GLOBAL TRENDS

ANALYSIS

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Tech Power to the People! Democratising Cutting-edge Technologies to Serve Society

INTRODUCTION

Governments all over the world are adopting cutting-edge technologies to experiment with quicker, cheaper and more efficient delivery of services traditionally provided by human beings. From citizen security to allocation of social benefits, technologies are being deployed at a rapid pace, the aim being to serve people better, reduce costs and enhance accountability. The results are mixed. In some cases, the technologies exclude entire groups of the population, thereby exacerbating race, gender or economic inequalities. In other cases, technology is used to surveil specific groups or communities, eroding their right to privacy. And there are no clear remedies to mitigate the harm done by machines or to increase the accountability of those deploying the systems. However, when designing tech interventions, universal human rights, democratic rules and the Sustainable Development Goals (SDGs) should shape the initiatives of the public sector. An important prerequisite is a higher degree of autonomy from big tech companies. Furthermore, participatory design and testing in collaboration with the communities the technologies are intended to serve are needed, not only to avoid harm but to increase effectiveness and quality.

FIGURE 1

DEMOCRATISING TECHNOLOGY:
BUILDING BLOCKS

Public procurement

OBJECTIVES AUTONOMY
ACCOUNTABILITY
HUMAN RIGHTS

Data

Privacy and data
protection

Catalyst for
public-private
social innovation

Algorithms

Transparency

Awareness for
structural inequality

Software

Free software
Local tech teams

Hardware

Auditability
Availability
Repairability

Design justice

collaborative design, testing and evaluation

OBJECTIVES CONSIDER THE COMMUNITIES' NEEDS

INCORPORATE MEASURES TO OVERCOME
DIGITAL BARRIERS

1. DIGITAL TECHNOLOGY: ITS INCLUSIONARY VS. ITS DISCRIMINATORY EFFECTS

As humanity navigates through the COVID-19 crisis, with unprecedented impacts on the poor, governments and charities are stepping in with assistance programmes ranging from cash transfers to food parcels. Large-scale interventions are taking place to guarantee food security, deploy randomised health tests, allocate resources to vulnerable populations and enable education and work to continue for some. Remote health delivery is being fast-tracked in several countries, real-time science fact-checking is already taking place (Hao 2020), compliance with health measures is monitored using artificial intelligence (AI) (Vincent 2020) and 3D printing is being deployed to support medical equipment (Murphy 2020). Online platforms have proved vital for those separated from family and friends. They are a game-changer for the elderly isolated for months at a time, and have even been used to say goodbye to loved ones during their final hours.

More generally, technology has accelerated progress in many areas; with mobile internet and increasingly powerful and lower-cost computing, half the world's population can theoretically connect to anyone else, access and generate knowledge, or engage in commercial or social activity. And for organisations of all sizes, there are now fewer technical barriers to global economic interaction at scale (UN Secretary-General 2019).
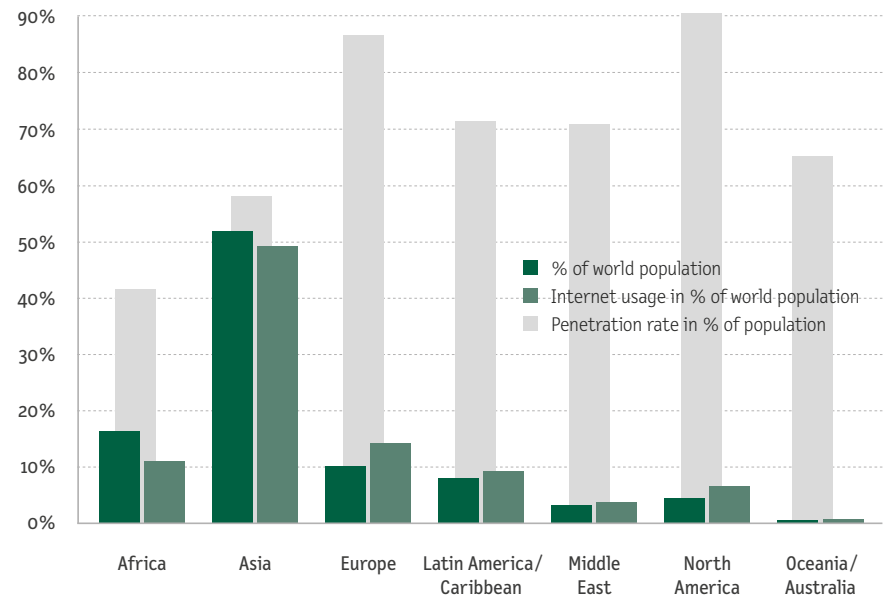
Today's digital technology is a shortcut to economic inclusion, breaking down barriers to information, broadening access, lowering the level of skills needed to participate in the economy and creating opportunities to transform work. As technology is integrated with industries and sectors such as health, education and transport, these opportunities are constantly expanding.

