analysis, COVID-19 has disrupted at a global scale, all normalities. As it ravages our lives, it is reinforcing technological trends that started before this pandemic, leading to a surge in thinking around the fast-tracked emergence of digital humanism.
How do we include people in the instruments that shape the world?

COLONISED FUTURE

"..the relationship between tech industries and those populations who are outside their ambit of power — women, populations in the Global South, including black, Indigenous and Latinx communities in North America, immigrants in Europe — is a colonial one" Sareetyta Amrute, Data and Society

Companies today have a conflicted relationship to state surveillance: they pledge to protect data even while they capitalize on emerging markets where data can be bought and sold. State actors spin off products to sell to other state actors to track their citizens. All of these entanglements need to be followed and understood as complex imperial formations. As communications studies scholar Paula Chakravartty suggests in her studies of new media and racial capitalism, these are all interlocking formations, built on imperial rivalries and a tech worldview that imagines some figures — especially the migrant working classes of the Global South — as outside the world of tech itself.

Data, new applications, and social media are hierarchical. The companies that produce these technologies also produce an ideology of superiority that data journalist Meredith Broussard calls techno-chauvinism. Techno-chauvinism describes the belief of a small group of fairly homogenous people located primarily in Silicon Valley that they are the best people to deploy a small set of algorithmic applications to administer human life. A corollary of this belief is the ideology of meritocracy, a dogged conviction

that despite all evidence about uneven social and economic conditions and histories, it is individual effort and cleverness that promotes some groups over others. We see this play out in digital India — where only 29% of India's internet users are women. The digital divide is thus not simply a question of access to digital technologies but about the capacity to make meaningful use of the access to technology. In many parts of rural and semi-rural India, this capacity is directly shaped by gender biased belief and value systems that impose restrictions on the education and free mobility of women. Unless this digital gender divide is bridged, India's aggressive push towards digitization will only further entrench the political, economic and social marginalization of women.

Tech colonization doesn't just happen in the Global South. Police departments in the US are using algorithms to target prospective criminals. But this software is far from perfect, and the algorithms have led to cities being unevenly policed and certain people being unfairly singled out. Research by the Algorithmic Justice League uncovered large gender and racial bias in AI systems sold by tech giants like IBM, Microsoft, and Amazon. Given the task of guessing the gender of a face, all companies performed substantially better on male faces than female faces. The companies evaluated had error rates of no more than 1% for lighter-skinned men. For darker-skinned women, the errors soared to 35%. AI systems from leading companies have failed to correctly classify the faces of Oprah Winfrey, Michelle Obama, and Serena Williams. When technology denigrates iconic women, it is time to re-examine how these systems are built and who they truly serve.

Issues of bias in AI tend to most adversely affect the people who are rarely in positions to develop technology.

> "The underrepresentation of women and people of color in technology, and the under-sampling of these groups in the data that shapes AI, has led to the creation of technology that is optimized for a small portion of the world." JOY BUOLAMWINI, Algorithmic Justice League

Similar to the technical architecture of classic colonialism, digital colonialism is rooted in the design of the tech ecosystem for the purposes of profit and plunder. If the railways and maritime trade routes were the "open veins" of the Global South back then, today, digital infrastructure takes on the same role: extraction of data gleaned from the streams of information given up as residents of all countries go online, register for state benefits, and connect with one another through applications whose terms of service demand they give up their personal and private information. Big Tech corporations use proprietary software, corporate clouds, and centralized Internet services to spy on users, process their data, and spit back manufactured services. For example, Google siphons user data from a variety of sources — Google Search, Maps, Ads, Android location services, Gmail — to provide them with one of the richest collections of information on the planet. Through the Open Handset Alliance and proprietary control of their "killer apps", they ensure the world's data flows into their corporate cloud. They then process the data for consumer and business services.

Tech colonialism assumes that visions of Western ideals are the same ideals all people aspire to.

