Digital technology for people: Learning from 'non-Western' and Indigenous cultures

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Abstract: This essay explores alternative ways to manage societal and environmental issues. Several assumptions of the European Enlightenment – such as the perspectives that people are isolated individuals and nature is an object – have led to many of our current problems. Often, digital technology is designed and deployed within these assumptions. It can be useful to explore alternative ways to design and use digital technology by looking at non-Western, Indigenous cultures. Four examples are discussed briefly: Ubuntu philosophy and the example of a language app for African languages; Māori data sovereignty; the building of a Lakota sweat lodge to inform building computer hardware; and the role of LAN Houses and mobile phones in the empowerment of people in a favela in Brazil. The essay closes with suggestions for learning from these examples.

Keywords: AI, indigenous, empowerment, mutual learning

1. Introduction

Our societies and daily lives are shaped to a great extent by digital technology. We used to be happily surprised with the new and shiny, . But not anymore. Weare increasingly and justifiably concerned about the impacts, harms, and risks of social media, algorithms, and Artificial Intelligence (AI) on society, on our daily lives, and on democracy, inequality, and our environment (Bender et al., 2021; Benjamin, 2019; Buolamwini, 2023; Crawford, 2021; Eubanks, 2017; Noble, 2018; O'Neil, 2016). Crucially, we need to understand that technology is not inherently good or bad, nor is it neutral. Rather, people, as well as the corporations and the states in which they collaborate (Runciman, 2023), design and deploy technology to serve their particular interests. Key assumptions of the European Enlightenment, *that people are isolated individuals, that nature is an object to be exploited*, are very present, in our societies and daily lives. We tend to focus on means,

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on technology, but are largely at a loss when it comes to articulating and pursuing ends (MacIntyre, 2007).

Below, several examples are introduced for doing things differently: how to empower citizens to design and deploy digital technology that promotes values like justice, freedom, conviviality, and democracy. The examples originate from so-called 'non- Western' or Indigenous cultures or marginalised communities. This approach is useful for exploring solutions to problems that the European Enlightenment, with its assumptions of individuality, domination, and exploitation, has created (Steen, 2022). Please note that this approach does not imply that non-Western or Indigenous cultures are better than Western cultures, or vice versa. Please also note that this gesture – *to look to other cultures in search of useful things* – carries the risk of (neo)colonialism and harm. My current gesture is meant to be respectful; I intend to learn from diverse cultures. Moreover, I understand that there is diversity of opinions within a culture; "A single 'Indigenous perspective' does not exist" (Lewis, 2020, p. 4).

The goal of this essay is to explore alternative ways to design and deploy digital technologies, thus attempting to more effectively deal with societal and environmental issues. It is meant to help raise awareness and to inform, inspire, and empower people to act more collectively, working as **active citizens,** rather than as individual and passive consumers or subjects at the receiving end of what corporations or states design and deploy.

This exercise has roots in Aristotelean virtue ethics, which is concerned with enabling people to cultivate relevant virtues to live well together. The premise is that people *can* use digital technologies as tools to cultivate specific virtues (Vallor, 2016). Rather than what often happens, the other way around. Currently, corporations, with business models for grabbing and monetising people's attention, offer social media apps that corrode people's virtues like self-control, honesty, or civility by luring them into their platforms and incentivising them to spread fake news and engage in mud-throwing and polarisation (Vallor 2016: pp. 159-187).

The examples below are from different continents: Ubuntu and the example of a language app for African languages; Māori data sovereignty from New Zealand; the building of a Lakota sweat lodge to inform building computer hardware; and the empowering use of digital technology in a

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favela in Brazil.[1] Please note that the discussions below are merely vignettes or illustrations. For a fuller appreciation of people's perspectives and experiences in these vignettes, more extensive research would be required.

2. Ubuntu, a language app, and relational ethics

Several cultures in sub-Saharan Africa adhere to variations of the philosophy of Ubuntu; Ubuntu recognises the humanity of a person through that person's relationships with other people. It is often summarised as follows: *I am because we are*. Ubuntu has been a key tenet in the work of the Truth and Reconciliation Commission in South Africa in the mid-1990s and in Bishop Desmond Tutu's leadership.