However, divides remain [see Figure 2] and the lack of thought to gender, race and social inclusion in tech-related, state-funded solutions is sparking criticism and encountering widespread resistance in the form of protests, online campaigns (e.g. https://www.banfacialrecognition.com/), strategic litigation (Cox 2020) and legislation at a local level (Lee 2019). For example, from the US to Europe, there are broad alliances advocating for a ban or moratorium on facial recognition technologies.

The stakes are usually high for people when dealing with automated systems which define who is eligible for social programmes, or which monitor and evaluate workers' performance and health (Putzier/Cutter 2020), determine who is hired for a job (Mann/O'Neil 2016), or certify students' abilities and access to study programmes (Simonite 2020). As the scrutiny of the effects of technology in society increases, there is mounting and solid evidence of bias, potentially leading to massive discrimination (Israni 2017; Bogen 2019).

The integration of different key services, in particular, creates scope for censorship and repression by the police or law enforcement authorities (Daskal/Shuang Li 2020). The emergence of super apps, i.e. apps or tech groups concentrated in one system with different basic services, is worrying. For example, when the food and medicines supply and mobility during a pandemic are increasingly mediated by a handful of digital platforms, individuals'

FIGURE 2
World internet usage and penetration rate

Legend:
- ■ % of world population
- ■ Internet usage in % of world population
- □ Penetration rate in % of population

Categories: Africa, Asia, Europe, Latin America/Caribbean, Middle East, North America, Oceania/Australia

Note: Internet usage and world population statistics estimates are for July 20, 2020.

Source: https://internetworldstats.com/stats.htm

dependence and their vulnerability if they are excluded without recourse are frightening, as – in such a case – vital functions depend on opaque systems. Nowadays, suspending an account can be equivalent, in effect, to the suspension of opportunities to exercise rights. And more worrying is the fact that many of the big tech companies providing basic services are also becoming the state's main providers of a digital architecture of surveillance and control.

This paper proposes a comprehensive set of measures, policies and practices that governments could adopt and citizens could rally behind to increase efficiency through technology while respecting human rights and strengthening democracy and citizen participation.

2. SHAPING TECHNOLOGY TO MAKE IT OURS

Novelty, rather than integration and interoperability, is usually what inspires a government to adopt yet another technology or invest in yet another app. The digital transformation of government and aid agencies is supposed to improve the delivery of services and benefits to more people in less time.

Today, almost every governmental activity worldwide is mediated by interactions with technologies and services offered by increasingly concentrated conglomerates. But after the revelations by the US-American whistle-blower and human rights defender Edward Snowden, the trust in systems, hardware and software produced by the United States and its allies has been deeply eroded. A similar situation is emerging with software, hardware and systems made in China. Imagine, for example, if a glitch in a system or sanctions hitting a tech vendor providing services to your city potentially triggers a city-wide shutdown of the entire digital infrastructure on which people depend.

Yet actions to address the problem have been limited. Even the European countries – like the majority of nations – still rely heavily on software, hardware and systems coded outside their borders. But we cannot isolate technology from politics. Increasingly, there is a merger of political power and tech power in the US, which is later extrapolated to the rest of the world. For example, a handful of very large corporations, such as Amazon Web Services and Palantir, a US-based data mining company, have built a 'revolving door' (Mijente et al. 2018, pp. 31ff., 38, 43ff.) to develop and entrench Silicon Valley's role in fuelling the US regime on incarceration and deportation of immigrants, but also to expand their service provision abroad. It is also

important to consider that globally, the US exerts absolute control over the operating systems for most smartphones [see Figure 3].

