

The next generation of tech for good

**A Winston Churchill Memorial Trust:
Fellowship Report**

Shona McElroy, 2018

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Introduction

Tech can do more to solve real problems.

New Zealand is a beautiful, thriving and enterprising country. We are privileged to call it home. We also face wicked problems such as inequality, environmental degradation, and dramatic demographics changes that affect outcomes for individuals, whānau and communities.

These issues are too complex to be addressed by business, community or government alone and so we must be open to finding solutions in different places and working together across sectors to generate new ways of working.

At the same time advances in technology may offer significant potential to improve outcomes in education, health and wellbeing, inclusion, and the environment.

How can we make the most of this potential?

By increasing our understanding of the potential, we can harness these technologies in our unique context here in Aotearoa New Zealand. We can ensure that this is not innovation for innovation's sake. Technology needs to work in service to human needs and experience. By learning and adopting world leading design methods, such as inclusive and participatory design, we can work to produce technology solutions that genuinely enhance people's lives and lead to positive outcomes that benefit us all.

The Journey

This became a much bigger trip than I first planned. With the support from Foundation North I was privileged to visit London, Copenhagen, Edinburgh, Glasgow, New York, San Francisco and Vancouver in the Summer of 2018. It was mind expanding, and enriching. And it was hot.

As I explored each city on foot or by bicycle two things were ever-present - homelessness and climate change. It reinforced that we a lot of work to do to create a sustainable, equitable society.

But I also filled with hope. I met people all over the world that are working on new ways to get us there. A global community of smart, talented, dedicated people working hard to make things better using technology. It's a global endeavour. Many of the solutions I saw solve problems for people on the edges - people marginalised by social systems or isolated geographically.

I also learned that it's hard and there's not enough momentum. Technology is only part of the solution to important, neglected, real-world problems but we have a responsibility to fully explore that potential. There are currently too many barriers.

We need to create an environment with more ambition, collaboration, and creativity. We need more diverse leadership with the skills, talent and resource to fully explore the potential. And we need to do this together, across the NGO and private sectors with funders, educators, governments and policy makers.

I am privileged work with others on this as an Innovation Catalyst at Foundation North – a community foundation committed to improving the lives of people of Auckland and Northland.

Acknowledgements

This trip wouldn't have been possible without the support of The Winston Churchill Memorial Trust and Foundation North. Thank you to everyone who gave generously of their time and energy to share all that they have learned in working to improve how we live together on this beautiful planet.

Questions and method

When I set out on this Fellowship I wanted to gain practical skills and explore strategic questions. This included practical, hands-on learning about how to design and prototype tech for good. The strategic questions were about how we create a more enabling environment for these types of solutions. I explored:

- What opportunities do the next technological advances such as artificial intelligence and virtual reality offer to address some of our most pressing issues?
- How can we ensure the people most affected by these technologies are involved in design and are well served by these advances?
- What conditions and supports do we need to create and nurture innovation in technology for social good?

I had three types of engagement:

Inspiration: I attended NESTA FutureFest and the V&A Exhibition The Future Starts Here. I saw speakers, connected with people and shared interactive experiences of technology and how it's shaping our society for better and for worse.

Practical learning: I spend two weeks at Summer School with the Copenhagen Institute of Interactive Design. Hosted at UN City in Copenhagen I gained practical learning about Connected Products and Design for Sustainability with industry leaders.

Coffee and conversations: I met with funders, labs and agencies that support technology for good innovation and start-ups in London, Edinburgh, New York, San Francisco and Vancouver.

I sought out people and organisations based on their:

- 'Birds eye view' of technology for good such as incubators, labs and consulting organisations
- Partnerships across public, private, academic and NGO sectors to stimulate and support more technology for good
- Projects that looked interesting from a distance
- Recommendations and introductions by people I met on the way

Sharing the journey

The learning that I gathered on this journey is shared on a blog medium.com/@shona.mcelroy. The findings have been shared with team members at Foundation North as they has the potential to inform how Foundation North and other philanthropics in New Zealand support tech for good ventures.

This report

This report is in five sections:

- 1. Reflections and recommendations.**
- 2. Stories of tech:** a whistle stop tour of tech for good stories. By no means a comprehensive selection but examples from the people and organisations I met.
 - Data and Artificial Intelligence
 - Connected Products
 - Immersive and Simulated Reality
- 3. What are the practices?** A high-level look at the how people are working in this space. It reflects what emerged as the best practices and what's important for people creating tech for good.
- 4. Creating an enabling environment:** How do we Create an enabling environment for more technology for good? A look at the barriers and enablers to growing the number of people and organisations using the latest technologies for social and environmental impact.
- 5. Travel Diary**



1 Realms of Possibility installation, Christopher Ratcliffe, NESTA FutureFest 2018

'It's a fascinating to me that in our lifetimes we'll hit around 10 billion people on the planet. How do we design for the 10 billion planet? I want to devote my life to that problem. How do we build systems at that scale that work for all the people by then?'

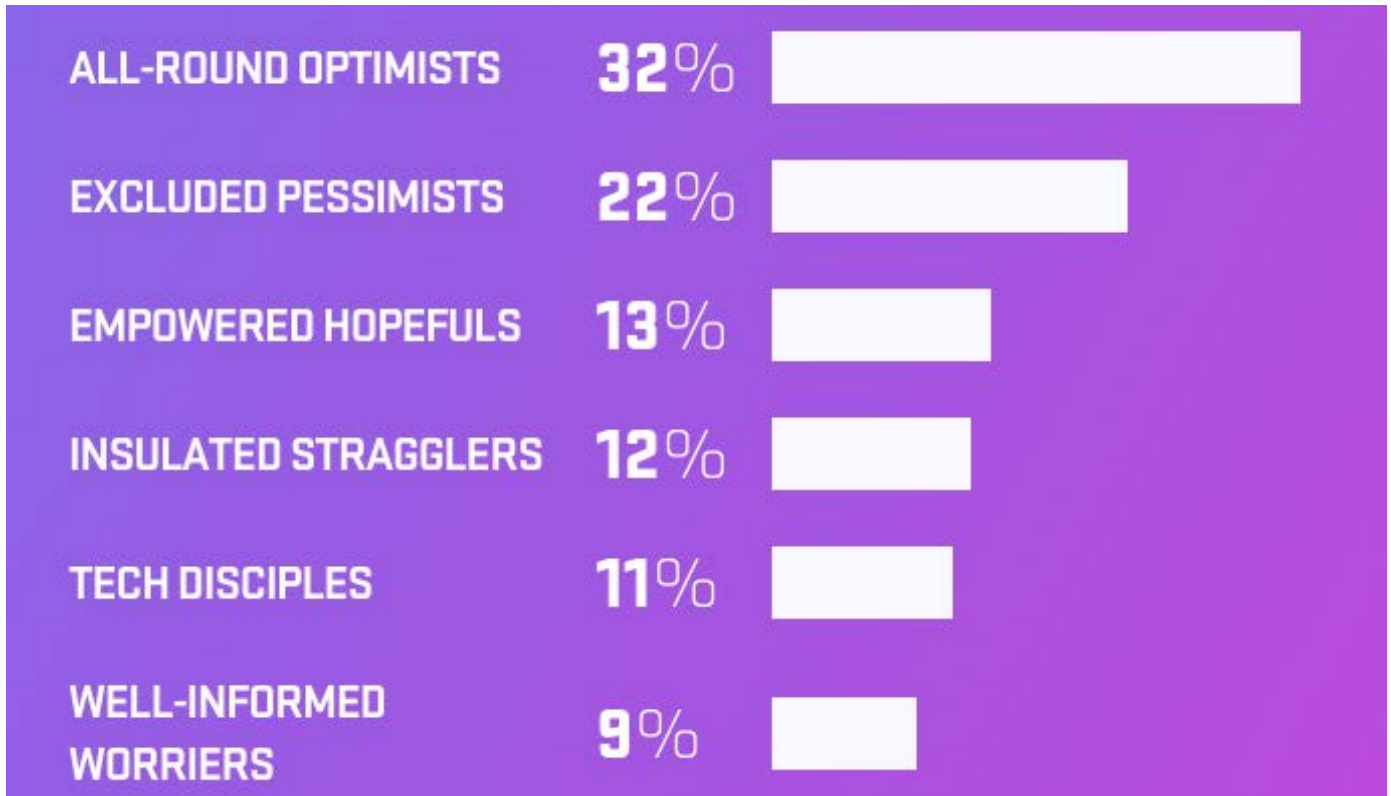
Adam Werbach, guest speaker, CIID Designing for Sustainability

How do you feel about the future?

In the bright, glass clad atrium of UN City Copenhagen the sunlight bounces off the water surrounding the building and casts a shimmer on the stark white walls. Steve Bishop, wearing a wide smile, introduces himself as a pessimistic optimist. He nods over to the corner where Andrew Lovett-Barron is distracted setting up the class computer. He introduces Andrew as an optimistic pessimistic. These are the tutors we'll spend the next week with exploring how to design for a more sustainable world.