> EXPERT QUOTE: "Digital rights organizations are pushing narratives of the future that isn't necessarily true of the of the context of other cultures (Western definition of privacy--as the right to be left alone, and the to control information about oneself — projected to organizations in Myanmar via privacy tools) — what are the local, cultural perspectives of human rights that can be adopted to digital rights"- Dragana Kaurin, Berkman Klein Centre

HEALTH AS CURRENCY FOR THE 21ST CENTURY

COVID-19 has exposed the weaknesses of traditional centralized healthcare management systems which are not setup to withstand a global crisis. The

digital health initiatives that only months ago were on the sidelines of most health care systems. Countries put telemedicine on the fast track to monitor patients without having them risk going out. Robots have become the de facto assistant in healthcare institutions being impervious to infections; allowing remote consultations and even to keep the elderly connected to loved ones. Germany launched an online chatbot to screen for those potentially infected with COVID-19. More advanced technologies including AI are being employed to provide insights into complex questions of how individual behaviors impact transmission and identifying which policies are effective for specific groups. The pandemic is transforming the global health communities acceptance and use of digital health technologies.

The riskier part of this is on the emergence of disease surveillance systems that has become vital for early identification of public health threats. New methods were already underway for regional and global infectious disease surveillance, with advances in epidemic modeling aimed to predict and prevent future infectious diseases threats. Models using cell phone data , Twitter or open source mapping (like Health Maps or Open Street Maps) to track and predict disease outbreak and spreads. Whilst incredibly useful, there already existed an uncomfortable relationship with the ethics of disease surveillance through these approaches.
Combating COVID-19 hinges on the ability of governments to measure its spread and use that information to target their public health efforts. Countries that are performing well in managing the pandemic have had more effective contact tracing. Asian countries have gone the farthest in their contact tracing efforts, building upon systems and tools developed in the aftermath of dealing with SARS and (in the case of South Korea) MERS that rely on a combination of on-the-ground detective work and the use of invasive digital tools to track people's movements.

Contract tracing apps and location trackers are being deployed in Hong Kong, and China began a bold mass experiment in using data to regulate

citizen's lives — by requiring them to use software on their smartphones that dictates whether they should be quarantined or allowed into subways, malls and other public spaces. But a New York Times analysis of the software's code found that the system does more than decide in real time whether someone poses a contagion risk. It also appears to share information with the police, setting a template for new forms of automated social control that could persist long after the epidemic subsides. Google and Facebook are considering efforts to analyze the collective movements of millions of users to determine how the deadly novel coronavirus is spreading across the US, and to gauge the effectiveness of calls for social distancing.

Increased reliance on digital tools to monitor the spread of disease raises serious questions about how to prevent governments from using those same tools to track individuals for other purposes after a health crisis has subsided. Location data is so revealing that it effectively offers governments the ability to place citizens under intrusive but invisible surveillance. It provokes us to consider whether it might become a requirement for us to document not just our location at all times, but whom we socialize, work and come in contact with. Taken further it provokes whether biometric measurements such as continuous temperature monitoring could be used extensively (as is currently being used by Emirates Airlines coupled with legal requirements for data sharing and reporting to health authorities.

Currently, governments are rushing to put digital surveillance systems in place without due process or informed debate within their societies. Where in March 2020, the idea of a proof of immunity (an identity card to verify that you've already recovered or has the antibodies required to be immune) was being speculated, very soon policy makers in Germany, Italy, the UK and some US health experts, have floated the notion of rolling out immunity passports. And already, there's an app for that. A UK-based tech company (Bizagi) released 'CoronaPass' in April 2020 — an app that will use an encrypted database that will store information about users' immune

status, based on antibody test results provided by the user's hospital or other healthcare provider.

The problem with immunity passports is that there is no evidence of its accuracy, efficacy or safety. It also raises the issues of social inequality: diagnostic tests are already more readily available for the wealthy. Will immunity passports then shut certain people out of society whilst others are allowed back in? Will it favor § workers and not others?

Is the coronavirus the kind of emergency that requires setting aside otherwise sacrosanct commitments to privacy and civil liberties? Or like the 9/11 attacks before it, does it mark a moment in which panicked citizens will accept new erosions on their freedoms, only to regret it when the immediate danger recedes?

SURVEILLANCE STATE

"Mathematical models should be our tools, not our masters" — Cathy O'Neil, Weapons of Math Destruction

Whether we are aware of it or not, we are under constant, state-sanctioned surveillance, which is officially "justified" on the grounds of national security, crime prevention, road safety or public service improvement. Unofficially, retailers, goods and service providers and advertisers monitor our preferences, behaviors and habits, for commercial gain—drawing on data provided by us, sometimes voluntarily, but often unwittingly. Masses of "anonymous" data about population movements, financial transactions and leisure activities are mined, from surveillance cameras, travel cards, smartphones and tablets, wearable devices, internet searches, online orders, credit card use and social media. These data are analyzed, compared, integrated and traded without our explicit consent. Surveillance has a long history, but modern technology has revolutionized the accessibility, scope and speed of data collection and analysis.