What can be done about this at the governmental level? When it is the state that acquires the technologies, leverage can be exercised. This is also the case with intergovernmental or intermunicipal cooperation and the opportunities that international technical cooperation and aid offer for horizontal changes. Regardless of the size or technical capacities of the government, some degree of autonomy from big tech companies can be achieved, so individuals and communities can embed principles applicable to their communication tools at least at four levels: the software and hardware adopted to deploy the technology, the algorithms used and the data fuelling all the state systems.

2.1 SOFTWARE

The first consideration should be the software layer. In some regions, it is already a practice for the public sector to only buy free software solutions. 'Free' software means software that respects users' freedom and community. Broadly speaking, it means that the users have the freedom to run, copy, distribute, study, change and improve the software [see Figure 4]. Free software is thus about liberty, not price. It does not mean that the software is available free of charge.

Beyond its replicability, adopting free software as a standard approach not only increases the ability to correct the path once the technology is adopted and solve glitches without spending vast government resources. It also generates a sharing ecosystem across public administrations. They could benefit and learn from the way in which technology is used by local communities, translate the software into local languages without incurring major investment costs and let citizens analyse and be aware of the systems deciding important issues. But technology cannot happen without people supporting it. Instead of spending millions every year on new software licences, the focus should be on developing local capacities inside the public administrations; tech teams with the right problem-solving skills could be set up in national and local administrations.

FIGURE 3

HIGH CONCENTRATION OF POWER
IN GLOBAL TECH MARKET

Google is literally synonymous
with internet search
*Search engine market share
worldwide, September 2020*

Google
92.26%

Yandex
0.5%

Yahoo
1.59%

Bing
2.83%
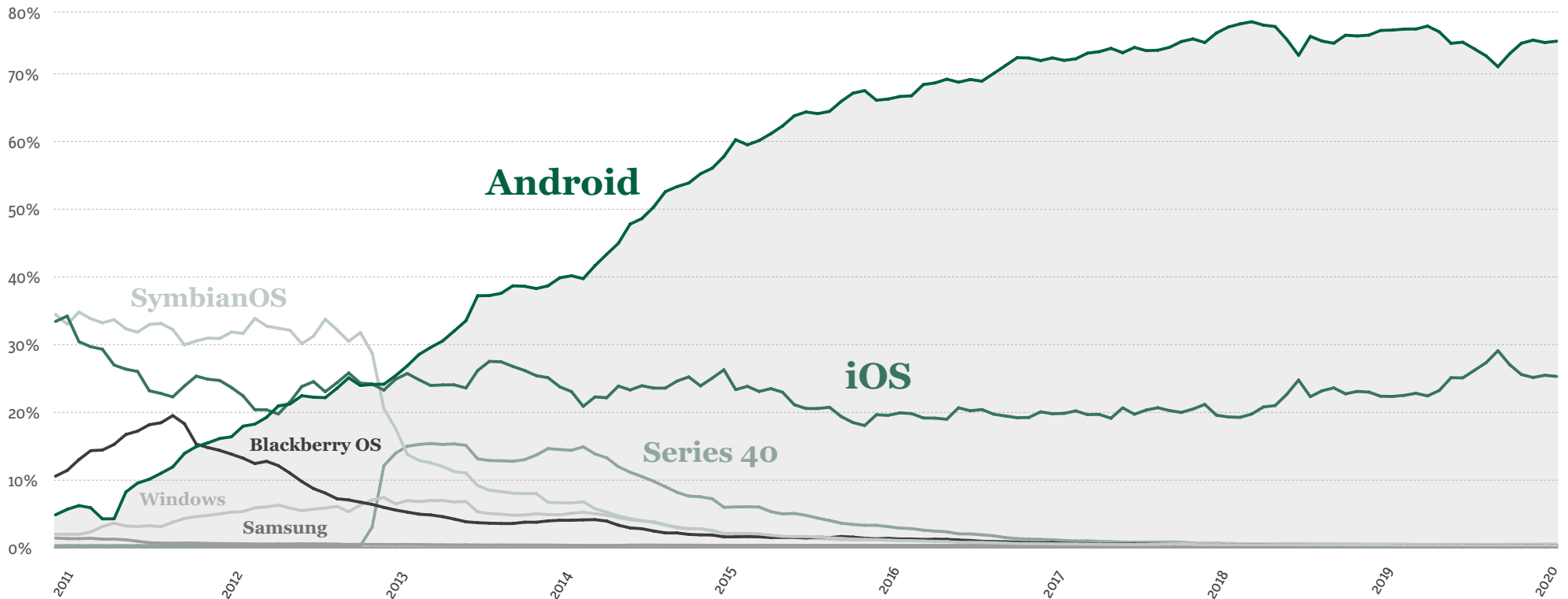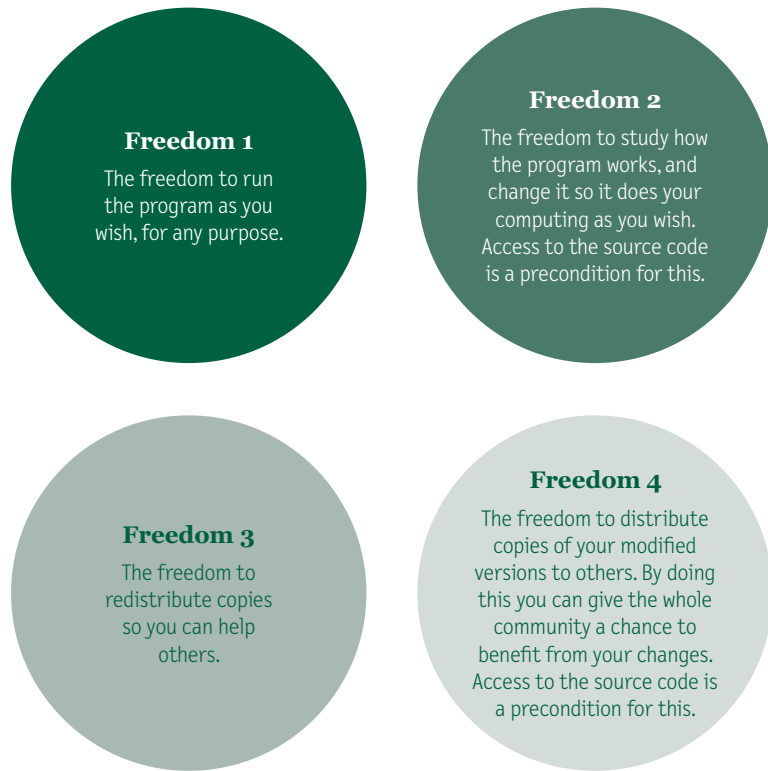
Duck
DuckGo
0.5%