Steve was Global Lead of Environmental Impact at IDEO. Andrew is a specialist in the design of technology in the 'public interest'. Both are inspired by the power of design to shape our world for the better.

“By 2030, demand for food may increase by 35%, for water by 40%, and for energy by 50%. Innovative



2 How Do You Feel About the Future, Poll results from The Future Starts Here Exhibition at the V&A Museum

The dark room at the V&A Museum has a white winding pathway that leads visitors on a journey of our collective future. The Future Starts Here is an interactive installation exploring technology and society. One wall of shows a bright colourful projection of how we feel about the future. It displays the live results of data collected from visitors feel after experiencing 'the future'.

Let's feed our impatience, our optimism and energy AND our knowledge and skills to take on the challenge.

These results perfectly reflect the reason why I embarked on this Fellowship. How do we grow the Empowered Hopefuls? The ones that feel they have the power to help shape an optimistic future. The pessimistic optimists like Steve and the optimistic pessimists like Andrew.

Being an All-Round Optimist isn't enough - without dissatisfaction and impatience we won't act. Neither can we rely on the Excluded Pessimists, the Stragglers, the Disciples or the Well-Informed

Worriers. Without optimism, motivation and energy and the knowledge, skills and resources to act, we won't feel empowered to make change.

How do you feel about the future? [The survey](#)¹ is still live if you'd like to find where you fall.

¹ How Do You Feel About the Future? *V&A Museum*. 21 January 2019
<https://www.vam.ac.uk/articles/how-do-you-feel-about-the-future>

Reflections and recommendations

There's undoubtedly potential. But far more than is being explored now.

The potential of the technology is not really about tech

I heard stories of new tech solutions in rural, indigenous, environmental and underserved inner-city community settings. I saw tech that sounded impressive from a distance but up close isn't as advanced or ready as the hype may suggest. I also learned about tech being used in clever ways, and delivering great impact, that wasn't the newest and shiniest technology available. The potential is in finding new applications of technology to make a real impact.

Shifting the system

The most exciting innovations I saw make life better for every person who use them *and* influence change in the system. They have customer and impact at the heart of the design. The magic is in designing for human interaction, behaviour-change and systems impact. The tech is the enabler of that change.

It's not all about the new

The people I spoke with were adamant that this untapped potential is not exclusive to this new wave of technology but held in technology in its broadest form. The new use of boring technology could be game-changing. We simply haven't had people with resources working in the space between the need (Communities, NGOs and social enterprises) and the people who can design, make and scale the technology (designers, developers and entrepreneurs).

We should to play more

The more of us that play with the technology - feel, touch, experience and make new things - the more excited, engaged and knowledgeable we will be to see the new opportunities. Let's push ourselves to keep our curiosity and explore the new.

We've systemically underinvested

It's true to say that the long standing under investment in technology across the NGO sector does us all a disservice. There is a large disparity in the amount of talent and investment in tech in private versus the social enterprise and NGO sectors. Investment is needed for exciting projects and roles to attract talented designers and technologists to the social impact sector.

Fellowships and Challenges Prizes make a great start. We also need longer term approaches to bring new skills to the challenge. Embedding the Sustainable Development Goals across business, design and technology education is a fantastic example of this.

Let's be ambitious

We know what the big challenges are. In our lifetimes we will see 10 billion people on the planet. All of us will be living in a radically changed climate. We need to be ambitious, and impatient, to design for our desired future state. Where resources are well distributed and used so we maintain our balance with the planet, and each other. It will take innovation in many of our systems. It won't be one solution but many small, radical improvements. Technology is an important enabler.

It won't happen organically

People doing this work face barriers. We need to create an enabling environment to increase the technology development for good. It needs sustained funding and tailored investment. We need to build bridges between the Communities, technologists, designers and entrepreneurs - whether that's labs embedded in communities, communities of practice, breakfasts or festivals and interactive experiences that bring the sectors together.

Embrace the potential... and the fear

Technology has great potential for good, and for harm. We need the optimists, the pessimists, the hopefuls and the worriers to help shape our technological future. We need to embrace the opportunities *and* think and act carefully to mitigate the potential negative impacts. Values and ethics need to underpin our actions.

Let's build a caring technology for good sector

We don't need to replicate the mainstream tech sector with its challenges with diversity, inclusion and ethics. We can imagine and create a new diverse and inclusive sector with a strong ethical foundation that puts people, social impact and the environment first. We can reimagine and redesign the funding and investment environment to value the real-life change it creates. We can leave behind the push for exponential growth that creates unhealthy incentives. We can be more zebra² than unicorn.

It will take partnership

All the Lab examples I visited had partnerships that were foundational to their ability to innovate. Local and national government, academia, philanthropy and private sector were all participating in collaborative initiatives to advance technological solutions for good. The need to combine resources, assets and talent and align to a common purpose was evident to all. Success in their partnerships came from having shared purpose, clarity about the value each party was bringing and a tangible commitment to a long-term vision. It was also important to give space for failure and wheel spinning at the start of projects where everyone was finding their feet.

And a long-term commitment

To increase the number of successful applications of technology for environmental and social impact will require a commitment of resources. Organisations I met valued funding that provides the

² <https://www.zebrasunite.com/>

Reflections and recommendations

breathing space to learn and adapt approached to the environment. This requires bravery from funders.

NESTA's endowment gives it the freedom to think long-term, to go where the energy is and to constantly work on the edge of what's new and emerging. The Crime Lab in New York was seeded with 4-years of capital by a philanthropic partner. Blue Ridge Labs is a program of Robin Hood a philanthropic that invests in new initiatives for poverty reduction in New York and so has ongoing support. When we look to develop these supports we need to look at least at the 5 - 10-year time horizon.

Data & artificial intelligence

In the business world machine learning and artificial intelligence is optimising recommendations (Amazon, Netflix and Google recommendation engines), enhancing customer experience (Chat bots) and identifying when your credit card might have been stolen (banking).

In the social space they're less wide-spread. Examples include machine learning algorithms to predict risk or outcomes to inform decisions about interventions and resources. In some places data is shifting the balance of power by giving those that are vulnerable the information and influence they need to change the situation.

eyeWitness, / The Engine Room

Bringing human rights abusers to justice

eyeWitness is an app created by the International Bar Association to capture verifiable eye witness evidence of international atrocity crimes.

Eye witness video evidence of human rights crimes can be challenged in court. The date, location and the content of videos can be edited after the footage was taken, making it unreliable. eyeWitness is a camera app that captures this data from three separate sources. The app creates a digital chain of custody, saved on secure servers, so files can't be edited. The evidence is reviewed by a network of lawyers to verify it for use in criminal court without the need for personal testimony that may endanger witnesses.

[JustFix.nyc](#), / [Blue Ridge Labs](#),

Improving the housing conditions of New Yorkers

Around 1.2 million New Yorkers live in "deficient" housing at any given time. These homes have mould, structural defects, pests or no heating. Tenant requests to landlords for repairs are often ignored and filing a complaint to the city can be hard to navigate. Some tenants risk eviction if they pursue landlords too strongly.

The Justfix app gives tenants a way to document and lodge the need for repairs. The delivery & receipt are traced, and the evidence can be used in a formal complaint to the City. It makes the process of making a complaint far easier. Community organisations and pro bono legal services can offer tenants support through the platform. The verified history of requests makes it far less likely that landlords will seek eviction in retaliation and the city-wide data can identify unfit landlords that consistently fail to fix properties.

[Bloodlink](#), / [CIID Nest Incubator](#)

Getting blood to those that need it

In India there is a shortage of 3 million units of blood a year. When there is a blood shortage patients must ask friends and family to donate or source blood on the black-market. Bloodlink is an app that links patients with a verified blood donor community who can fulfil the donor needs in the shortest span of time.

There are numerous challenges in getting an adequate supply of blood to people when and where it's needed including lack of knowledge and myths about giving blood, poor donor experience and supply management problems. Bloodlink developed a bot that informs donors of needs for blood close to them and helps them make an appointment to donate. It answers basic questions to debunks myths about donations and to inform new donor what to expect. Users can chat with regular donors or consult a doctor about donation.

[UN Biodiversity Lab](#)

The global biodiversity picture

The UN Development Program worked with partners to create interactive map designed to solve biodiversity conservation and development challenges. It brings together spatial data from across the world (i.e. UN, NASA, Universities) to support countries bio-diversity action.

"By providing access to spatial data - including protected areas, endangered species, human impact on natural systems, watersheds for key cities, and more - the platform empowers policymakers with the necessary information to address pressing biodiversity conservation and development challenges." Achim Steiner, UNDP Administrator

New York Crime Lab

Reducing jail time *and* crime?