Examples include economic surveillance systems such as those used by Google, Amazon or Facebook to target ads and product recommendations for consumers to more sovereign surveillance systems such as Palantir, China's social credit system, facial recognition cameras, Clearview, or other more sophisticated systems. The effectiveness of these and other private or public surveillance and control systems depends upon the pieces of ourselves that we give up — or that are secretly stolen from us. It is being used to judge whether we are good citizens, and imposing penalties based on random criteria of that judgement. We give up our rights to our global privacy when these systems become cross-border. Our privacy has become public goods, sold as behavior predictions that are about us, but not for us. In 2016, the Google-incubated augmented reality game, Pokémon Go, tested economies of action on the streets. Game players did not know that they were pawns in the real game of behavior modification for profit, as the rewards and punishments of hunting imaginary creatures were used to herd people to the McDonald's, Starbucks and local pizza joints that were paying the company for "footfall," in exactly the same way that online advertisers pay for "click through" to their websites3.

EXPERT QUOTE: "...The phrase transformation is an interesting one as we are looking at an invisible transformation. The phrase ambient seems to suggest it's happening in the background, not demanding your full attention. People's lives will be changed in ways that they don't actually realize, while it's still happening to them" Tim Maughan, Author

"Our digital century was to have been democracy's Golden Age. Instead, we enter its third decade marked by a stark new form of social inequality best understood as "epistemic inequality." Shoshana Zuboff, New York Times

There is concern now that emergency measures in place for COVID-19 will

become permanent, so enmeshed in daily life that we forget their original purpose. The world is currently enthralled by solutionist tech – from a Polish app that requires coronavirus patients to regularly take selfies to prove they are indoors, to China's colour-coded smartphone health-rating programme, which tracks who is allowed to leave the house. Governments have turned to companies such as Amazon and Palantir for infrastructure and data modelling, while Google and Apple have joined forces to enable "privacy-preserving" data-tracing solutions

Lockdowns have made many of us, sitting at home glued to our computers and phones, more dependent than ever on big tech companies. People might struggle remembering privacy rights when they are trying to deal with their own health concerns. Thinkers are warning that the pandemic heralds a darker future of techno-totalitarian state-surveillance. Some of the measures proposed impose severe restrictions on people's freedoms, including to their privacy and other human rights. Unprecedented levels of surveillance, data exploitation, and misinformation are being tested across the world. The worst is still to come: the pandemic will supercharge the solutionist state, as 9/11 did for the surveillance state, creating an excuse to fill the political vacuum with anti-democratic practices, this time in the name of innovation rather than just security.

> EXPERT QUOTE: "The level between tech and authoritarian govt is something to look at very carefully when we talk about tech futures. If we look at COVID, the surveillance architecture is almost gleeful being used right now" Anasuya Sengupta, Decolonising the Internet

TYRANNY OF INVISIBILITY

"The poor, the uninsured, the disenfranchised, the information-poor and the less mobile are sitting ducks" — Nesrine Malik, Guardian March

Tech inequality is only getting bigger — only those that can get online can thrive. Technology design often makes large assumptions about the needs, requirements, and agency of those that will use it, and those that are marginalized, minoritized and excluded do not get any opportunity to inform or consent in its architecture. They are invisible and exploited. The tyranny of invisibility is the output of design assumptions that people on the receiving end of tech products and services are helpless and are best used as test subjects. From drones patrolling the Mediterranean to A.I.-powered "lie detectors," from cellphone tracking to artificially intelligent thermal cameras can all be used against refugees.

Research has shown that technological experiments on refugees (for example) are often discriminatory, breach privacy and endanger lives. Algorithms used to power this technology are vulnerable to the same decision-making of concern to humans: discrimination, bias and error. Refugees are often left out of conversations around technological development, and like other marginalized communities, they often become guinea pigs on which to test new surveillance tools before bringing them to the wider population, and as a result they experience new technologies as violently excluding rather than invitingly inclusive.