Baidu
1.14%

Three quarter of mobile phones operate under Android
*Mobile operating system market share worldwide from
January 2010 − September 2020*

Source: https://gs.statcounter.com/search-engine-market-share

Android

SymbianOS

iOS

Blackberry OS

Series 40

Windows

Samsung

FIGURE 4
The four freedoms characterising free software

Freedom 1

The freedom to run the program as you wish, for any purpose.

Freedom 2

The freedom to study how the program works, and change it so it does your computing as you wish. Access to the source code is a precondition for this.

Freedom 3

The freedom to redistribute copies so you can help others.

Freedom 4

The freedom to distribute copies of your modified versions to others. By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.

Source: https://www.gnu.org/philosophy/free-sw.en.html

2.2 HARDWARE

The second element to take into consideration is the physical layer, i.e. the hardware and devices a government uses to deploy a tech intervention, which can range from mainframe computers to tablets, mobile phones and cameras distributed among public servants and across a city. Here, citizens and the public administration face three challenges. The first is auditability, because much of this technology is protected by intellectual property law and design configurations that restrict analysis of its functions. More worryingly, many of these provisions restrict the right to repair the devices (see https://repair. eu). The second is availability. As we have seen with the crisis in the supply of personal protective equipment, in a disrupted world, it is no longer possible to rely on rapid and smooth delivery of key goods. The third is programmed