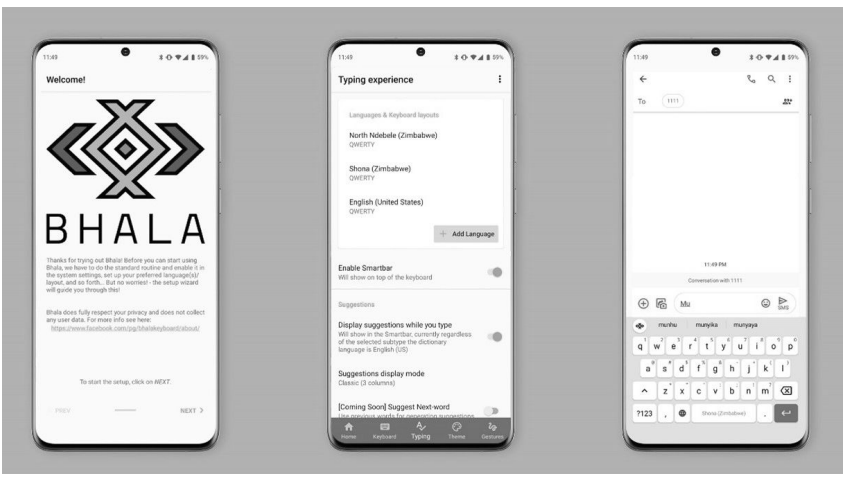

Figure 1: Bhala keyboard app (https://mamgobozidesign.com/bhala-rebranding), designer: Osmond Tshuma (Mam'Gobozi Design Factory), 2021; used with permission

Sábëlo Mhlambi, a Fellow at Harvard's Berkman Klein Center for Internet & Society and a Technology and Human Rights Fellow at the Carr Center

1 This approach, to present examples, was inspired by Jer Thorp's '*Living in data*' (2021); it has many illustrations, to tell stories not only verbally, but also visually. Similarly, I also included illustrations. The Māori example (below) also appears in his book.

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for Human Rights Policy has pioneered the application of Ubuntu philosophy to the design and application of AI systems. He articulated the following critiques: people from marginalised communities are often excluded from the design process; there are biases in the collection of data and in the selection of features; the people involved in design often view technology as neutral and fail to recognise the many and diverse relationships that exist in society; and systems can lead to harmful commodification and centralisation of data and resources. Drawing from Ubuntu, Mhlambi (2020) argues that "[t]echnology should be created with a normative goal to eradicate inequality through the participation of the most disenfranchised", and proposed that systems can be "used for public good and made available to the public in ways that protect privacy and promote the wellbeing of society" and that "[g]reater funding and access to technical skillsets must be made available to the most disenfranchised" (p. 25). Moreover, Mhlambi (2020) founded *Bhala*, an AI startup that aims to democratise the advances of AI to millions of Africans.[2] The company offers a free *keyboard and stickers app* for African languages like Ndebele, Shona, Swati, Swahili, Xhosa, and Zulu, with a spell-checker, auto-complete function, and tools to classify, generate, and correct texts in these languages (see Figure 1). This is meant to remedy the default bias, persistent in digital technology towards English, and thereby promote more linguistically and culturally appropriate communication via digital technology.

More broadly, a similar approach has been developed under the header of *relational ethics* (Birhane, 2021; Birhane & Cummins, 2019; Mhlambi, 2020; Mhlambi & Tiribelli, 2023), as an effort to repair and supplement the default assumption that people are isolated individuals. Relational ethics can be understood to include ethics of care and feminist ethics (Held, 2006). This approach is concerned primarily with, for example, the well-being of people who are affected by a specific system's deployment and the empowerment of the people affected by decisions regarding design and deployment. Their participation in these processes and criticism of systems – notably, the ways in which their deployment can exacerbate injustices or inequalities – is imperative in shifting power balances.

2 https://sabelo.mhlambi.com/ and https://www.itweb.co.za/article/bhala-app-lets-locals-create-online-content-in-their-own-lingo/raYAyqodRDnvJ38N. Please note that this app is still in beta and is only available for Android at the time of this publication.

