Idea for a journal article prepared just for the Summer School

Democratic deliberation and Technology: Which is the answer, which is the question?

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Abstract

Calls for democratising technology are pervasive in current technological discourse. Indeed, participating publics have been mobilised as a core normative aspiration in Science, and Technology Studies, driven by a critical examination of "expertise". In a sense, democratic deliberation became the knee-jerk response to the question of responsible technological governance, and science and technology communication. Calls for technifying democracy are ever more pervasive in deliberative democracy's discourse. Many new digital tools ("civic technologies") are shaping democratic practice while navigating a complex political economy. Moreover, Natural Language Processing and AI have provided novel alternatives for systematising large-scale participation, automated moderation and setting up participation. In a sense, emerging digital technologies became the knee-jerk response to the question of how to augment collective intelligence and reconnect deliberation to mass politics. In this paper, I explore the mutual shaping of (deliberative) democracy and technology (studies), highlighting that without careful consideration, both risk being reduced to superficial symbols in discourses inclined towards quick solutionism.

Introduction

Is technology the answer to the questions of democratic deliberation? Or is democratic deliberation the answer to the questions of technology? In other words, which is the question, and which is the answer? This article explores how this interplay of questions and answers is unfolding within the academic fields that take the social study of technology and democratic deliberation as their central concern, namely, Deliberative Democracy and Science and Technology Studies (STS).

There are many ways to frame the apparent tension between *technologising democracy* and *democratising technology*. As Levidow (1998) argues, it all depends on how we conceptualise what "technology" and "democracy" is. For many technologists, democratising technology just means making gadgets widely available, and in that sense, technological innovation almost always democratises (Ford, 2021). For others, this tension is best described as an interplay of expertise and institutional decision-making requiring political legitimacy (Bader, 2014).

Others would simply reject that such tension even exists, either reducing science and technology to democracy or vice versa. For example, famed sociologist of science Robert

K. Merton in his 1942 essay "A Note on Science and Technology in a Democratic Order" fundamentally asserted that science and technology operate organisationally as a democracy –although he would later point out a tension between "appropriate" and "legitimate" political action that differentiates democracies from expertise (Merton, 1966). Conversely, Bruno Latour famously claimed that "science is politics by other means" (Latour, 1988), and since then, most technology studies have been based on the idea that innovation is displaced politics (Nahuis & van Lente, 2008). Moreover, in the advent of digital democracy narratives, both technology and democracy are seen as deeply intertwined (Ford, 2021).

For this article, I wish to take a narrower approach and interrogate the relationship between citizen deliberation and technology, with a special focus on how this relationship is enacted within the specialised academic communities of Deliberative Democracy and Science and Technology Studies.

An important caveat to keep in mind is that there are relevant theoretical differences between the uses of concepts such as "technology" or "democracy". For once, STS has developed many different social theories regarding what technology is and its role in society, which will not be explored in this discussion –for a classical overview see Bijker, Hughes and Pinch (1989). Moreover, deliberation in the sense of Deliberative Democracy can be seen as conceptually distinct from public participation as STS scholars use it, yet both relate to the overall idea of "talk-centric" (Chambers, 2003) citizen-led governance.

The spirit of this discussion is not to dilute the rich nuances and conceptual differences between the two fields' use of technology and democracy. Rather, I claim that in spite of those differences, both fields, in a very profound way, mirror each other in a game of "questions and answers". To explore this, I will discuss below how technology is playing an increasingly critical role within deliberative democracy. Later, I will discuss how public participation has been used within STS as a core piece in larger puzzles around expertise and normativity. Finally, I present an integrated description of the parallel between the two sections and the risks this presents to both Deliberative Democracy and STS.

Technology in deliberative democracy

Technology has always been part of political systems (Braun & Whatmore, 2010). In ancient Greece, marked pebbles (psephos) or pottery shards (ostraka) were used as voting tokens to protect secrecy and coordinate citizens. The Kleroterion, a randomisation machine, was used to select citizens to serve in political roles for the *Polis*. Candidate citizens from every tribe could insert their tokens and a secretive mechanism then allocate a random column to the available slots.



Photo of a Kleroterion. Marsyas (2005) CC BY-SA 2.5 via Wikimedia Commons.