obsolescence and how it costs the citizens when the technology is constantly replaced. Longer-lasting, recyclable, repairable and auditable hardware could bring broader benefits to citizens [see the section 3 on public procurement].
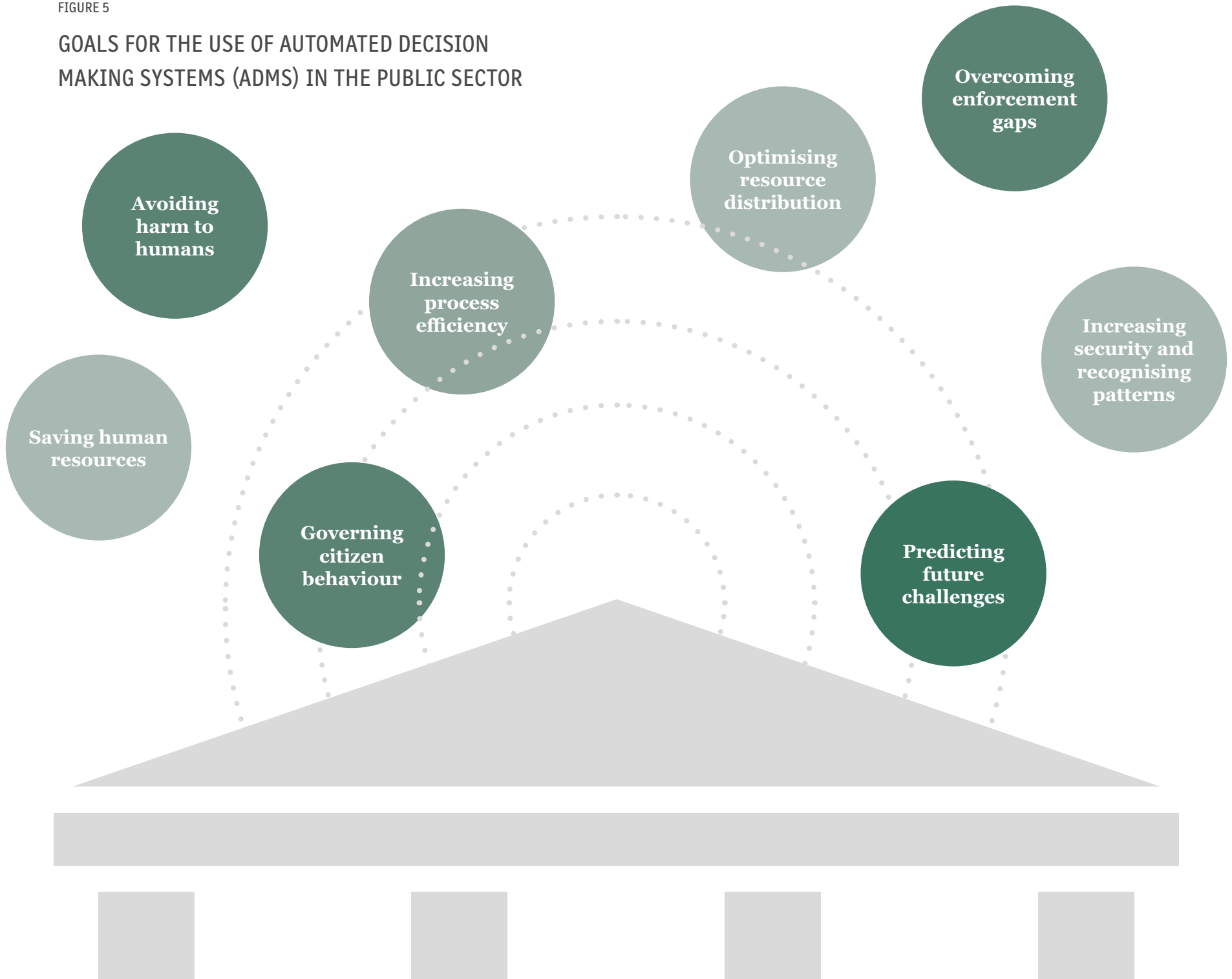
2.3 ALGORITHMS

Entering the more complex terrain of artificial intelligence (AI), automation, data and decision-making by the public administrations, 'algorithm' is one of the magic words. An algorithm is a set of instructions designed to perform a specific task. In the context of the public administration, one such task may be to optimise the use of energy, identify the most vulnerable geographical areas or improve resource allocation. This is where Automated Decision Making Systems (ADMS) come in. ADMS are socio-technological frameworks that encompass a decision-making model, an algorithm that translates this model into a computable code, the data this code uses as an input (either to 'learn' from it or to analyse it by applying the model) and the entire political and economic environment surrounding its use. ADMS fast-track the state's ability to respond to diverse needs. But they also exacerbate unresolved issues, such as gender and racial equality. If accompanied by an understanding of structural inequality mechanisms in both traditional and more recent digital welfare systems, however, integrating ADMS into welfare can be a revolutionary process [see Figure 5]. It even has the potential to challenge outdated assumptions about gender roles, for example, and design a social protection system that truly empowers women and leads to a more equitable society for all (Digital Future Society 2020). Therefore, exploring the potential and scope of such systems to improve our societies is not only imperative but urgent. However, concentration of the industry in the sector and its opacity remain obstacles (Lohr 2019).