75% of people held in jails in the USA are not convicted of any crime. They're awaiting trial. More than half of the pretrial jail population in New York are there because they don't have the money to pay bail. Even when bail is granted the conditions are often so restrictive as to 'set people up for failure.'

The Crime Lab NY team is made of social and data scientists. They work with NY City data provided by the Mayor's office to design predictive algorithms and carry out random control trials. The team asked:

'How good are judges' predictions about the risk that someone won't show for court or are at risk of offending whilst on bail? Can an algorithm improve on the current practice?'

Can we reduce the number of people that are held in jail unnecessarily prior to trial? Can we reduce the overall crime rate?

Currently Judges use a six-point checklist risk tool to support their decision. In practice it's used inconsistently. The aim of the project was to develop a tool to give judges a more accurate assessment of risk to support their decision-making.

Compared with actual judges' decisions the tool showed it was possible to reduce in the number of people jailed by 42% with no increase in crime with the use of the algorithm. It was also possible to reduce crime by 25% with no increase in overall rates of incarceration.

It's important to say that the use of machine learning in sentencing has [experienced severe criticism](#) due to evidence that algorithms can codify bias on sex and race that already exists in the justice system. It raises significant issues of ethical decision making. The Crime Lab team check the algorithms for bias and investigate the source in the original data. In this example it showed that, even without adjustments for skewed or biased data, the application of the recommendations of the algorithm would result in 40% fewer minorities being sent to jail pre-trial with no increase in the crime rate.

Connected Products

Connected products are networked physical devices. Products are embedded with electronics (sensors and transmitters) that enable them to interact with people, their environment, and across devices and the internet.

EcoTrust Canada

First Nations Sustainable fishing

Quinault Indian Nation is in Washington State. The Nation's crab fleet of 25 vessels deploys 10,000 crab traps per season. To limit illegal activity and gain more information population trends and movements EcoTrust worked with the Nation to deploying sensors across the sea.

For sustainable fishing management EcoTrust also has an integrated electronic monitoring system for vessels that combines data from weight sensors, video capture and GPS time and location tracking. Effectively smart boats.

Toyota Mobility Challenge Prize,, Nesta Challenge Prize Centre,

Radical advancement in mobility

NESTA partnered with Toyota Mobility Foundation to run the \$4 million Mobility Unlimited Challenge to for smarter assistive technology for the mobility and independence of people with lower-limb paralysis. One of the finalists is Evolution Devices with The Evowalk smart wearable leg sleeve that helps people with partial lower limb paralysis regain their mobility. The artificial intelligence system uses sensors to predict the user's walking motion and stimulates the right muscles at the right time to help them walk better.



3 Making connected product in Copenhagen, CIID

Making Connected Products

Designing connected products With Andrew Spitz and Ruben Van Der Vleuten, Copenhagen.

I spent a week by the water at the UN City in Copenhagen learning how to prototype Connected Products with CIID. We were challenged to work in teams to develop an idea to contribute to the UN SDGs. We developed a product to encourage greater use of reusable water bottles across Copenhagen.

Together we created a low fidelity functioning product and a demonstration video. During the course we used 3D-printers and laser cutting devices. We made a functional high-fidelity prototype phone app. We learned the basics of electronics and coding and were introduced to sensors, data collection and making data stories. We explored the real-world ethical challenges of designing data collection devices.

Beyond the joy of making a concept come to life, the biggest learning was how easy it is to start engaging with this way of making and how empowering it feels to understand, even at a basic level, how this type of technology is made. It stimulates thinking about how new connected products could be employed for social and environment change.

Immersive and simulated reality

Immersive reality

Immersive technology transports you into an experience. Research shows that powerful stories in these environments are stored by our brain as memories - with the full emotion that memories capture. These experience can be a gateway to increased empathy, compassion and behaviour change in a way that other media can't replicate.

Immersive technology is being used in advanced training where a real-world learning environment is hard to replicate such as [firefighting](#), [disaster response](#), or [training surgeons](#).



4, A student tries virtual reality, CIID 2018

Simulated reality

Simulated reality are digitally simulated spaces that people can shape and direct as they see fit. It can be used for participatory design in communities.

Sustainable Development Goals (SDG) Action Campaign

Walking through a refugee camp with Sidra

The UN included Immersive technology as part of the Sustainable Development Goals Action Campaign. Several immersive films introduced global leaders and funders to the reality of the issues. One film gave the experience of [Za'atari Refugee Camp](#) through the eyes of a young girl by the name of Sidra. The impact of screening these films world-wide has been [to raise double the expected](#) funds for the SDGs.

Block by Block Foundation / NESTA FutureFest

Designing our city space together

During NESTA FutureFest, [Gabriella Gómez-Mont](#), Founder and Director, [Laboratorio para la Ciudad](#), from Mexico City, explained how they pioneered with UN-Habitat the use of Minecraft to [Crowdsourcing Public Space Ideas in Mexico](#).

The Lab hosted an open competition where each participant was given a "plot" that represented Plaza Tlaxcoaque, a square in the historic centre of Mexico City, in Minecraft. They had three hours to complete the challenge. 7,429 young people took part, 1,438 ideas were submitted, and 431 projects were completed.

This pilot became the Block by Block Foundation. Partners include UN-Habitat, Microsoft and Mojang, the Minecraft creators. It's a charity committed to supporting participatory design in public spaces, particularly in disadvantaged communities as a precondition for poverty reduction and the fulfilment of human rights in urban areas.

Making Immersive technology

In New York at a women in tech event the Google Daydream (immersive tech) team explained how using this tech has never been easier. A 360-degree camera can be rented in most cities and the video can be hosted on YouTube or on an iPhone app. Films can be viewed on your phone with basic VR headsets made of cardboard. However, creating experiences with an emotional impact is a creative film making specialty. HT, one of the leading VR hardware and software providers has a [\\$10 million fund](#) to support the VR experiences that contribute to the UN SDGs.

What practices are used to design tech for good?

Why is it important?

How do we ensure that new technologies truly serve the people and communities they set out to serve? This is particularly important when there may be significant power imbalance between those that create the technology and those they set out to serve.

Differences in knowledge, life experiences and income create a physical and experiential distance and power imbalance between technologists, entrepreneurs and communities. How might we bridge the gap to create truly empowering technology-enabled solutions? This section distils the practices used by those working in tech for good.

1 Design with the system in mind

It's important to know the system you're working in. The most effective technology solutions work to shift the system whether that's changing the balance of power or making a fragmented, hard-to-navigate system easy for those that most need it.

2 Design for the humans you're serving

Human-centred design is the benchmark for practice by these labs and agencies. This is creative problem solving that keeps people at the heart all design decisions. It's a multi-disciplinary way of working with a wide range of tools and practices.

3 Build authentic relationships in communities

To create for underserved communities it's vital to build authentic and reciprocal relationships in those communities. Many labs establish these and act as a bridge for technologists and designers supporting high quality engagement for the benefit of all involved.

4 Make ethics explicit

Technologists and designers at the forefront of tech encounter new ethical questions every day. They are building the ethical frameworks as they go. We need ethics in tech development to be explicit, at the forefront, and to be a much wider conversation.

5 Work on access, not just product

Access is more than meeting accessibility standards, using simple language, or making sure software runs on a particular operating system. It's about the realities of whether a household or individual has access to the internet or to the necessary equipment.

6 Diversity & inclusive ways of working

There's evidence that diverse teams are more innovative³ but diversity alone is not enough, they need to actively leverage this as a strength. Design teams need to work on team performance, unconscious bias and inclusive in decision-making.