The invention of the printing press reshaped the arena of political communication and political debate. Even that breakthrough depended on previous technology of paper and ink manufacturing, and typesetting, among others. Contemporary deliberative mini-publics depend on technology as well. More sophisticated technologies of sortition and voting, slideshow tools, and amplification, just to name a few, but technologies nonetheless.

However, when the notion of technology is mobilised within political discourse it is usually to refer to a specific kind of technology, namely, emerging digital tools. As Vinsel and Russell (2020) assert, the digital has dominated (and restricted) our collective imaginaries of technologies. Democratic theory has not been the exception to this capture (Bernholz et al., 2021).

There are different ways in which digital technologies have shaped democratic practices, and more specifically, the application of deliberative democracy. Digital participation has permeated and hybridised almost all types of democratic innovations (Elstub & Escobar, 2019). Internet technology has allowed for video calls to support distributed citizen engagement, or the development of dedicated websites and apps to aggregate citizen ideas, opinions, and votes.

It is now common to refer to these digital tools as “civic technologies” or civic techs for short. The constitution of the field of civic techs is inexorably linked to the dynamics of commodification of participation software and the prospects of profitable (or social) investment (Russon Gilman & Carneiro Peixoto, 2019; Saldivar et al., 2019; Wadekar et al., 2020). In fact, the very origin of the term “civic technology” can be traced back to a 2013 report by the Knight Foundation on social investing opportunities (Patel et al., 2013).

Civic techs can take many forms, but they are usually thought of as online platforms used by convenors to organise and set up deliberation or crowdsourcing. These digital tools not only afford and restrict certain behaviours but also drive framings and imaginaries of democracy. Particularly, what has emerged from this technological diffusion is a sort "platformisation" of participation (Robinson & Johnson, 2023). Civic techs also distribute power and attention. For instance, their design tends to emphasise user experience within deliberation more than how deliberation is translated politically into institutional action (Mellon et al., 2022).

These tools also construct a political economy as they are mostly paid and usually purchased with public funding via contracts with the administrative state (Robinson & Johnson, 2023). Software may be sold under the Software-as-a-Service (SaaS) scheme, or software itself may be freely distributed but consultancy advice charged. Institutional clients can, nonetheless, resent civic technologies drawing too much from the business innovation model or being too 'business-y' (Boehner & DiSalvo, 2016).

Simultaneously, several civic tech initiatives have sought to resist commodification and embrace a "*commons*" approach through open-sourced designs or Creative Commons licencing. Many authors see civic technology as a critical component of digital activism and not a profitable endeavour (Justice et al., 2018). In fact, many well-known civic techs originate from social movements worldwide (Peixoto & Sifry, 2017; Gilman & Peixoto, 2019).

However, many of these open-source civic technologies just end up stagnating in online repositories (Cibrario & Mejia, 2023). In part, this can be explained by the fact that civic tools are often fragmented instead of being interconnected (Gastil & Richards, 2017). But also, as Science and Technology scholars have extensively shown, scientific and technological adoption depends greatly on actors' rhetorical capacity to convince others (Sismondo, 2010). On the one hand, most non-profit organisations presumably have less marketing and public relations muscle to get their products "out there". On the other hand, open-sourced civic techs typically demand more efforts from Governments to upkeep and update the software on their own (Russon Gilman & Carneiro Peixoto, 2019; Shaw, 2018).

In a way, the excessive production of slightly different open-source alternatives helps sustain the "tragedy of the digital commons" (Greco & Floridi, 2004), in which individual actions just saturate the infosphere. Deliberative democrats, in that sense, should keep in mind that *commons* designs can turn meaningless unless *commonly* used.

Beyond the commodification of digital technology by civic tech companies or non-profits, interesting developments are taking place within social computational analysis for democratic innovations. Specifically, the area of computational analysis often called "Natural Language Processing" (NLP) has been fundamental for the development of digital

tools for citizen engagement, especially in the space of analysis and analytics. According to Romberg & Escher (2023), NLP tools used for analysing citizen engagement can be organised into three main categories.

- *Grouping Data Collection by Topic or pre-defined concepts*

In Topic Modelling, there are two primary methods for categorising citizen contributions by topic. In supervised machine learning, the model predicts predefined topic labels for data points using labelled training data. Conversely, unsupervised machine learning identifies latent topics in the data, forming clusters of thematically similar contributions without requiring training data. Other approaches, for instance, Dictionary-based techniques allow matching words to pre-defined criteria. For instance, the Linguistic Inquiry and Word Count (LIWC) predefines a set of words that relate to specific cognitive and relational processes (Tausczik & Pennebaker, 2010).