> EXPERT QUOTE: "Often stakeholders in this space make decide on solutions for and about refugees without consulting with them or involving them in the design process, as if they are somehow helpless or incapable of designing solutions for themselves" — Dragana Kaurin, Berkman Klein Centre

> EXPERT QUOTE: " we assume that (people) can't be trusted to design these futures. They have to be designed by 'those in the know' " — Andrew Zolli, Planet

of people having extreme incursion on their rights. However, tech design invisibility exacerbates exploration for those that are just on the edges, who the systems are not really working for. The people that most get left behind are those that have everyday minoritization. As more infrastructures of normal life go online, those that lose the ability to interact with that, lose their safety net. A seamless digital life does not exist for everyone, and more in fact, it's a glitchy digital life that we deal with.

> EXPERT QUOTE: "The people that most get left behind are those that have everyday minoritization. Those that are digitally excluded, but more to the point, people who have major economic limitations around their lives" Rachel Coldicutt, Careful Industries UK

Exploitation of the invisible strangles labor from being collectivized or adequately remunerated — whether in gig economy work, and in the multiple forms of labor that are hidden and ghosted in making technologies appear to function without human assistance. Technologies that monitor worker safety also track every movement in the name of increasing productivity, which means demanding that workers work harder, take fewer breaks, and eliminate wasted movements. The hubris of technology also perpetuates the seamlessness of its architecture, but in fact automation requires people to fix, repair, and work alongside machines. There is a social fabric that weaves together how people work and connect with technology that repairs the breakages and glitches for everyday people. Indeed, those that smooth over the rough edges are at the front line, and are not protected or safe, and indeed are the most invisible and exploited.

With COVID-19, it might also be tempting to believe the best way to protect these front-line workers would be to have drone delivery, grocery stores without checkers, and increased automated decision-making across fields as diverse as content moderation and medical diagnosis. But automation will not keep front-line workers safe. It helps make it easier for those in privilege to dehumanize those that they do not see — to dehumanize their

Uber Eats driver, The reality is that making labor invisible makes society value particular contributions to society over others.

> EXPERT QUOTE: "When the processes of actually integrating a technology into a social context are rendered invisible, the people that create continuity within the existing context and limitations are left out of the picture. Therefore, they are undervalued, underpaid, and disempowered. These create conditions for profound inequity. We, as a society, value a certain class of people that create the idea of a technology, rather than those that enable that technology to work in the world." Madeleine Eilish, Data and Society

TYRANNY OF IDENTITY

"Yes, Digital IDs are efficient, but they are a threat to our very identities" Zara Rahman, The Engine Room

According to digital data — collected once and entered into a system — who we are is static: a series of unchanging facts. We are categorized by where we live, our gender identity, our year of birth, our ethnicity or race. Adjusting those records is difficult and often incompatible with rigid systems. Essentially, being our true and fluid selves becomes impossible in the eyes of the state. Digital systems – how they're built, the data they gather (and the data they don't), the categories we are put into, by design require a flattening of our identities-reflecting a prioritization of what most matters to the people collecting the data. Our identities are fluid – that's what makes us human – but digital systems require concrete boundaries to be established and people to be put in concrete categories.

Identity and belonging have always been complex issues. Legal identity is a vital enabler to full participation in society. However, digital ID — doesn't just satisfy a bureaucratic function, it also plays a role in shaping how we

see each other and ourselves. Digital ID can elevate marginalized people whilst also increasing surveillance of those same populations. Digital ID can be weaponized — as is in the case in India, and its redefinition of citizenship that excludes Muslims. The requirements of the documents to confirm citizenship have only been historically accessible to certain groups and will further entrench already deep societal and class divides.

Those that are marginalized often express that their identity plays a role in how data systems treat them. That data driven systems lead to being perpetually watched, eroding human dignity, and reducing people to a 'number' or a 'data point'. Systems like credit scoring or criminal records create profiles that stay with individuals, regardless of whether they've changed as people. These systems restrict people's ability to demonstrate how they've changed, and to move past their earlier selves. Once categorized with a certain label, that label sticks, no matter how much a person's identity or behavior changes. Systems that monitor migrants movements across borders don't engender feelings of safety or belonging.

> EXPERT QUOTE: "You have no physical agency, no agency over your own body — therefore no agency over your digital body — how it is being monitored, surveilled" Dragana Kaurin, Berkman Klein Centre
> Flattening identities to fit into easily defined categories also flattens gender identities into binary categories. When unnuanced understandings of identity become cast into stone, it paints a picture far removed from people's realities, discriminating against trans people, and invisiblising intersex people.