³ How Diversity Can Drive Innovation, HBR, 2013
<https://hbr.org/2013/12/how-diversity-can-drive-innovation>

1. Design with the system in mind

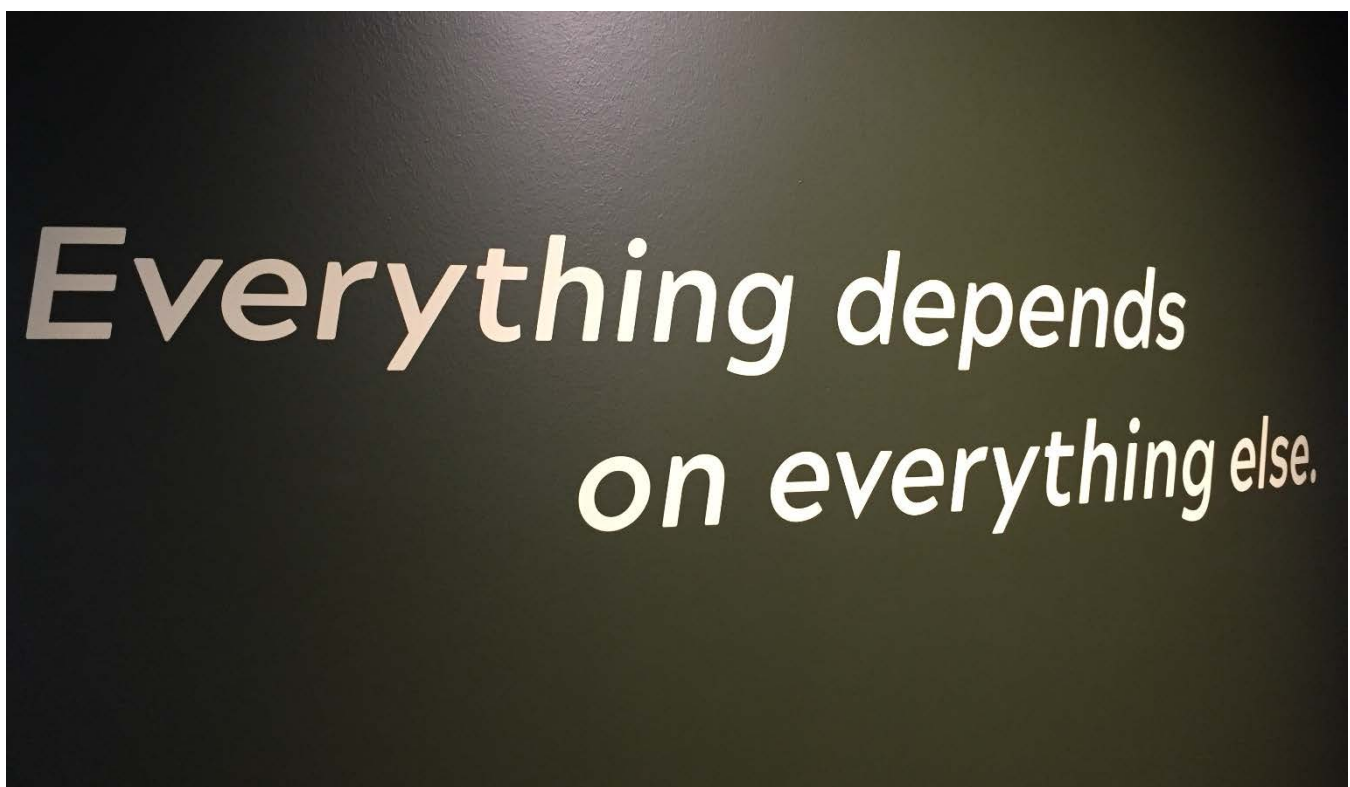
Technology is not the whole solution. Any social or environmental challenge exists in a complex system of causes and effects, people and organisations, relationships and resource flows. Any of which may contribute positively or negatively to successful change. For positive change to take place any solution needs a 'leverage point' to shift the system. It often takes an enabling or influencing role leading to behaviour change or shifting power for people who are disenfranchised.

Learning about systems change

Any tech solution needs to consider the desired effect for both users *and* the system, to create impact. This was one of the core messages at Designing for Sustainability at The CIID Summer School. Steve Bishop and Andrew Lovett-Barron, both previously IDEO designers, introduced us to Donella Meadows⁴ as originator of systems thinking through her foundational essay 'Leverage Point: Places to Intervene in a System'.

'There are no separate systems. The world is a continuum. Where to draw a boundary around a system depends on the purpose of the discussion.'

Donella Meadows



5 Raven Travelling: Two Centuries of Haida Art at the Vancouver Art Gallery

The most important lesson, they emphasised, was that top-down solutions wouldn't work. Rather we need excellent design that satisfies our needs and shifts our behaviour, from more sustainable purchasing to more efficient product use, can have an impact at the scale needed to make our societies more sustainable.

During the week our team took up the challenge to keep Copenhagen's bicycles safe on the road for longer. The idea was to create a city-wide repair movement. We developed this based on field observations and empathy interviews. We considered the attitudes, beliefs and daily habits of cyclists, city policies, scale and processes for collecting abandoned bikes, and the network of repair shops and the cost and convenience of repair. All of which informed the product design, the behaviour-change goals and the wider impact. As a team we hotly debated both the potential positive and negative impacts of our concept.

Data Driven Farming in Nepal, NESTA Challenge Prize

The Future of Food, Designing for Nepalese farmers

NESTA Challenge Prize Centre supports any Challenge that brings new talent, and solutions to a problem. The purpose of the Data Driven Farming Challenge in 2018 was to help Nepal realise its potential to be a sustainable food surplus country. The aim is to reduce poverty through sustainable livelihoods whilst maintaining environmental sustainability.

The Challenge set out to bring digital technologies such as sensors, geospatial imagery, mobile financial services, and data analytics to Nepal to make agriculture more precise, productive, resilient, and profitable for smallholder farmers.

Key to bridging the gap between technologists, Nepalese farmers and the system in which they operate was for the Challenge Team to:

1. Deeply understand the local context for farmers in Nepal
2. Identify and share potential areas of leverage in the system
3. Articulate the challenges of implementing digital solutions in Nepal
4. Bring finalist teams to Nepal to co-design with smallholder farmers
5. Use prototyping to test and improve solutions with these farmers



6 Design Mantra, CIID Summer School

2. Design for the humans you're serving

From my discussions it's clear that human centred design (HCD) remains the benchmark for product and service innovation. It's the application of design process for creative problem solving that keeps people at the heart all design decisions. It promotes rapid learning and iteration through prototyping and real-world testing.

All the innovation organisations I met use, or support others to use, human-centred design.

'Agile doesn't work when people are in a vulnerable position'
Benetech

'We support team to use human-centred design. Teams that spin out bake this into their DNA. It reduces the need to make big pivots later in their development' - Blue Ridge Lab

The field of human-centred design brings together a wide variety of practices under a single heading. The people I spoke with consider it essential to any technology development. Particularly when designing technology and service solutions where none has

existed before, and users may be considered potentially vulnerable or hard to reach (e.g. living with dementia or severe physical disabilities). It also provides the foundation for innovation that may have multiple stakeholders, users and potential customers. All need to be considered, understood and potentially involved in the design process.

The people I met were also clear that the 'move fast and break things' approach that was made famous by Facebook does not apply in this space. Rapid iteration can leave people behind. If a venture takes a new direction it must take care that it doesn't leave people - particularly people in vulnerable positions - behind.

Resources

Mindsets and 'ways of being'

Innovators need more than the right tools and process for design they need the mindset and 'ways of being' that enable them to see below the surface, question and test their assumptions and move forward in uncertainty. Check out [IDEO Design Kit Mindsets](#).

Designing for behaviour change

There is additional complexity where design needs to go beyond simply getting users to engage (for examples to buy or to spend time on a platform) but also adopt positive behaviour change (such as to save money or change exercise habits). This is when it's vital to understand the core beliefs, motivations and attitudes that often sit under the surface. See [David Sherwin's Designing for Positive Behaviour Change](#) presentation.

Design process and activities

There is a wide-ranging set of practices, tools and processes for human centred design. There are a range of places to view these including IDEOs [Design Kit Methods](#), HBRs [Taxonomy of Innovation](#) and NESTA's [Six Principles for Experimental Practices](#).

3. Build authentic relationships in communities

To develop new solutions for communities, particularly underserved communities, it's vital to build authentic, respectful and reciprocal relationships with the people for which you're designing.

Many of the innovation labs and challenges establish these relationships in community and act as a bridge for designers, entrepreneurs and technologists. They support high quality engagement for the benefit of all involved. There are several benefits to having a team or organisation actively work with a community over time. These include:

- Generating a collective understanding of the challenges faced by communities and identifying new spaces to innovate.
- Establishing common terms of engagement that value people and keep them safe e.g. such as paying participants for interviews or product testing.
- Building capacity of innovators to do this engagement well e.g. capacity building in HCD and community engagement.
- Providing individual innovators with a short-cut to connecting with, and learning from, community to accelerate the opportunities to innovate.

This is an approach that can work for place-based communities and for communities that have shared interests and needs e.g. people with dementia. Lab teams either base themselves in the location and/or build strong relationships with people and organisations that work on the ground with the community of interest.

Through these relationships' teams gain an insight into the people, their lives, and the issues that are important to them. This can lead to new opportunities for creative solutions. The lab can then call out for new ideas and talent to challenge.

This 'bridging' role often comes with capacity support for teams to use the human-centred and systems design practices. The Lab maintains high standards in the engagements and ensures that the teams work well and collaboratively with the people and communities they seek to serve. The result is that more ideas can be tested, more quickly, while communities and relationships remain the priority. Examples from organisations visited:

- [Glasgow School of Art Innovation School, Highlands Creative Campus](#)
- [Blue Ridge Labs @ Robin Hood](#)
- [Songhees Innovation Centre](#)
- [EcoTrust Canada, North Coast Innovation Lab](#)

4. Make your ethics explicit

Technology might be viewed as objective and utilitarian, but every decision made in shaping technology is informed by the values and perceptions of the human that created it.