- *Identifying and re-constructing citizens' arguments*

Recent developments in the field of Argument Mining show promise in the automated filtering of texts to identify the sentences that have argumentative content (sentences that express a standpoint and justifications of that position). Moreover, there have also been successful attempts to automatically classify those sentences as against or for a specific political statement (Schaefer & Stede, 2021). This would allow us to reconstruct entire deliberation transcripts as arguments for and against controversial statements.

- *Identifying attitudes and emotions towards topics*

Sentiment analysis, also called Opinion Mining, is a collection of computational tools that help detect and categorise attitudes toward a specific topic. Generally, these classifiers label citizen statements on a one-dimensional scale from negative to positive (polarity). However, other studies not covered in Romberg & Escher's (2023) review, typically add intensity as another factor (Tian et al., 2018), that allows for more nuanced emotion labelling.

Building upon these computational techniques, democratic support software often provides at least some basic form of categorisation and/or topic that helps stakeholders have a sense of what was discussed. Beyond that, other more nuanced uses include the assessment of deliberative quality (Falk & Lapesa, 2023; Goddard & Gillespie, 2023), or to identify intensity and sources of political polarisation (Németh, 2023). However, most deliberation-specific applications are quite recent and require more testing before widespread diffusion.

Looked at from a more conceptual standpoint, there are at least two main justification themes that explain the increasing symbolic capital of digital technologies for democratic engagement. As I will expand below, one of these themes focuses on the epistemic benefits of technology, and the other on the normative potential of technology to reunite deliberation and mass politics.

The first line of argumentation lies within the epistemic tradition of deliberative democracy. Briefly put, for epistemic democrats, emerging digital technology works as a proxy for "augmenting our intelligence"(Martí, 2021). The connection between the "collective intelligence" approach to democracy and emerging digital tools is almost ontological, as most of these tools are equally predicated on the power of volume and heterogeneity of information (cf. Noveck, 2018). Moreover, for Collective Intelligence scholars, digital information technology and participatory democracy both serve the purpose of enacting and expanding collective consciousness (Hallin, 2023). Public institutions have drawn from the collective intelligence approach to fund initiatives that promise to enhance collective decision-making, collaboration and connecting voices (Grobbink & Peach, 2020).

The second line of argumentation relates to the normative core of deliberative democracy. For some deliberative democrats, digital technologies promise to close the gap between careful deliberation and mass participation (Landemore, 2022). Especially after the so-called systemic turn in deliberative democracy research (Mansbridge et al., 2012), there is renewed attention to the interplays of democratic innovations and the wider political system. Parallelly, Cristina Lafont's (2020) recent critique of the assumption that the public sphere ought to blindly defer to the conclusions of mini-publics has strengthened the need to better articulate how deliberation can integrate to the whole of democracy, or at least to "scale up" its capacity for discursive regulation (Niemeyer & Jennstal, 2018). Of course, this criticism is not new and can be traced to Simone Chambers (2009) provocative question: "Has deliberative democracy abandoned mass democracy?"

For mini-publics to become closer to mass participation, the normative values of deliberation, for instance, authenticity, inclusivity and consequentiality (Dryzek, 2009), along with the extensive expertise of participation designers and facilitators would have to scale up as well. This goes back to deliberative democracy's rejection of pure aggregation of opinions and to Habermas's (1998) idea of informed public opinion as the preferences people "*would* express after weighting the relevant information and arguments" (p.336).

In that sense, technologies that just aggregate ideas (e.g. crowdsourcing tech) would hardly meet these criteria. But surfing the hype of new AI developments, scholars have explored the potential of LLMs (Large Language Models) to automatise some of the normative requirements of deliberation. For instance, AI has been used to automatise facilitation as a means to address power inequalities within groups (Kim et al., 2021; Mikhaylovskaya, 2024), and translation and real-time interpretation as a means of inclusion (Ovadya, 2023).

The use of AI to "augment" deliberative democracy is not without its critics. As Nardine Alnemr (2020) points out, without proper deliberation, the deployment of these technologies forces citizens to passively accept the role of digital technologies and democracy and the parameters set by their expert designers. Moreover, in the case of

automated moderators, it removes participants' right to engage in mutual justification as algorithms cannot in a meaningful way justify their decision-making.