Ambient intelligence is an amplifier of risk. The confinement and risk to vulnerable people will happen that much faster at a speed we won't recognize, meaning harder to seek justice. When this is linked to identity, broad assumptions are made of groups of people: about who they are, their needs and desires and how they choose to express them. When technology platforms are designed for the LGBTIQ community as an example (who are

not a community but a group of people forced together and bound by their shared fate), but do not take an intersectional analysis of its users (including black queer perspectives), it designs platforms for a majority stereotype. Flattening user identities forces users to also flatten themselves to fit those stereotypes in order to access connection and intimacy in online spaces.

What you see online translates to what you value in others. It undoes the years of activism for more intersectional amplifiers. Succumbing to having our identities defined for us – in ways that lend themselves to easy digitization – means we risk losing sight of who we are altogether.

> EXPERT QUOTE: "The irony of choice is how it flattens us to what we think is in front of us, to fit in. We become an avatar" David Sangokoya, World Economic Forum

MASS FLOURISHING

Mainstream discussions of AI and robotics assume that a small number of global tech firms will control the technologies that will affect the lives of massive populations. Bitter criticisms emerge of large private tech platforms that favor profits over public interest, undermining public trust. As a result, strategic discussions in AI governance circles have increasingly focused on defining ways to restrict and regulate the large corporations that lead the AI industry.

There is an alternative path for developing and deploying AI, what proponents of open innovation call "AI from the grassroots." In China, democratized ecosystems, which build on open source approaches to new technologies, have developed surprisingly active local dynamism with incentives to better connect tech with real social issues. Increasingly, AI could be considered as a tool "mass flourishing." Nations or regions can truly develop, implement and grow with new technologies only if they

maintain a regulatory environment that enables technological transfer to the grassroots level, delivering valuable products and services not only to the wealthy and powerful but also to social and economic peripheries.

Technology has helped bring communities and people the world over together, at a time when we are meant to be socially distanced and isolated. Online platforms, communities and services are booming, as more and more people turn online for all dimensions of their lives. Digital innovation and connectedness have radically transformed civic participation and democratic decision-making, democratizing information access, participation and agency. COVID-19 has sparked a new wave of mass online collaboration — from global hackathons (that sparked a wave that involving over 100 000 people from New Zealand to Brazil and everything in between in 14 days) to utilizing collective intelligence to tackle the pandemic, it is an increasingly recurring phenomenon of emergent and enduring cooperative groups, whose members have developed particular patterns of relationships through technology-mediated cooperation. It has also inspired an unprecedented surge of voluntary efforts to save and protect each other. In the UK an army of more than 700,000 people responded to the governments call to help support the NHS. Red Cross volunteers globally have been on the front-line of delivering essential health services to people affected by the disease.

More than this, people everywhere are solving their own extraordinary local risks. Where public good institutions are failing to respond to vulnerable groups that are being missed in policy design, civic-minded citizens are self-organizing and self-mobilizing to fill the gaps. The crisis has triggered a 'mass re-neighboring', allowing us to reach out and connect with people in our communities in ways that previously felt risky or uncomfortable. The burst of COVID-19 informal, hyper-local "mutual aid" groups have been cropping up globally. Often organized through Google Docs, online spreadsheets, Facebook and WhatsApp groups, these grassroots,

community-run networks are providing essential services like grocery drop offs, childcare, financial assistance, health services and more. Authors have posted live-streamed readings, and musicians have performed from their balconies and rooftops. Technologists are experimenting with drones adapted to deliver supplies, disinfect common areas, check individual temperatures, and monitor high-risk areas. And, of course, many movements are moving their activities online, with digital rallies, teach-ins, and information-sharing.

Many of our strongest social bonds are currently being formed and deepened digitally. Whether it's socially connecting on Houseparty; playdates, singalongs, religious services and Friday night discos on Zoom; by communities of strangers meeting to take care of each other on WhatsApp; by the shared endorphin rush of hundreds of thousands of children leaping around to Joe Wicks on YouTube; the fundraisers running on Facebook and GoFundMe; and the last goodbyes said via FaceTime. Our analog and digital lives are merging together in accelerated ways.

COVID-19 is challenging the social contract and civic fabric connecting us all. Can digital civic engagement then be a new model of belonging, identity and connection in the future? How can we reimagine structures and enabling environments that can foster connectedness as a salve to what we are experiencing?