The context in which technology is built very much shapes the result. Are the values and ethics explicit and address the inequalities that may result in the design and application of the technology?

On the new frontier of technology there are no well-established and broadly agreed ethics. Many of the technologists and designers that I spoke with thought the topic was important. Most articulated their personal or organisational values which act as a north star for ethical decision-making. But few have formal ethics guidelines and tackle the ethical issues as they arise.

The following examples illustrate different approaches to hard ethical discussions.

UN Development Innovation Facility

Collaborating for ethical transparency

The [UNDP Innovation Facility](#) leads the UNs innovation in data and artificial intelligence. They joined the Partnership on Artificial Intelligence (AI), a consortium of companies, academics, and NGOs working to ensure that AI is developed in a safe, ethical, and transparent manner. The UNDP Innovation Facility sees these partnerships are spaces where 'all of the parties can explore and nut out the issues' together.

Frolic Studio

A manifesto for the internet of things

When [Frolic Studio](#) started the team found many of their clients are embarking on the design of connected products for the first time. They had not encountered the ethical considerations before. Frolic Studio partnered with other design firms to develop an [Internet of Things Manifesto](#) that sets out the values and ethics they apply in design. The Frolic team walk clients through the Manifesto at the start of any new design project to get aligned on the ethical practices for designing connected products.

'Technology is not good or bad. It's not neutral either.'
Melvin Kranzberg

Crime Lab NY

A context approach ethics

[Crime Lab](#) and University of Chicago Urban Labs, don't have a formal code of ethics. They have a quasi-regular working groups to advance their ethical thinking and practice. The team believe that ethics cannot be considered in isolation to the environment of the project or intervention so make assessments about the ethical challenges for each project.

When it comes to using algorithms to support decision-making the team look for opportunities where outcome can be better for everyone. As a rule of thumb this means the result would be an increase in the provision of an effective intervention, or reduction of unnecessary intervention, rather than a reduction of needed supports or resources. They also use 'what's the current

Ethical questions in predictive analytics

Some ethical considerations based on conversation with The New York Crime Lab:

- How do we ensure that algorithms don't perpetuate bias if they're based on data that represents a biased system (i.e. oversampling of ethnic minorities)?
- How are they used in practice? Are they used to inform decisions together with other forms of human intelligence also applied?
- How do we ensure that people remain accountable for decisions based on these recommendations?
- If an algorithm is a 'black box' how can the recommendations (and potential underlying biases) be challenged?
- How do we maintain high ethical practices (both technical and behavioural) once an algorithm has been deployed and no longer has the oversight of the designers and creators?
- If you can predict harm, such as potential for becoming a victim of domestic violence, should you pre-emptively intervene? What would interventions look like?

5. Work on access, not just product

Access is more than meeting design accessibility standards, using simple language, or making sure software runs on a particular operating system. It's about the realities of whether a household or individual has access to the internet or to the necessary equipment to use these new solutions.

We need to collectively work to improve access to these technologies. The UNDP Innovation team are explicit that they don't support the innovation if the technology increases the digital divide.'. But the potential bigger than making sure no-one is left behind. The greatest innovation may come from the unexpected places, from people living at the edges.

Future proofing tribal digital connection

First Nations Technology Council

British Columbia is a vast area of rugged terrain. 30% of communities in rural B.C. have access to 50Mbps internet.

Denise William, CEO of First Nations Technology Council based in Vancouver explains to me that the economy in B.C. has historically been resource extraction such as forestry and fishing with little value add. There are now more jobs in technology than in the traditional resource-based economy combined. These jobs are in the areas concentrated around Vancouver. There's the need for 35,000 technology workers in B.C. by 2021.

First Nations people need to be part of that growth. They need skills and access. The First Nations Technology Council is working with partners to map the connection speed through decentralised network of Raspberry Pie computers. These tiny computers cost around \$50 NZD. These computers have been set up with First Nations Tribes across the vast B.C. landscape. They measure local connectivity and feed txt files to a database every two hours to get a real picture of the issues.

That will be the more comprehensive map of the connection quality. The data will be collected and stored on Tribal land and used as the basis to lobby and innovate for greater access.

“Access to the spectrum is controlled by commercial providers. Access to the network is incredibly expensive. The tribes that have access are paying upwards of \$9 million a year. That's not sustainable. ”

“We're only interested in a future proofed solution and fibre may not be that. We're investigating how to use low flying satellites to provide connectivity in remote areas. These satellites burn up in the atmosphere and so need to be replaced annually. That's why the affordability is dependent on the reusable rockets by Space-X.” Denise Williams

6. Diversity and inclusive ways of working

There's evidence that diverse teams are more innovative⁵ but building diverse teams is not enough, they also need to function in a way that values and actively leverages this diversity. Design teams should work on team performance, identifying unconscious bias and inclusive in decision-making.

Your background influences what you see and hear, what you feel is important and every design decision you make. Design teams that acknowledge this and actively leverage these different perspectives as a strength will perform better.

At the Copenhagen Institute for Design Mary Paynter and David Sherwin shared their lessons on how to build the collaboration, communication, creativity and critical thinking of design teams. One component was to strengthen the muscle of seeing our own bias. This involved a simple team observation task in the field. The team went to a public space and spent 10 minutes writing notes on what they observed. The team compared what they had seen. The range of observations was startling. It was a simple but powerful demonstration of how our personal background and experiences shape what we see, and don't see.

The team was asked to reflect on the individual biases they had shown. These included a detail orientation or a narrow scope such as only seeing or observing the people and not the environment.

Unconscious bias

Unconscious bias is where the brain makes quick decisions based on prior experience. It's a human evolution that helps us to deal with complexity and it's the dominant way we make decisions. But

⁵ How Diversity Can Drive Innovation, HBR, 2013 <https://hbr.org/2013/12/how-diversity-can-drive-innovation>

'invest and work with people that operate in an inclusive way as organisations. These are the ones that will make the big shifts.'

Open Democracy Foundation

it can leave us in the dark about what we don't see or comprehend and lead to poor results when we design for others.

Diverse & inclusive design teams:

- 1.** Team: Build a diverse team with a wide range of backgrounds and experiences including culture and gender.
- 2.** Culture: value diversity and inclusive behaviour in teams. Understand bias, develop shared expectations of behaviour and have the team hold each other accountable.
- 3.** Process: Embed inclusive practices and rituals into the design process, especially decision-making. This is the practical application of inclusion that mitigates bias and reveals the full power of diversity.

The Sherwin's propose practices to create high performing diverse teams including creating explicit team norms with shared commitments to how and when teams will work together, dialogue processes to enhance inclusive communication and the collective creation of decision-making frameworks.

Creating an enabling environment

This section gives advice to funders and agencies about how to support the growth of more technology projects and ventures to address the big challenges.

People who understand the challenges of our age, don't necessarily understand how the tech could help to solve those challenges. And the people who have the skills to build new tech solutions don't see the challenges where new tech could add value. We need to bring those people together so that we can create a community that understands both the problems and how to create the solutions.

Civic society and the tech sector in Scotland have no engagement but there is huge opportunity. Scotland has generated world-class tech ventures. Now is the opportunity to build the relationships across sectors.⁶
- NESTA Scotland

We need to promote activities that build links across sectors and bring more talent and skills to the challenge.

⁶ Why Aren't there More Collaborative Platforms for Social Good, Peter McColl, NESTA, 12 January 2019. <https://www.nesta.org.uk/blog/why-arent-there-more-collaborative-platforms-social-good/>

How do Labs, Challenges, Incubators and partners tackle this challenge?

1 Inspire

An important part of stimulating more innovation is exposing people to new ideas and expanding horizons. By interacting with new tech for good solutions and sharing new ideas people can be inspired to explore the edge of what's possible.

2 Build bridges

To develop new solutions for underserved communities it's vital to build authentic, respectful and reciprocal relationships. Labs establish these relationships and act as a bridge to bring together the community, designers, entrepreneurs and technologists.

3 Attract new talent and ideas to a challenge

Tech for good opportunities are not always visible to entrepreneurs and technologists. Some labs carry out the early stage investigation and scoping of an issue and then incentivise talent and teams to bring new ideas to meet the need. Design & tech education that focuses on social and environmental impact can also bring new talent to the biggest challenges we face.

4 Share knowledge and expertise across the system

Developing tech for good is hard and requires a diverse range of skills and knowledge to navigate the untrodden path. Some Labs and Challenges lead the early research and exploration of problems such as financial disenfranchisement to accelerate the progress of teams to generate and test new ideas. They can also provide access to experienced, specialist talent such as a human-centred designers, or a Chief Technology Officer (CTO) can be vital to success.