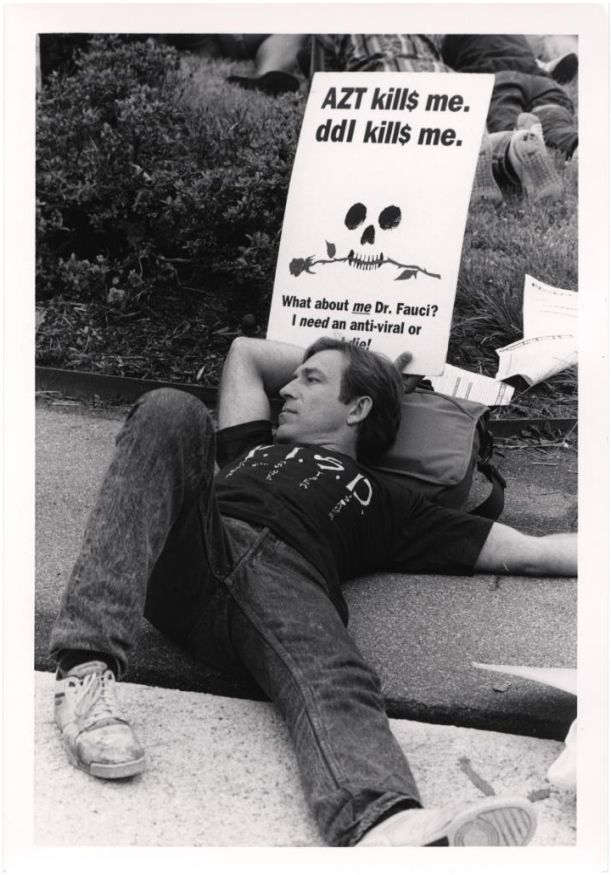
In sum, there is an intricate historically constructed relationship between technology and deliberation to be unpacked. Technology is not a new guest of democracy, but a constitutional pillar since its very foundation. The emergence of technological imaginaries centred around the digital (and its hype) has indeed had an impact on the practices and discourse of deliberative democracy. On the one hand, technological developments in NLP and AI have opened up new possibilities for analysing and scaffolding deliberation. On the other hand, we are witnessing their constitution as "civic techs" as part of a wider confrontation between commodified and commons political economy. In all cases, digital technology is seen as a promising solution to articulate some of the fundamental challenges of deliberative theory. Namely, bringing forth "collective intelligence" to achieve the epistemic objectives of citizen deliberation, and re-aligning deliberation and mass participation by scaling-up some of the discursive features of good deliberative settings.

Citizen participation in Science and Technology Studies

Public participation has been a central theme in Science and Technology Studies (STS) from its inception and it continues to be a major topic in contemporary research (Chilvers & Kearnes, 2020). However, a closer look at its specific uses shows that typically, the notion of participation has been mostly used to support larger debates of mainstream STS literature, rather than as a topic of discussion in itself.

On the one hand, participating publics have served as a paradigmatic point of view in the deconstruction of expertise. Case studies such as Wynne's (1992) sheep farmers in Cumbria provided a more nuanced view on the effects of radiation in the soil than government experts, or Epstein's (1995) account of how AIDS political activists in the 80's reshaped expert medical guidelines have helped to embed the idea that current boundaries between the lay and the expert are problematic. Thus, lay citizens can produce valuable insight and there is an epistemic risk if they are kept out of decision-making.

In a slight counter-move, Collins and Evans (2002)"third wave" Programme, as it has come to be known, questioned the degree to which STS (by then) recent efforts to bring out lay expertise have rendered the role of expertise in society meaningless. In that vein, they asked the question of whether there should be a limit to public participation in technoscientific affairs. This is what they call the "problem of extension".



"'Storm the NIH' ACT UP at NIH" by History at NIH is marked with Public Domain Mark 1.0.
One of the organisations documented by Steven Epstein's (1995) influential work.