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3. Māori data sovereignty and self-determination

This story starts with the Treaty of Waitangi (see Figure 2) (Thorp 2021: pp. 219-235). In 1840, representatives of the British Crown and Māori chiefs from New Zealand's North Island signed a treaty with three articles. In Article 1, the Māori people agreed to cede their governance rights to the Crown. Article 2 establishes that the Māori will retain full chieftainship (*rangatiratanga*) over their lands, villages, and all their treasures (*taonga*). In Article 3, the Māori people obtain full rights and protections as British subjects. We will focus here on the word "treasures". This includes not only material objects but also culturally valuable resources and immaterial objects, ideas, and techniques. Over several years, the scope of taonga has been debated.

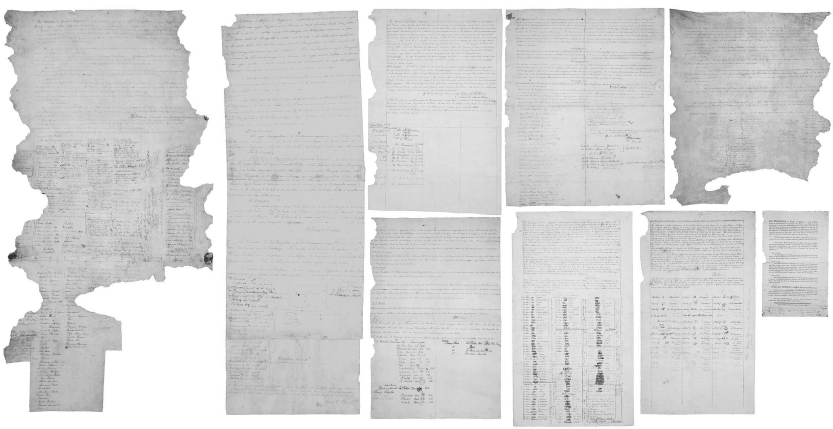

Figure 2: Treaty of Waitangi; https://en.wikipedia.org/wiki/File:Treaty_of_Waitangi_all_documents.jpg

This is not unusual with treaties; before and after their signing, parties debate the precise wordings and their meanings, especially if a treaty is written in different languages, as is the case with the Treaty of Waitangi, which was written in both English and Māori. A key question is: *What belongs to taonga?* The answer determines over which taonga the Māori will retain full chieftainship. In the course of the 1980s and 1990s, a series of rulings determined that radio frequencies, spiritual places, and knowledge about flora and fauna belonged to taonga. Similarly, the Māori Data Sovereignty

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Network (*Te Mana Raraunga*) advocates for Māori rights regarding all sorts of data that pertain to their way of life, their environment, and their culture.[3] This would mean that these data are and remain Māori's taonga even if these data are collected by an organisation in the UK and stored in a cloud service of a corporation in the US).

For data sovereignty, the United Nations' Declaration On The Rights Of Indigenous Peoples of 2007[4] is also relevant. It prioritises and emphasises rights for self-determination, autonomy, and participation and includes rights that pertain to cultural heritage and knowledge (e.g., public health data and data about animals and plants). For former colonies, like New Zealand, this is crucial. Data sovereignty is an effort to try to repair some of the damages of colonisation, similar to giving back ownership over objects that were stolen during colonisation. Moreover, data sovereignty is meant to combat common practices in which states or companies from abroad collect data on Indigenous people and their environment, owning, analysing, and utilising this data for their ownbenefit and causing harm to the people to whom these data pertain. We can learn from this example concerning the technological sovereignty of the EU[5] vis-à-vis the US (where corporations have much power) and China (where the state has much power) to promote freedom, equality, democracy, and participation.