5 Fund strategically and support sustainability

It can be challenging to find a market of enough size to sustain a Tech for good solution. Before becoming successful entrepreneurs often take the personal financial risk to move their ideas forward. Even when they become successful its not-for-profit models mean that they don't maintain a share in the financial success of the venture. Tech for good solution need values aligned, staged risk capital to start and grow.

6 Partner

Partnerships are needed to bring the right talent and resources to the challenge. Governments have resource, access to data and can become customers for effective solutions. Academia and learning institutions can bring technical expertise and build talent. Philanthropy can take a risk on labs and the innovations that spin out. Impact investors can value impact and inclusion in new ways. Community organisations have a unique connection into communities and a birds-eye view of complex challenges. Private sector companies have most of the worlds technology expertise. Aligned for a common purpose and partnering effectively these assets can be a powerful force in creating new solutions.



7 NESTA FutureFest 2018

1. Inspire

An important part of stimulating more innovation is exposing people to new ideas and expanding horizons. By sharing new ideas and practices people are more likely to see opportunities.

Horizon scanning

A horizon scan explores what the future might look like to understand uncertainties better. It's not about predictions, but systematically investigating future trends. Sharing stories of how technology is being applied at the leading edge helps us all to understand what's possible and to shape what happens next.

Examples: Horizon scanning

The [Nesta Futurescoping](#) team explore trends, technologies and early signals of change to identify the drivers shaping tomorrow. In recent years exploratory work has included the potential of [artificial intelligence](#) (AI), virtual reality, and the [impact of automation](#) on work.

[The UNDP Innovation](#) host conversations with experts in topics such as Blockchain and AI and focus on the practical aspects of making it happen. Hosted and live streamed from New York at least once a month. There is a growing resource of videos [here](#).

'These are not conceptual talks. We want case studies and lessons learned that people can apply in their work. The aim is to expand horizons, broaden ideas about what is possible, and it often stimulates new questions.'

The UNDP Innovation team



9 Designing for Sustainability team work, CIID Summer School

Learning experiences

Giving people interactive experiences of the next generation of technology can ignite the imagination and get a real-world view of the realities under the hype.

Examples: Learning experiences

NESTA FutureFest is a two-day festival to explore ways to make a better future through immersive installations, interactive debates and inspiring talks from creative and tech leaders. The 2018 festival had 4,000 visitors. The sessions are shared publicly on [the website](#).

V&A The Future Starts Here at the V&A Museum in London was an interactive exhibition with the latest technologies, from smart products to satellites, and how they do, or could, shape our society.

2. Build Bridges

Bring together the community, designers, entrepreneurs and technologists

To develop new solutions for communities, particularly underserved communities, it's vital to build authentic, respectful and reciprocal relationships with the people for which you're designing. Many Labs, challenges and incubators establish these relationships and act as a bridge – bringing together communities with technologists and designers.

Importantly these are not short-term bridges or one-off events such as hackathons. These organisations and activities act as the long-term backbone for innovation. New issues, technologies and ideas may be explored over the life of the lab or through different challenges but the commitment to the issues remain. The learning is retained and contributes to ongoing improvement and innovation.

Examples: Build Bridges

[Crime Lab New York](#) builds relationships with NGOs understand their work and the communities they work with. They work together to find opportunities for data and machine learning applications. It often takes time to build shared understanding of what's possible and what it will take to make it work.

[EcoTrust Canada North Coast Innovation Lab](#). EcoTrust establish 'disposable' Labs for 4-years in communities. They work closely in and with the local community to find opportunities to find opportunities to innovate. The team have the skills to test and develop new technology and will launch a new venture if successful.

[Blue Ridge Labs Design Insight Group](#). The Lab manages a program that brings together community members to participate in design research and product testing for new innovations by Fellows. Members are recruited, screened and paid for their contribution.



10 The Sustainable Development Goals, CIID Summer School

3. Attract talent and new ideas

Opportunities for new solutions are not always visible to entrepreneurs and technologists. Especially challenges in underserved communities.

Some challenges and labs carry out the early stage investigation and scoping of an issue and then incentivise talent and teams to develop new ideas to meet the need.

Design & technology education with impact

Another approach is to harness the energy and talent of early career designers, technologists and business people by engaging them in the biggest challenges we face during their education. They may create new projects in existing organisations or create new ventures. They may also take their knowledge and concern for the biggest challenges into commercial jobs.

Their influence on the design of mainstream products and services to be more sustainable or have greater positive social impact may in fact have more of an impact than standalone endeavours in the long term.

Examples: Attract talent and new ideas

100% Open specialise in open innovation. This is a way of opening design challenges to ideas from expert and non-expert contributions. The team collaborated with Crisis UK to generate ideas to end migrant homelessness. They used a crowdsourcing platform [Crowdicity](#) to support homelessness specialists and workers from 20 different organisations to innovate together. Working collectively online they mapped existing initiatives, generated new ideas and voted on ideas. They then ran workshops to develop the top ideas.

NESTA Challenge Prize Centre

run challenges to bring new talent, ideas and solutions to a problem. The team will scope the problem and structure the prize, process and support to incentivise teams from around the world to enter. Challenges Prizes have been run for antibiotic resistance, the future of drones in UK cities, and products for mobility and smart ageing.

Blue Ridge Labs Fellowship

pays talented technologists and designers to spend 4-months in New York to create new solutions for people that experience poverty. Fellows carry out 2-months intensive, community-centric research to stimulate ideas. Then they spend 2-months to build, test, and launch ideas. If the idea succeeds they may launch a new venture.

Examples: Design & technology education with impact

Glasgow School of Art Innovation School

have masters level innovation education. The school has industry partnerships real projects for students and researchers. One examples is the Digital Health & Care Institute (DHI) where designers and researchers run innovation projects for health challenges. The School has a demonstration environment – a space for collaborative design with citizens.

Copenhagen Institute for

Interactive Design [master's program](#) and international [summer school](#)'s in Copenhagen, Costa Rica and Kochi India. All courses are taught under the UN SDG framework. Participants are supported by industry talent to apply processes, skills, and tools to address current challenges and better understand the impact of their contributions to the goals.

4. Share knowledge and expertise across the system

It's clear there are additional skills and practices needed to work in this space.

Even the most well-rounded teams will need access to external expertise and to develop new skills to navigate the in creating a sustainable venture. Teams need to:

- Connect, and work, with potentially hard to reach people & communities
- Use human-centred design to develop products and services
- Understand and work with systems: stakeholders and dynamics
- Build tech, a business model and attract investment
- Make legal and structural decisions
- Create business and impact strategy
- Scale operations

Access to experienced talent

There are advantages to exploring, testing and growing new solutions from existing organisations. The innovation is supported by existing organisational resource, brand, networks and capacity and isn't fighting for survival.

There are also downsides such as competing internal priorities, and potentially slow decision making and risk aversion. Organisations that are not experienced in either technology or venture development may struggle to understand how to develop the technology and/or the commercial model to sustain and grow the technology into the future.

Augmenting the team with the technical, design and business skills and supports may be essential to success whether the team is within an existing organisation, or a start-up.

Examples: Access to experienced talent

An enabling environment

Blue Ridge Lab Catalyst has an experienced start-up CTO that works in-house with incubated ventures. This offers selected start-ups access to extensive knowledge and expertise to create a product roadmap. They'd be unlikely to attract this level of expertise alone. It also offers the lab and funders a very cost-effective way to support several ventures at once.

The Engine Room works alongside social change agents to make the best use of data and technology for impact. The Engine Room don't execute technology projects but the work alongside organisational teams, for up to 18 months, to design and implement a data and technology project and increase the organisations technical and digital project management abilities in the process.