> EXPERT QUOTE: "Our lives are relational, inter-relational and connected. Our individualism does not trump our pluralism and our societalism" Anasuya Sengupta, Decolonising the Internet

DIGITAL CIVIL SOCIETY, NOT DIGITAL CITIES

Cities around the world are seeking to become smart cities by using networked, digital technologies to control infrastructure, deliver and manage

city services and systems, Whether that is through city operating systems, intelligent transport systems, smart energy grids, sensor networks, sharing economy platforms amongst a myriad of technocratic visions to bring automated and autonomous action to everyday life. Technocrats talk about bringing the smart city to refugee camps, and of using predictive analytics for crime prevention. The reality though is that smart city developments are top down in nature, with initiatives imposed on citizens who are rarely consulted about their deployment. They certainly don't consider the impacts of these technocratic visions on the homeless, older people, or young offenders. Civil society actors, faith leaders, or charity workers are not included in these conversations, and they, more than technology actors, have deep seated expertise in how life is actually lived, and the kind of society people want to live in. Smart cities reduce cities to 'user needs' and 'tasks that need to be completed', and are programmable and can be rational, rather than the bigger picture: what are the moral needs? Who and what needs protecting?. Smart cities are based on the ethos of technological solutionism: an ideology that has transcended its origins in Silicon Valley and now shapes the thinking of our ruling elites. In simplest terms, it reframes complex social issues as 'neatly defined problems with definite, computable solutions'. Essentially applying digital plasters to damage: how do we solve wealth inequality? Blockchain. How do we solve political polarization? AI. How do we solve climate change? A blockchain powered by AI.

As a contra to this, we are seeing the simultaneous push towards a digital civil society — where citizens,

and civil society actors can direct how to improve the digital public realm, not private actors. We are seeing signs that demonstrate that civil society is playing a much stronger role to form digital social contracts so that public norms and spaces can be safeguarded. We see this in initiatives like Sidewalk Labs in Canada pulling out citing economic uncertainty, but arguable due to the pushback of civil society advocates and being unprepared for local

regulations conflicting with the ambitions of the initiative. The Glimmers Project is pushing us to ask questions that go to the heart of what a digital civil society structure might look like: How can civil society support

more people in a world where technology both individualizes and connects individuals, families, workers, learners and whole communities? A digital civil society framework interrogates and tries to bring the analog and digital relationships between actors in a democratic environment to a more equitable level, and we see a new wave of this — where civic collective action is adapting to digital systems. Civil society organizations are moving towards small staff, but global dispersed membership. Raising money online and paying attention to their social media channels. The aspiration is to decentralize decision-making, encouraging far-flung individuals to raise money on their own, plan their own events, and tweak the branding of the movement to fit local needs. This describes everything from #GivingTuesday to the Sunrise Movement, MoveOn to the Extinction Rebellion, political campaigns to the Digital Public Library of America

COVID-19 has fast-tracked the advent of digital civil society norms. The need more than ever for a civil society as a source of "reciprocity, altruism, fairness, sustainability, identity6" in this new digital normal we are hurtling towards.

REIMAGINING LEARNING

Artificial intelligence (AI) is a major influence on the state of education today, and the implications are huge. AI has the potential to transform how our education system operates, heighten the competitiveness of institutions, and encourage teachers and learners of all abilities.
Already, intelligent instructional design and digital platforms use AI to provide learning, testing and feedback to students from pre-K to college level that gives them the challenges they are ready for, identifies gaps in

knowledge and redirects to new topics when appropriate. As with many other artificial intelligence domains, China has already leapt to the front of the pack in in advancing AI-centered education

From kindergartens to universities, digital cameras scan students, detecting them raising hands or chatting behind the teacher's back, and facial-recognition robots take attendance and quiz toddlers. Bluetooth wristbands record heart rates and how much time a student spends in the library or on the playground. Proponents say such information can boost safety, help teachers quantify learning progress and make education more individualized. This increasingly aggressive and sometimes intrusive use of high-end technology in education is pivotal to Beijing's goal to make the AI industry a fresh driver of economic expansion. Virtually unobstructed access to a potential sample pool of around 200 million students allows Chinese scientists and researchers to amass an unrivaled database, which is indispensable to develop advanced algorithms. That provides a key advantage for China in an ongoing race with the U.S. for global dominance in the field.