According to Collins and Evans (2007) it is true that lay citizens can produce relevant tacit knowledge, and they can even be socialised into the language of scientific expertise (such as the AIDS activists or Collins himself in physics and gravitational waves), however, this "interactional expertise" would still be different to the kind of contributory expertise produced by the specialists. It must be noted that Wynne (2003) argued that his work was not meant to be understood as concerned with the exclusion of "people with authentic but unrecognized expertise" (p.402) to the arena of expert deliberation about propositional truths. Rather, he was making the substantive claim that as lay citizens and experts share different forms of life, their ways of knowing cannot easily, if at all, be reduced into an unified language and practice. Thus, making the legitimacy of science a complicated endeavour. Hence, public participation is not thematised as a thing in itself, but as a piece in the puzzle of the ontology of scientific expertise.

On the other hand, public participation has served as part of the overall STS normative understanding of knowledge making. The sociological observation underlying this perspective is that scientists and engineers are in practice also policy makers, insofar they find themselves in the policy room many times, in advisory roles, as science communicators or managers (Miller & Neff, 2013; Pielke, Jr, 2007). In this sense, there is a

political dimension to scientists and engineers that begs the question of legitimacy, especially when lay citizens are excluded of the decision-making sphere to which experts do indeed get an invitation. However, more broadly the theoretical argument is that the scientific, the governmental and the publics are co-produced (Chilvers & Kearnes, 2020), and thus, participation is a constitutional system of both technoscience and democracy (Chilvers & Kearnes, 2020).

From this co-productionist theoretical standpoint derive also normative expectations for public participation in technoscientific governance and science policy. In fact, citizen views are seen as invaluable for completing the picture of anticipating the socio-political consequences and implications of new science and technology. As Jasanoff (2016) puts it, the practice of anticipation "offers an opportunity for citizens to work together with scientists, engineers, and public officials to envision more inclusive technological futures" (p.238). Others, inspired by participatory literature, such as the famous –and often criticises– Arnstein's (1969) ladder of participation have called for more pervasive public participation, in upstream technological development (Bauer et al., 2021) and the science-making process itself (i.e. citizen science; Strasser et al., 2018). This can clearly be observed in the STS-driven Responsible Research and Innovation (RRI) movement that has called for more upstream public deliberation and participation as one of its four constitutional values (Owen et al., 2013). More recently, this baton of public participation has been taken up by the renewed institutional interest with Open Science/Open Research that focuses on wider collaboration with communities (European Commission, 2021; UNESCO, 2022)

In this sense, participation plays a key role as a normative expectation derived from a co-productionist standpoint of science policy and technology governance. Under this perspective, it simply is not fair that scientists and experts communicate "top-down" (Trench, 2008) to citizens issues that, because of their political and cultural nature, they are entitled to discuss and shape. Moreover, these are issues that without their voice, any risk assessment would be, at the very least, incomplete (Jasanoff, 2016). This is what I would call a deontological argument for participation, which is often present after the "normative turn" in STS (Lynch & Cole, 2005). By deontological, I mean arguments that take the form of institutional *duty* or *obligation* to invite citizens.

Public participation has also played a normative role within discussions of science communication. STS scholars were critical of the 1960 to 1990's prominent scientific literacy movement that reproduced a "deficit model" (Sturgis & Allum, 2004) of the public that framed them as lacking the relevant information to engage meaningfully in the sociotechnical dimensions of society. Against this background, STS scholars called for two-way communication between experts and the public under the motto of "deficit to dialogue" (Irwin, 2014; Stilgoe et al., 2014). In turn, this movement towards participation led to a reframing of science communication from ideas of Public Understanding of Science (PUS), to Public Engagement with Science and Technology (PEST).

Finally, participation has played a role in STS own position on current political developments. More recently, STS scholars have also position themselves and public participation in the ever more present "crisis of expertise" (Gil Eyal, 2019) that tension modern democracies. According to Eyal (2019) the crisis of expertise is double, on the one hand technical experts have lost the public confidence as the main decision-makers (which some colloquially name a post-truth society), and, on the other hand, we live in an increasingly technified and expert society that permeates all spheres of life. Even STS role in bringing about this crisis is still largely debated (Collins et al., 2017; Sismondo, 2017).