4. Building a Lakota sweat lodge and building computer hardware

First a bit of context. In 2019, a group of diverse, mainly Indigenous, people – from Canada, Australia, New Zealand, and the US – came together "over 20 months, across 20 time zones, during two workshops" (Lewis, 2020, p.4) to explore various approaches to AI. Although their approaches are very different, they share several tenets, such as Locality, i.e. the requirement that AI systems are designed in partnership with Indigenous communities, and Relationality and reciprocity, i.e. the requirement that AI systems help to appreciate how humans and non-humans are interdependent (Lewis,

3 https://www.temanararaunga.maori.nz/
4 https://www.un.org/development/desa/indigenouspeoples/declaration-on-%20the-rights-of-indigenous-peoples.html
5 https://digital-strategy.ec.europa.eu/en/news/digital-sovereignty-european-chips-act-enters-force

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2020, p. 20-21).[6] In the workshops, one subgroup drew parallels between the process of building a Lakota sweat lodge and building computer hardware, proposing that both can be done "in a Good Way ... because AI cannot be made ethically until its physical components are made ethically" (Lewis, 2020, p. 76). For the Lakota, "[t]he sweat lodge is a place where knowledge is generated about the world" (Lewis, 2020, p. 76) just as a computer is a place where knowledge is stored and processed (see Figure 3).

Figure 3: Building a sweat lodge; (https://commons.wikimedia.org/wiki/File:Building_the_Turtle_Shell_(2028489212).jpg)

When building a sweat lodge, it is critical to start with identifying a specific need and involving relevant stakeholders: "individuals and community members, known and unknown, seen and unseen, including: Stone Spirits, Plant Peoples, Animal Peoples" (Lewis, 2020, p. 77). Similarly, building

6 Several more tenets are mentioned in the *Indigenous Protocol* (Lewis 2020, pp. 20-22): 'Responsibility, relevance and accountability; Develop governance guidelines from Indigenous protocols; Recognize the cultural nature of all computational technology; Apply ethical design to the extended stack; Respect and support data sovereignty.'

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a computer device would need to start with identifying a specific need and involving, for example, the communities of the places from which raw materials originate. Furthermore, each object that goes into building a sweat lodge needs to be compensated for in some way, "offering something valuable in exchange" (Lewis, 2020, p. 78). Analogically, regarding computer hardware, the people involved in mining the materials are entitled to fair compensation and safe working conditions. After mining, the earth would need to be repaired to a healthy state. Finally, the people who build a sweat lodge are required to repurpose, return, or transform the materials they have used. For computer hardware, this would entail requirements to repurpose or otherwise take care of the materials after the computer hardware's life cycle.

One can draw parallels with concerns for the materials, labour, and energy that go into building and using AI systems and the costs and risks to people and the environment (Bender et al., 2021; Crawford, 2021). This problem is particularly hard to solve. Very often, especially for organisations with few resources, it is convenient to procure affordable hardware and cheap cloud services from big tech (e.g., an Android phone and Gmail) rather than more 'responsible options' (e.g., a Fairphone and Protonmail). While some people are able to build their own hardware with, for instance, an Arduino or Raspberry Pi, or their own software models (e.g., Hugging Face), this requires advanced expertise and skills. This need motivate public agencies or grassroots organizations to provide training options to develop such technical expertise and skills.

5. LAN Houses and mobile phones in a favela

This example considers how disadvantaged ("oppressed") people in a favela in Brazil can utilise technology for their empowerment (see Figure 4). This is based on extensive ethnographic studies by David Nemer (2022). He grew up close to the favelas, but never physically went there. This is typical; favela residents often stay in the favelas, and non-residents rarely go into the favelas. Nemer builds on the ideas of Paulo Freire and discusses how people can use digital technology to fight for freedom.

The favelas of Brazil are infamous for their gangs, trafficking, and violence. This is, however, not the whole story. The favela residents use technology in creative ways to build community, foster safety, and improve their lives. In the favelas, there are Telecenters and LAN Houses. These