This goes to the core of democracy and our understanding of how a government makes decisions and how it is held accountable for the consequences of its actions. When decision-making is delegated to a system provided by third parties, the vendors are not expected to have the same level of accountability and responsibility as a government. Furthermore, international rules protect trade secrets, enabling businesses to shield their algorithms from public scrutiny (this is known as a black box system). Black boxes impede accountability and trust. For the affected citizen, it is hard to understand whether they are experiencing exclusion or discrimination if the machine says no. We can-

FIGURE 5

GOALS FOR THE USE OF AUTOMATED DECISION MAKING SYSTEMS (ADMS) IN THE PUBLIC SECTOR

Overcoming enforcement gaps

Optimising resource distribution

Avoiding harm to humans

Increasing process efficiency

Increasing security and recognising patterns

Saving human resources

Governing citizen behaviour

Predicting future challenges

Source: Digital Future Society 2020, p. 27

not audit what we cannot see, nor can we audit what we cannot understand. Globally, citizens are asking governments to keep the algorithms auditable, to enable due process against the machine. The agreements related to AI should also be transparent, so governments can fine-tune them and adapt them according to their needs over time.

2.4 DATA

The fourth issue is data, especially data collected by third parties while providing services for a state. While citizens' privacy and data protection are a must, and the higher standards available should be applied for publicly-run tech deployments, there is an additional consideration. Data is a valuable state asset that could be used nationally and locally, not only to increase the effectiveness of the public administration across institutions and break thematic silos, as the cybernetics plans of the past dreamed of (Medina 2011, p. 15ff.). It could also be a catalyst for a public-private-social innovation ecosystem, as the city of Barcelona is intending with its city data commons (Ajuntament de Barcelona 2020). A positive vision will, at the same time, restrict the access to public data for further use to the foreign companies providing the service and create a pool of non-sensitive data so universities, the public and the private and social sectors can benefit from it (for further reading, see Morozov 2019).

By combining data commons, auditable algorithms, sustainable, auditable hardware and free software, a government would have covered at least half of the requirements to serve people better with technology.

3. THE ROLE OF PUBLIC PROCUREMENT: WATCHING WHAT GOVERNMENTS BUY

As discussed in the previous section, when imagining a blueprint for the future, governments aiming to regain their control of vital infrastructure and to serve their citizens better should put the public interest first when assessing technology. They should invest in their own infrastructure to transmit data, at least for information relating to governments and strategic sectors. They should prioritise and create incentives for investment in regional data centres and for local developers and local industries providing services and equipment. Furthermore, governments should invest more and better in decentralised platforms and services to provide citizens with a basic participatory infrastructure, and they should pass comprehensive legislation to open all black boxes, prioritising sustainability and adaptability of the systems they deploy.

This could be achieved by changing the procurement rules, specifically those relating to acquisition of technologies. As the COVID-19 crisis has reminded us, for a municipality, local government or state, owning and controlling their critical digital infrastructure (including data as infrastructure) is now crucial to adequately respond to crises, but it is also a catalyst of opportunities.

While the priority for governments and the ask from citizens should be to rapidly develop a local, public interest-oriented technology sector, in the short term, procurement rules can create strong incentives for providers to comply not only with a universal human rights frame and high ethical and open technical standards but also to adapt their services and products to local needs and demand, perhaps adopting them as uniform practices across their industries. The cities of Barcelona and Amsterdam have done this for their Information and Communication Technologies contracts (Barcelona City Council's Office for Technology and Digital Innovation 2017).

If human rights safeguards and accountability are not expressly written into the contracts a company signs with a government, even if it offers its services as a donation, there is room for abuse, especially when collecting personal data. Palantir provided predictive policing systems 'free of charge' to New Orleans for six years (Winston 2018). Over these six years and without

public scrutiny, the programme experimented with crime-forecasting without the citizens' previous knowledge or consent.