Shared research & exploration

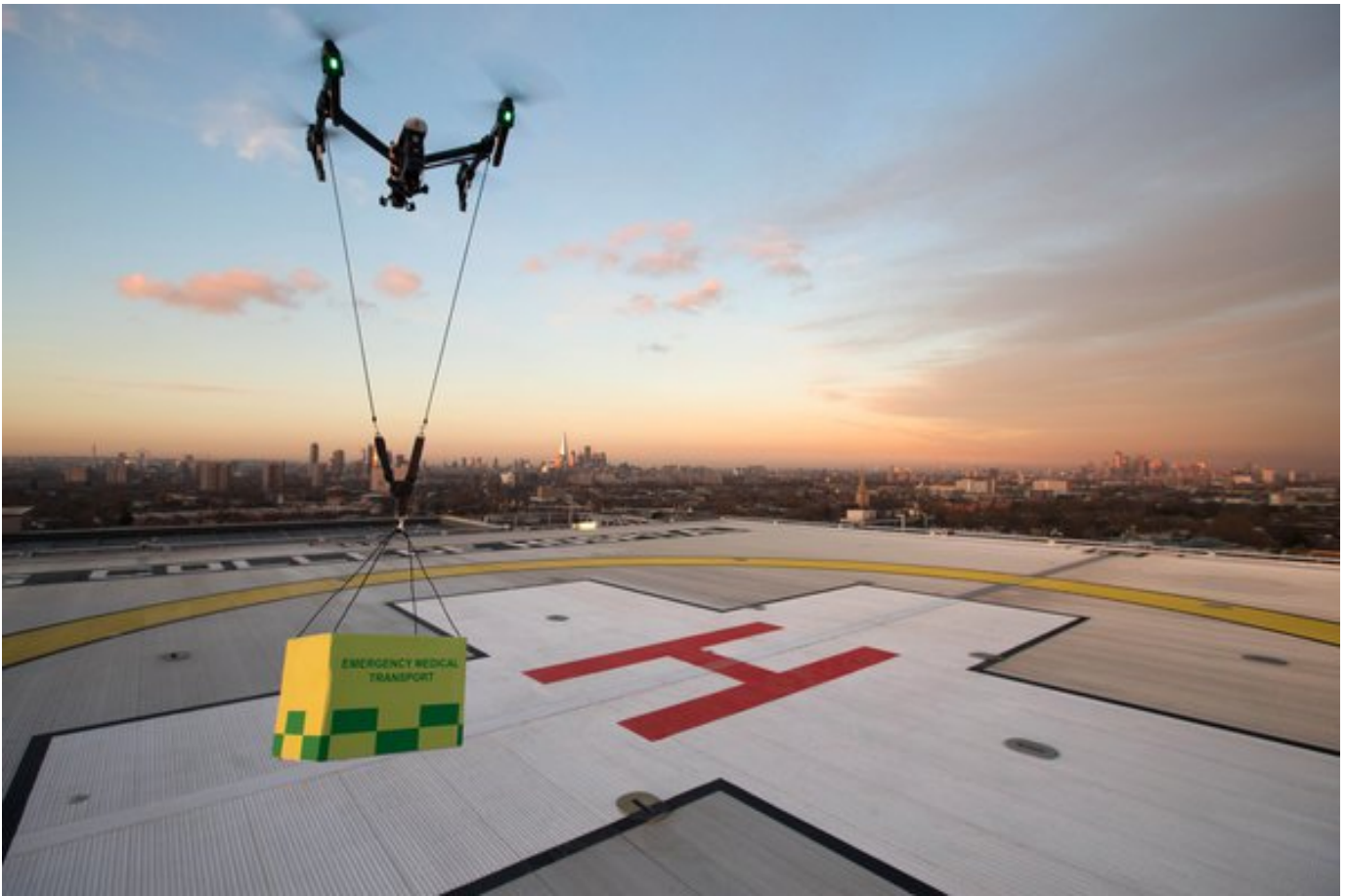
Where issues are complex funders, labs and support agencies can move everyone forward by researching an issue in-depth. Technology and issue experts can uncover the opportunities and issues of working a complex system. This means that organisations or entrepreneurs don't have to do this legwork alone. It can also be shared broadly to support and encourage new ventures and shortcut the learning process for everyone.

Examples: Shared research & exploration

NESTA Challenge Prize team ran a collaborative engagement with cities, technologists and researchers, government, and citizens to shape the future of urban drone use in the UK. A complex space that individual ventures couldn't navigate alone.

The Engine Room took a deep dive into technology use in human rights. It raised the potential and challenges for organisations that use tech in the space.

McKinsey mapped the use of AI for social good. It's a wide scan of ways that AI is being used.



11 NESTA Challenge Prize Centre work on Drones, Photo David Parry (PA Wire)

Support knowledge sharing

Communities of Practice are a group of people that learn together. Collaborating and sharing learning can assist whole sectors to move forward with tech.

Examples: Support knowledge sharing

Good Tech Lab is a global community with a lively Slack channel (online communications) to share the latest research and events and discuss emerging themes in finance, acceleration and sustainability

The Engine Room hosts communities of practice through events, collaborations and conversations with groups that share an interest in common areas of tech and social issues.

5. Fund strategically and support sustainability

The dynamics don't encourage new technology for good entrants. There are several challenges.

Market challenges

When innovators create new solutions, they can quickly hit the challenge about who will pay for their solution. Sometimes there is no obvious customer, just a big problem. Often there are customers, but the market is small, niche and fragmented such as with mobility or disability. Sometimes customers simply don't have the ability to pay. Benetech, the San Francisco based social enterprise, explicitly enters markets where they see that commercial operators won't go because of insufficient commercial return.

As a result, there can be a long customer development process especially when they need to develop a multi-sided businesses where one customer uses the product (for example member of the public using a blood donation app) while another buys the outcomes (health department of government). It becomes vitally important for innovators to demonstrate the impact they must secure outcome-focused customers.

The cost of bootstrapping

Prototyping with technology can be relatively fast and cheap but developing market ready technology is a costly endeavour. In the private sector entrepreneurs invest their own time and resources to be repaid later through profit share or from the sale of the business.

However, in a not-for-profit venture there is no promise of future financial return for entrepreneurs - other than a salaried position once they're financially secure. In the absence of 'sweat equity' entrepreneurs take the risk without compensation for their time and resource investment. Even if the entrepreneur retains equity in

An enabling environment

a for-profit model the 'impact' markets is less likely to provide the returns of a commercial venture though the personal risk remains.

Social entrepreneurs are undoubtedly more motivated by the potential impact of their endeavour than the financial gain. But motivation isn't enough. These are real material barriers that can prevent entrepreneurs from setting out to create a new venture. If you can't sustain yourself financially for at least 6-months to 2-years without an income there are few options.

Early investment is necessary, especially if we are interested in seeing diversity in the people leading innovation.

Misaligned investment

Existing sources of capital are not well suited to supporting tech ventures that is motivated primarily for impact. There are few funders that adequately support these types of ventures.

On the one side there are Venture Capitalists (VC) in the commercial technology space that expect to see a ten times financial return to take on the investment risk. That rate of growth is not possible, nor desirable, in these tech for good spaces. Especially if the commercial motivations of investors undermine the values and impact focus of innovators.

A number of people I spoke to hope to see the global [Zebra movement](#) gain further momentum to shift VC finance away from tech companies focused on exponential growth towards start-up companies that value inclusion, sustainable prosperity, and shared value for the public and communities.

On the other side are philanthropic funders that have a depth of experience in social and environmental challenges but typically lack the knowledge of the technology environment, tech development and business creation needed to make sound funding decisions.

There's a need for more funders to look at blended finance options from equity to grant funding for tech development. The Robinhood Foundation and UNDP Innovation Facility both

demonstrate how funders can step into technology spaces using alternative finance.

An enabling investment environment

1. Provide staged capital to ventures

Funders can support the pre-venture stage of development by supporting horizon scanning, research, Labs and Fellowships as discussed previously.

After this initial proof of concept stage tech ventures need funding that will follow them as they grow and develop. The people I spoke to emphasise the need for funding that:

- Supports the iteration of ideas based on learning from the field
- Doesn't undervalue or underestimate the investment needed
- Doesn't tie teams to a non-profit or for-profit structure in early development
- Is staged, with additional funds available upon measurable progress, so they're not left with a funding cliff
- Provides growth funding or investment based on proof points and impact metrics

Beyond early stage innovation funders also need to consider their role in later stage growth and ongoing development of ventures. Even product and service innovations that generate revenue from customers can take years to become sustainable. And sustainability may also mean that philanthropic funding remains a part of the model.

Even successful ventures will need ongoing investment to develop new products or enter new markets. Funders have been accused of being overly attracted by innovation with not enough support going to the later stages of growth, scale or existing solutions⁷. Forward planning is needed to ensure that any new solutions are

⁷ Winners sum up mood in biggest grants survey, *Our Community*, Jan 15 2019, https://www.ourcommunity.com.au/general/general_article.jsp?articleid=7427.

supported to become established, effective and tomorrow's business as usual.

Example: Provide staged capital to ventures

Blue Ridge Labs has three levels of funding: proof of concept, accelerator and venture philanthropy. The level and type of funding matches the proof points and risk level associated with the stage of the venture.

2. Focus on the business model

The business model is important whether the innovation is created by an existing NGO or is a start-up venture.

Blue Ridge Labs and the CIID Incubator support start-up ventures with structured business, customer, tech and impact in their incubator programmes.

Existing NGOs are more likely to seek agency support. One of the areas that agencies feel is frequently neglected by NGOs is a long-term plan for sustaining the innovation. Particularly where tech isn't business as usual and building sustainable ventures is not a well-trodden path for the organisation.

According to people I spoke with the options to commercialise the IP are often under-explored. Commercialising and scaling these solution would help the whole sector build on, and leverage, successful technology platforms (for example using APIs).

Established organisations with experience in creating spin out companies prioritise the venture development. They have the capacity to invest in early discovery work and then attract investment once the venture shows potential following pilots with customers.