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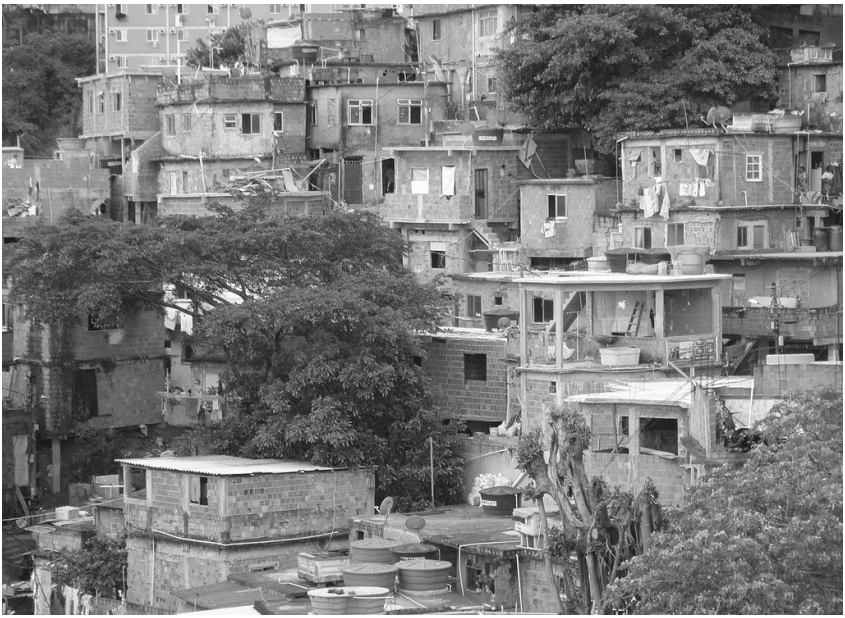

Figure 4: Example of a favela in Rio de Janeiro; (https://commons.wikimedia.org/wiki/File:Favela_cantagalo.JPG)

function not only as places where people can use computers and go online but also as shelters when a gunfight breaks out on the street. They also function as places where children can hang out safely, use Facebook, and play games. They are educational hubs where people can learn computer skills, write their CVs, and apply for jobs online (Nemer, 2020, p. 55-80). Moreover, some Telecenters and LAN Houses enable the favela residents to access the internet on their mobile phones. Typically, the mobile operators' service within the favelas is poor, and subscriptions to internet providers are often too expensive for favela residents. To combat this issue, Cyber LAN House Gustavo "used fifteen Linksys routers placed inside plastic boxes on the light poles and five hundred meters of Ethernet cable to connect his LAN House" (Nemer, 2020, p. 43). With this hack, he was able to provide affordable internet access to the favela residents.

Furthermore, this LAN House now had strong Wi-Fi, which changed how favela residents can use their mobile phones or "*xinglings*". Typically, they would switch off the mobile data (too expensive) and use Wi-Fi instead to go online (Nemer, 2020, p. 47). Now, groups of, for instance, three or

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four friends, could use their mobile phones in ways that promote community. One friend brings a mobile phone. Another brings a charger. Another friend brings a USB cable to connect to the LAN House computer. They can then hang out and socialise, sharing the phone and the computer. This looks distinct from a group of four people looking at their separate mobile phones, as is typical in many other places. This example can inspire novel ways to empower disadvantaged communities, not by inventing products or services for them, but by enabling them to find ways to use digital technology that supports them in their specific circumstances.

5. Discussion and conclusion

Now, what can we learn from these examples? How can they help us to explore ways to enable people to design and use digital technology differently and, more specifically, to find ways to live well together?

As noted already, there is a risk of looking at other cultures to find useful things, to grab these and to use these to do more of the same, and *not* learn anything new (Steen, 2012). This we need to prevent. Instead, to do justice to the people we want to learn from, we can organise communication, collaboration, and mutual learning (Steen, 2022). Meanwhile, to facilitate such communication and collaboration, below are several tentative conclusions, mainly meant as suggestions.

Please note that some findings may seem obvious on a theoretical level. On a practical level, however, it can be very challenging to design and deploy technology in ways that facilitate freedom, equality, and conviviality, especially given the dominant and default emphasis on designing and using technology to increase control over people, make short-term, financial profits based on exploitation, and increase efficiency. The move from individuality to conviviality can be especially challenging indeed.