Currently, the public procurement process is heavily regulated via trade agreements, global, regional and local trade rules and intellectual property law. All of them provide for exemptions and limitations. These exemptions are not used often enough or well enough to shield society from corporate abuses or to reduce waste of government resources. Furthermore, possibilities of auditing or rewarding companies with better human rights performance are blocked, usually using the amount of the bid as the only criterion for public procurement.

Adequate tech procurement rules can unlock local innovators' potential, incentivise participation by women-led or minority-led companies, create a diverse pool of local providers and increase the value, sustainability and resilience of the state's digital infrastructure as all the specifications, like using green technology, can be included in the calls for proposals.

4. DEMOCRATISING DESIGN: A DYNAMIC CONSULTATION ON TECHNOLOGIES

Good intentions should not be frustrated by poor design choices, biased data and discriminatory technologies, but this is what is happening now. The former Special Rapporteur on extreme poverty and human rights, Professor Philip Alston, published a report (2019) about what he describes as the "Digital Welfare State" (UN General Assembly 2019), where he identifies, after an open consultation with governments around the world, multiple functions now mediated by technology that several countries are using to perform welfare-related tasks. His findings, after surveying dozens of governments around the world, were worrying. His report alerts us to a democratic gap, harming the most vulnerable, in tech deployments.

4.1 PITFALLS IN TECHNICAL DESIGN

Alston concludes that when stakeholders are not involved in the development of the technological intervention, this can lead to abuses by the government, local or central, when deploying the solution. Opaque centralised mass profiling is open to abuse, discrimination, false positives and punitive con-

sequences for those it is meant to serve. Often, he writes, the digital systems, while publicised as voluntary, are de facto compulsory, required to access food or treatment or to exercise freedom of movement. In other cases, they are leading to secondary use of personal data, normalisation of mass surveillance, risk of mandatory tools.

The ancillary costs to the public should be taken into consideration. Not only are Internet access and affordability becoming increasingly difficult for those living in poverty, but access to hardware and digital skills are also barriers leaving those in need behind, not just in the Global South (Tims 2020). Not having an updated mobile phone or a computer could mean more restrictions than merely limited access to information. And sometimes, when reached, automated systems fail to recognise accents, or scanners do not identify features or skin tones. A lack of basic literacy skills could expose people to data theft. And a glitch in the system could mean not receiving basic income support.

Globally, there is an ongoing crisis of trust in technologies offered by governments (Dobrygowski 2020) but the trend is moving towards the deployment of mandatory systems without citizens' consent being sought. The first and minimum requirement for governments should be to provide the affected group with enough information about the technology deployment plans that might affect their communities, especially if the intended beneficiary is still in the process of adopting a technology.

That information should be provided in accessible formats and distributed widely before the call for vendors is issued. Listening to the community's needs will determine, for example, the additional infrastructure the project will require to deploy a technology aimed at serving marginalised communities. Internet access and availability free of charge, basic digital skills, literacy and alternatives for those who cannot overcome the digital barriers would be incorporated in the plan at that moment.
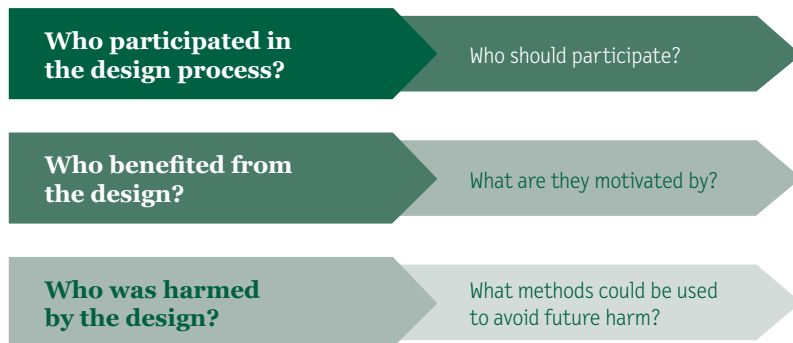
Technological solutions are designed, tested and deployed at the tech companies, with their marketability, profitability and data-gathering potential as the main metrics the tools have to meet. But when such tools are intended to alleviate human suffering or serve a diverse society, rather than simply to boost efficiency and reduce costs, multidisciplinary design, testing and deployment are needed.