Examples: Focus on the business model

EcoTrust Canada pilot technology innovation in response to identified community need. If the concept shows potential it becomes a spinout company. EcoTrust remain a significant shareholder. They offer equity to the team that will drive the new start-up venture and attract angel and impact investors to fund the establishment and growth of the company.

Benetech invest their own capital to seed new ideas. At any time, Benetech has dozens of possible projects for technology for social benefit. Roughly once a year, they work through these projects and pick those that are ready for more investment. Ideas are assessed against criteria many of which consider the business feasibility of the concept.

3. Build a route to customers

Less frequent, but arguable most helpful to tech entrepreneurs, is to create a route to secure customers once they have proven ability to solve a problem.

Example: Build a route to customers

NESTA Challenge Prizes highlight issues and stimulate innovation that isn't otherwise happening. At the early stages of creating a challenge they will investigate the current activity in the space and engage with funders, stakeholders, users and policy makers as well as potential customers. If innovations demonstrate results in the field during the challenge have a natural route to market.

Early in the design of the Challenge the NESTA team will test with potential entrants the level of funding, connections and support that are needed to incentivise them to apply.

Often these Challenges have multiple rounds to select finalists. These finalists access seed funding and support. Multiple winners may share equity-free and untagged funding.

6. Partner

For these labs, agencies and challenges partnerships were core to their ability to stimulate and support innovate. Local and national government, academia, NGOs, philanthropy and the private sector were all participants. The combined resources, assets and talent and aligned to a common purpose is a powerful force. Examples of partnership can be seen throughout this report.

“As a global community, we face questions about security, equity and human rights in a digital age. We need greater cooperation to tackle these challenges and mitigate risks.”

*UN Secretary-General António
Guterres*

Successful partnerships came from having shared purpose, clarity about the value each party was bringing and a tangible commitment to a long-term vision. It was also important to give space for failure and ‘wheel-spinning’ at the start of projects where everyone was finding their feet.

Examples: Partner

Crime Lab New York

The Crime Lab is an initiative by The University of Chicago and is funded by philanthropy. Crime Lab NY has a partnership with the Mayor’s Office giving it unique access city data. This unique access is the basis for predictive algorithms that they create in partnership with NGOs.

Travel Diary

London, UK	
<p>The Engine Room Alix Dunn</p>	<p>The Engine Room is a group of technologists, researchers and community organisers. They help activists, organisations, and other social change agents make the most of data and technology through support to adopt new tools, create communities of practice and research the role of technology and data in social change.</p>
<p>NESTA Challenge Prize Centre Tris Dyson, Emma Renowden</p>	<p>The Centre was established to increase the use and evidence of challenge prizes, so they can be used by governments, charities and businesses to have a tangible positive impact on society.</p>
<p>100% Open Roland Harwood</p>	<p>100% Open helps organisations create new products and services by designing and hosting Open Innovation. 100% Open was an informal spinout from NESTA. This is where a design challenge seeks new ideas and technologies by inviting the public or partners to generate new solutions.</p>
<p>Innovation Unit Cath Dillon, Sarah Dew, Julie Temperley</p>	<p>Innovation Unit is a social enterprise that uses design and innovation approaches to create new solutions to social challenges. Innovation Unit has the mission to develop new solutions that help people and communities to thrive.</p>
<p>NESTA FutureFest</p>	<p>FutureFest is a non-profit initiative from Nesta, the innovation foundation, aimed at bringing future thinking to the public realm. The annual festival hosted 4,000 visitors and brought together speakers, panels and interactive and immersive installations.</p>
<p>The Future Starts Here V&A Museum Exhibition</p>	<p>The V&A is the world's largest museum of decorative arts and design. 100 projects shaping the world of tomorrow: from smart appliances to satellites, artificial intelligence to internet culture, this exhibition brought together more than 100 objects as a landscape of possibilities for the near future.</p>
Copenhagen, Denmark	
<p>Copenhagen Institute of Interaction Design CIID</p>	<p>Copenhagen Institute for Interactive Design is a world-renowned school for research, education, consultancy and business start-up incubation. It focusses on the design of innovative products, services and environments.</p>
<p>Designing for Sustainability CIID</p>	<p>Applying Design Thinking as an approach to problem-solving for sustainability, an ambiguous, systemic challenge. Lead by Ex-Ideo team members Steve Bishop, Andrew Lovett-Barron.</p>

<p>Designing Connected Products CIID</p>	<p>A week-long design sprint in 'Connected Products' - a network of physical devices embedded with electronics, software, sensors, and connectivity to collect and exchange data to integrate the physical world to computers. Run by the Founders of Frolic Studio Andrew Spitz, Ruben Van Der Vleuten.</p>
<p>UN Operations Nick O'Regan</p>	<p>UNOPS helps the UN and its partners provide peace and security, humanitarian and development solutions. Services cover infrastructure, project management, procurement, financial management and human resources.</p>

Scotland, UK

<p>Social Investment Scotland Alasdair Davies</p>	<p>Social Investment Scotland makes investments in charities and social enterprises looking to make a positive impact on people's lives, society or the environment.</p>
<p>The Innovation School The Glasgow School of Art, Don McIntyre</p>	<p>The Innovation School addresses complex challenges through new design practices and bespoke community engagement. It seeks to create and design preferable ways of living: futures that will lead to collective wellbeing and sustainable growth for Scotland.</p>
<p>NESTA Scotland Peter McColl</p>	<p>NESTA Scotland experiments in democratic innovation, participatory processes, the sharing economy. The Scottish Government partners with Nesta to find and support early stage projects that build and/or use collaborative digital platforms for sustainable energy and transport for the most vulnerable consumers.</p>
<p>Wallet.Services Stewart Pavitt</p>	<p>Distributed Ledger Technology (Blockchain) in Public Services & Opportunities for Scotland using SICCAR blockchain platform for cross-organisational collaboration. In partnership with the Scottish Government they conducted international and local research into the application of DLT in digital public services.</p>

New York, USA

<p>Open Society Foundation Elizabeth Eagan</p>	<p>Open Society Foundations is an international grant-making network founded by business leader George Soros. The Foundations financially support civil society groups around the world, with the aim of advancing justice, education, public health and independent media.</p>
<p>UNDP Innovation Facility Malika Bhandarkar</p>	<p>The UNDP Innovation Facility contributes to the UN Development Goals by supporting country-level innovations. Targeted funding and technical support seed new ways to do development and to mainstream new ways of working across the organization. They work in: (1) New methods of finance, (2) designing for behaviour change, (3) public sector innovation and (4) leveraging new data.</p>
<p>Blue Ridge Labs @ Robin Hood Hannah Calhoon</p>	<p>Blue Ridge Labs is a digital lab under the umbrella of a The Robin Hood philanthropic foundation. The Lab provides work space, funding, and resources to help launch and grow technology that address economic inequality in NYC. It supports technologists and communities to work together to explore and build technology solutions and launch sustainable ventures.</p>

<p>The Crime Lab Zubin Jelveh</p>	<p>As part of the University of Chicago Harris School of Public Policy, the Urban Labs work to address challenges across five areas of urban life: crime, education, health, poverty, and energy & environment. They partner with civic and community leaders to identify, test, and help scale the programs and policies with the greatest potential to improve human lives.</p>
<p>Google's Daydream @ NYU WEST Fest 2018</p>	<p>Daydream is a Google's artificial and virtual reality hardware and software. It's an 'off the self' way to create 360 video and experience these films to tell stories that people can really experience.</p>

San Francisco, USA

<p>Benetech Labs Anh Bui</p>	<p>Benetech is a non-profit technology business. It connects the social sector and Silicon Valley to generate new software solutions in areas of disability, human rights and justice. Benetech has a Lab where it works with communities, partners, and funders to explore new areas of need and to build software prototypes.</p>
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Vancouver, Canada

<p>EcoTrust Canada Jean Pogge</p>	<p>EcoTrust Canada is an enterprising non-profit. They develop innovative economic solutions that enable rural and remote communities across Canada to lead in the management of, and benefit from, local resources – from forestry to fisheries to housing and energy. They have a vision of people and nature thriving together.</p>
<p>First National Technology Council Denise Williams</p>	<p>The First Nations Technology Council is an Indigenous-led not-for-profit that provides free digital skills training for Indigenous people in Canada and is working towards equitable access to technology to advance sovereignty in the digital age.</p>
<p>Songhees Innovation Centre & Animikii Indigenous Technology Jeff Ward</p>	<p>Songhees Innovation Centre is a co-working space for Indigenous entrepreneurs, freelancers, creatives, innovators, and problem-solvers based at the Songhees Wellness Centre. Its open to any Nation and fosters collaboration between Indigenous innovators.</p>
<p>Raven Capital Partners Paul Lacerte</p>	<p>Raven Capital Partners is an Indigenous impact investment intermediary. It invests in Indigenous social enterprise. It enables finance for revitalization of the Indigenous economy in Canada from an Indigenous world view.</p>