From Ubuntu and relational ethics, we can learn to include a broad diversity of people – not just those who write and read English – in the design and deployment of technology. Such perspectives can help to draw attention to the deleterious impact of power differences or imbalances. Often, corporations and states have too much power. From the example of Māori data sovereignty and self-determination, we can learn about ownership and control. Using legal documents and legal reasoning, people can obtain ownership and control over data about their own lives. This would be a welcome alternative to the default practices of corporations and states

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that collect and utilise data to further their objectives. The example of building a Lakota sweat lodge draws attention to the materials, labour, and energy that go into the creation and deployment of digital technology – state-of-the-art AI systems in particular. The resources involved typically are outside of most people's awareness. The extraction of materials and the consumption of energy happen overseas: in mines, often in conflict areas, and in unhealthy sweatshops and unfair supply chains. Any initiative aimed at managing materials, labour, and energy with greater care and responsibility is encouraged. Finally, the examples of favela residents using digital technology for their empowerment remind us of the need to make technology flexible, so that people can adopt and modify it to fit their own ways of living and goals. Furthermore, it can remind us to give ordinary people, as prospective users, a say in the design process, so they can contribute meaningfully and transcend their role of mere 'users' ((Schuler & Namioka, 1993, Oudshoorn & Pinch, 2003). Moreover, we need to involve more stakeholders, to speak on behalf of people affected by the technology's deployment, and act to protect and conserve the environments from which materials and energy are sourced.

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References

Bender, E. M., Gebru, T., McMillan-Major, A., & Shmitchell, S. (2021). On the dangers of stochastic parrots: Can language models be too big? In *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency*, 610-623.

Benjamin, R. (2019). *Race after technology: Abolitionist tools for the new Jim code*. Polity.

Birhane, A. (2021). Algorithmic injustice: a relational ethics approach. *Patterns, 2*(2), 100205. https://doi.org/10.1016/j.patter.2021.100205

Birhane, A., & Cummins, F. (2019). *Algorithmic Injustices: Towards a Relational Ethics*. https://arxiv.org/abs/1912.07376

Buolamwini, J. (2023). *Unmasking AI: My mission to protect what is human in a world of machines*. Penguin Random House.

Crawford, K. (2021). *The atlas of AI: Power, politics, and the planetary costs of artificial intelligence*. Yale University Press.

https://doi.org/10.5771/9783748947585-255 - am 23.01.2026, 20:50:34. https://www.inlibra.com/de/agb - Open Access - (cc) BY

Eubanks, V. (2018). *Automating Inequality: How high-tech tools profiles, police, and punish the poor*. St. Martin's Press.

Held, V. (2006). *The Ethics of Care: Personal, Political, and Global*. Oxford University Press.

Lewis, J.E. (2020). *Indigenous protocol and artificial intelligence position paper.* The Initiative for Indigenous Futures and the Canadian Institute for Advanced Research. https://doi.org/10.11573/spectrum.library.concordia.ca.00986506

Mhlambi, S. (2020). From rationality to relationality: Ubuntu as an ethical and human rights framework for Artificial Intelligence governance. *Carr Center Discussion Paper Series, 9*.

Mhlambi, S., & Tiribelli, S. (2023). Decolonizing AI Ethics: Relational Autonomy as a Means to Counter AI Harms. *Topoi, 42*(3), 867-880. https://doi.org/10.1007/s11245-022-09874-2

Nemer, D. (2022). *Technology of the oppressed: Inequity and the digital mundane in favelas of Brazil*. MIT Press.

Noble, S. U. (2018). *Algorithms of oppression: How search engines reinforce racism*. New York University Press.

O'Neil, C. (2016). *Weapons of math destruction: how big data increases inequality and threatens democracy*. Penguin.

Oudshoorn, N., & Pinch, T. (2003). *How users matter: The co-construction of users and technology*. MIT Press.

Runciman, D. (2023). *The handover: How we gave control of our lives to corporations, states and AIs*. Profile Books.

Schuler, D., & Namioka, A. (Eds.). (1993). *Participatory design: Principles and practices*. Lawrence Erlbaum Associates.

Steen, M. (2012). Human-centered design as a fragile encounter. *Design Issues, 28*(1), 72-80.

Steen, M. (2022). Learning From Indigenous Cultures. *IEEE Technology and Society Magazine, 41*(4), 39-43. https://doi.org/10.1109/MTS.2022.3215875

Thorp, J. (2021). *Living in data: A citizen's guide to a better information future*. MCD.

Vallor, S. (2016). *Technology and the virtues: A philosophical guide to a future worth wanting*. Oxford University Press.

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