Experts agree AI will be important in 21st-century education—but how? While academics have puzzled over best practices, China hasn't waited around. In the last few years, the country's investment in AI. enabled teaching and learning has exploded. Tech giants, startups, and education incumbents have all jumped in. Tens of millions of students now use some form of AI to learn— whether through extracurricular tutoring programs like Squirrel's, through digital learning platforms like 17ZuoYe, or even in their main classrooms. It's the world's biggest experiment on AI in education, and no one can predict the outcome. In a report in March, the Chan-Zuckerberg Initiative and the Bill and Melinda Gates Foundation identified AI as an educational tool worthy of investment. But experts worry about the direction this rush to AI in education is taking. At best, they say, AI can help teachers foster their students' interests and strengths. At

worst, it could further entrench a global trend toward standardized learning and testing, leaving the next generation ill prepared to adapt in a rapidly changing world of work.

> EXPERT QUOTE: "How we are going to be educating future generations and new skills required will be a driving force in post-COVID analysis" David Sangokoya, World Economic Forum

Large-scale, national efforts to utilize technology in support of remote learning, distance education and online learning during the COVID-19 pandemic are emerging and evolving quickly. It has proved to be the largest global experiment in telecommuting and homeschooling. It is already being expected that some aspects/variations of Work-From-Home and flex working arrangements will be here to stay post pandemic, as well home/distance schooling options. Millions of learners across the world are turning to EdTech platforms as schools and colleges shut down due to the COVID-19 pandemic. In India and the Middle East, EdTech companies, both homegrown and global players, have been offering their services free of charge and their numbers of users are soaring. But an important question remains. Whilst it is widely accepted that learning should continue as best as possible, does ed-tech in these times have an equity issue? While financially well-off families can afford computers and multiple devices, students from struggling families can hardly afford simple devices and may likely not have the internet at home. The data suggests that COVID-19 will have huge impacts on student learning across the world, but students in low-income countries and those in sub-Saharan Africa will be the most negatively affected. In these countries, governments have been less able to provide remote learning opportunities and guidance to teachers to address student learning needs during the crisis. In middle- and high-income countries with broad internet access and in PISA-participating countries, the impact on student learning will depend more on the quality of teaching and learning taking place remotely than on the availability

IDEOLOGIES OF CAPITALISM

"AI is best understood as a political and social ideology rather than as a basket of algorithms. The core of the ideology is that a suite of technologies, designed by a small technical elite, can and should become autonomous from and eventually replace, rather than complement, not just individual humans but much of humanity. Given that any such replacement is a mirage, this ideology has strong resonances with other historical ideologies, such as technocracy and central-planning-based forms of socialism, which viewed as desirable or inevitable the replacement of most human judgement/agency with systems created by a small technical elite." Jaron Lanier and Glen Weyl, WIRED

The overall framework of technology driven capitalism is to sink below the level of cognition. It is to be everywhere, pervasive, and perceived uncritically as part of the ambient environment. They are manifestations of a political philosophy, and if we just accept them as is, we are accepting certain market ideologies in lieu of any other. The necessity, the inevitability and the ambience of these technologies is a marketing message. They do provide lots of value to humanity but there is a deeper centrality of self-preservation of powerful interests. They will never achieve their fullest potential as long as we are considered customers and not owners. And when that shift occurs, amazing things can happen. These ambient technologies, they are tools of human development and humans develop their own capabilities to use them, we redesign them.

Digital capitalism speaks to the computerization of everything from toothbrushes to pickup trucks means that ever more of a good's value derives from the software that operates it. The know-how needed to design and build such products (and to manage the complex supply chains that actually produce them) is yet another component of intangible capital.

The growing power and appeal of AI stretches the definition of capital still further. Machine-learning programs are an odd form of quasi-labor, trained on data generated by people to do tasks previously done by people. Yet they are owned and controlled by firms in the same way a truck or computer would be. This evolution fundamentally changes the relationship between labor and capital. While the world of industrial capitalism was shaped by the conflict between the two, there was nonetheless a certain balance of power, since they also needed each other to unlock the riches made possible by technological change.

> EXPERT QUOTE: "Ambient technologies masks ideologies of power, and are profoundly wed to a market ideology of dominance, eclipsing public good by private interest" Andrew Zolli, Planet Labs

So far, a small group of companies have set the rhythm of digital transformation. This is due to a unique economic environment in which huge amounts of capital meet a specific ideology of innovation, risk-taking entrepreneurs, and a technologically highly skilled labor force. The rise of companies like Airbnb (valued at $38 billion) or Uber ($66 billion) in recent years has only been possible as they use private equity and private capital to monopolize markets and dominate. Though this might be passed off as 'disruptive innovation', it actually is technology mediated monopolies: why they innovate is not to improve on public goods. Rather they put in place systems to eliminate labor and move to self-driving monopoly. It is predatory capitalism that puts shareholder wellbeing at the center, rather than human well-being. It is a form of 'solutionism' — convincing the public that the only legitimate use of digital technologies is to disrupt and revolutionize everything but the central institution of model life — the market.