4.2 DESIGN JUSTICE

An approach to follow for better co-creation of public technologies is design justice. This means that a technology is designed in connection with the people it is intended to serve and with their participation in the design choices (Design Justice 2020a). Design justice rethinks design, centres around people who are normally excluded from design processes and uses collaborative, creative practices to address the deepest challenges communities face (Design Justice 2020b). Broad, offline consultation processes will also make governments aware of the seriousness of the digital divides in their communities.

An important aspect to consider in relation to design is the need for collaborative evaluation post-deployment [see Figure 6]. There is little evaluation and few long-term studies on the benefits and results of the technologies adopted. In practice, they usually respond to events or are replaced when a new administration comes into power. The decision to deploy a new technology often only takes into consideration short-term results and the cost of the technology itself and leaves no budget for participatory design or an exhaustive evaluation of the costs and benefits of the deployment. When a glitch in a system can translate into a family without food on the table, or a vulnerable person excluded from assistance and arguing against a machine, without any redress mechanism, evaluation is key. Until now, invasive measures such as targeted monitoring of refugees' mobile phones (Jumbert et al. 2018) or tracking every movement of people on parole (Osberg/Mehrotra 2020) and

FIGURE 6
Questions to be answered in the evaluation of the design process

Who participated in the design process?	Who should participate?
Who benefited from the design?	What are they motivated by?
Who was harmed by the design?	What methods could be used to avoid future harm?

Source: Adapted from https://static1.squarespace.com/static/5d5d34e927fded000105ccc4/t/5db4f29c7161a11f1860ea66/1572139687280/DESIGN%2BJUSTICE%2BZINE_ISSUE1.pdf

even checking all the purchases made by those receiving social benefits, were effectively profiling the poor. They reflected a disregard for the need for a design that complied with human rights principles and was guided by social and racial justice. These experiments have rarely been adequately evaluated and audited, especially in terms of effectiveness, other than years later, when, for example, they were challenged before a court (see the Dutch example in van Veen 2019).

The trend in the future should be to conduct an interim evaluation of the technologies being deployed, measure them against criteria that look beyond cost and efficiency and also consider the social impacts in the long term. Evaluating the value of a technological investment from a broader perspective could even lead to the conclusion that technology is not the answer to some of the problems society faces. Or, on the contrary, it may permit scaling of local solutions which are pertinent and effective.

5. CONCLUSION: ANOTHER TECH FUTURE IS POSSIBLE

A future of technology at the service of people, especially those needing it the most, is possible, as described in this paper. What is needed is the right combination of resources, public policies, multi-stakeholder cooperation and laws and rules promoting and incentivising digital social innovation.

Key actions should be taken in the following areas:

- The impact on civil and political rights and on social, economic and cultural rights should be considered before the deployment of a technology by the state and evaluated afterwards. Accountability lines must be drawn, so that the interventions are carefully designed.

- The design and deployment of software and hardware should be enabled by permissive innovation rules, spaces and adequate funding. Flexible patent and copyright exemptions should apply when citizens are exploring solutions of great social impact.

- Procurement processes need to consider more than price, delivery and efficiency. Stricter standards, including human rights standards, are needed when the technology will be used to distribute social benefits widely.

• Access to public information about the technologies being used for digital social interventions is essential to protect citizens from abuse. Black boxes and secret algorithms are not compatible with citizens' rights and authorities' duty to protect horizontal interventions from arbitrariness, discrimination or harmful exclusions.

• Multidisciplinary consultation mechanisms, before deployment of a technology, should not only involve the private sector and technology experts but all stakeholders, in particular those the technology is intended to serve.

• At the same time, governments and the private sector should refrain from rushing to adopt technological solutions without testing and piloting them, especially when the most vulnerable populations depend on the correct, fair, non-discriminatory delivery of services.

• More investment is needed. At an economically challenging time, what we need is a radical redistribution of resources away from repressive technologies and sophisticated defence equipment, useless in peacetime, in order to satisfy needs during complex social and public health emergencies.

Fostering decentralised digital social innovation, while restricting an architecture of oppression, should be the future we start building after the pandemic. The response from citizens – volunteering creative solutions and fighting back for their fundamental rights – has demonstrated that democratising technologies and enshrining rights in law is the way forward.

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