> EXPERT QUOTE: "Capital does not set out to disrupt itself, but it sets out to exploit labor in ways that it can use to make more capital. It sets out to reinforce the status quo. If you want to critique how

It sets out to reinforce the status quo. If you want to critique how technology impacts anything, you also have to critique class, racism and economics" Tim Maughan, Author
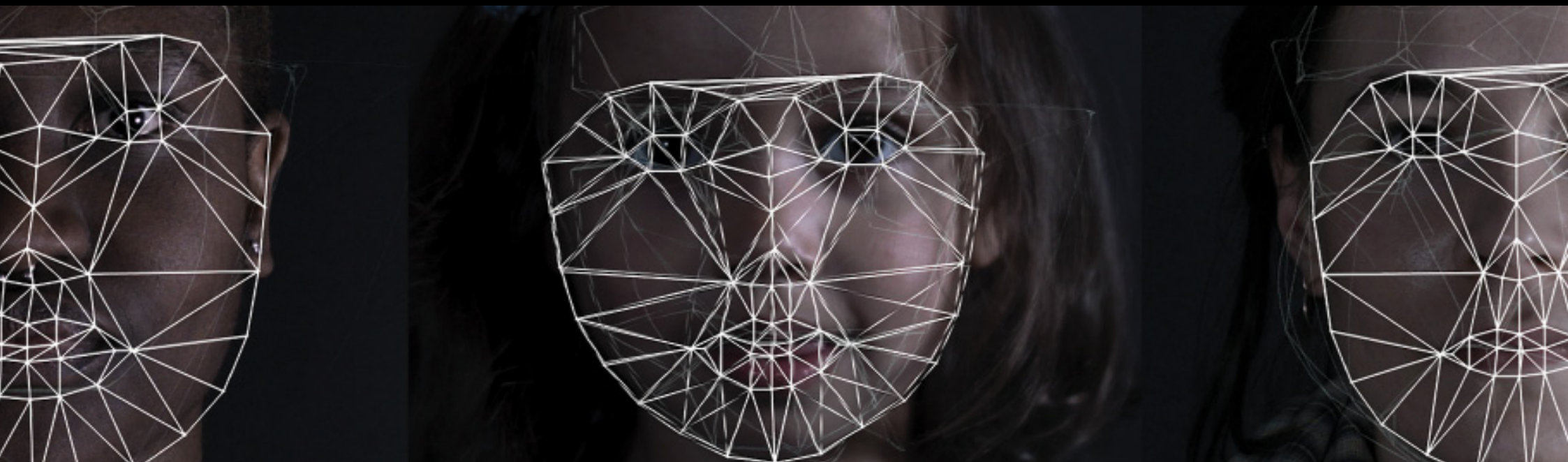
The question for humanity then is how we create the architecture of participation around these technologies and balance them with commercial interests for a more equitable, balanced market ideology. It becomes a question of choice. Technologies don't result in change by themselves — they are driven by choices. So, what kind of different choices can we make where we don't drive an inevitable future where powerful market economies use technology to deepen their self-interests.

EXPERT QUOTE: "We like to think the future is going to be like Star Trek — with tech-based solutions and convenience — but in reality technology is a shimmering curtain and we don't really understand what's behind it, and it captivates us. We blindly follow the instructions and we have stopped critically thinking about what those implications might mean. We have automated choice. And in doing so, we have delegated control about our lives and our economy, to increasingly complex networks. We have delegated decision making about us without our consent" Tim Maughan, Author

PARADOX OF CHOICE

We are at a moment in time where our commons have fundamentally and irrevocably shifted. We know we can't build back to what we were. The range of choices about the type of futures we want to inhabit — has expanded exponentially, and the choices we make now will decide our collective fates. There isn't a single linear solution. Can we therefore reimagine the possibilities that are open to us and unleash our social imaginings about the types of ancestors we want to be?

EXPERT QUOTE: "What does a set of futures look like that are translocal, some of which are connected through infrastructure, and through political and social threads. What is the plurality available to us, that through connected tissue, actually embed deeply affected values that can frame how we all see the world?" Anasuya Sengupta, Decolonising the Internet