In this context of crisis, STS scholars have suggested the importance of more engagement for reconstructing trust (Chilvers & Kearnes, 2020; Stilgoe et al., 2014), while other STS scholars have suggested reinvigorating the role of experts. For instance, Collins et al. (2022) advocate for a model of democracy in which citizens, governments and bodies of experts are only one of the many institutions, mutually regulating, but with differentiated responsibilities and roles in complex societies. Under that model, the boundaries of expertise ought to be defended, as they play a critical part in democratic checks and balances. This is what they call "structured choice democracy", which is presented as an alternative to both populism and technocracy, which are perceived to have produced this crisis.

In sum, it seems that public participation has played an auxiliary role in much larger debates in STS:

- Participation has a secondary role in the debate on the ontology of expertise
- Participation is produced as a normative expectation in science and technology policy and communication
- Participation (and its extension) is affirmed and contested in STS scholars' observation of the contingent state of affairs in contemporary democracies.

It seems that participation has been thematised in STS mostly not as a topic in itself, but as a piece in bigger puzzles relating to expertise, and the interface of science and technology with policy and democratic politics (Eyal & Medvetz, 2023). Moreover, STS scholars often find themselves in the tricky position between promoting extensive participation in science and technology and critically examining its practices (Douglas-Jones, 2022; Soneryd & Sundqvist, 2022). Perhaps because of this, not enough attention has been placed in the pursuit of theorising participation itself, rather than being seen as an auxiliary concept with a conceptual function in explaining expertise, or legitimacy. This relates to what Horst and Davies (2021) call a shift from an instrumentalist view of public communication (what it is for) to a cultural view (what it is).

Emerging STS literature has indeed taken more seriously a substantive analysis of participation and democracy. STS, as a field, holds a privileged position to critically explore how democracy and the technosciences are co-produced (Soneryd & Sundqvist, 2023), and how interfaces and infrastructures operate within 'technodemocracies' (Birkbak & Papazu, 2022). However, for these more nuanced perspectives to flourish, the field must

first decisively move away from an instrumental use of participation as a technology of legitimation (Harrison & Mort, 1998). In other words, there is a need to go beyond using participation as a solution in service of solving the normative questions of science and technology.

Discussion

In this paper, I engaged in a twofold conceptual exploration. On the one hand, I explored how technology is mobilised in the practice and theory of the field of Deliberative Democracy. On the other hand, I discussed the role that citizen participation has played in the field of Science and Technology Studies. The purpose of that twofold exploration is to establish a kind of parallelism between the two fields in order to make a more general point. The parallel between the two fields can be stated this way. Whereas in Deliberative Democracy, citizen participation is turned into a question for which technology is the answer, in STS technology is turned into the question for which citizen participation is the answer.

This apparent paradox speaks loudly of both democracy and technology as sources of a complicated mix of societal anxiety, fear, hopes, and hype. It also speaks of a somewhat weakened state of interdisciplinary dialogue between Deliberative Democracy and STS. There are indeed many lessons these two fields could draw from each other.

For deliberative democrats seeking to invigorate deliberative initiatives through the use of emerging digital tools, STS's accumulated wealth of knowledge regarding how technologies are socially shaped in practice (Williams & Edge, 1996) and their approach to "material democracy" (Marres, 2015) would be incredibly beneficial. For instance, a critical takeaway from user studies within STS is that technology diffusion and implementation change the socio-technical characteristics of design because use leads to processes of technological domestication and user innovation (Stewart & Williams, 2005; Williams, 2019). In that sense, it is not enough to carefully interrogate the design process of civic technologies, but also how these designs change through implementation.

For STS scholars, relationships with deliberative democracy have changed over time. It has been widely discussed how STS understanding of publics was heavily influenced by the first wave of deliberative democrats, including Habermas, Dahl and Cohen (Durant, 2011; Scott, 2023; Thorpe, 2008). However, more recent research has mainly been driven by STS own posthumanist or poststructural tradition. Some STS scholars have criticised that the field has lost contact with its political philosophy (Durant, 2010), or that it now takes as obvious a very thin defence of public participation given that "the technical is political, the political should be democratic and the democratic should be participatory" (Moore, 2010, p. 793). In that vein, STS scholars would greatly benefit from "reconnecting" with democratic theory, especially in Deliberative Democracy's renewed interest in a more nuanced justification of participation (Chambers, 2024) and account of the diversity of deliberation mechanisms (Curato et al., 2021b; Elstub & Escobar, 2019).

More broadly, there is a shared risk for both academic communities around the temptations of solutionism. For STS, but also technoscientific institutions, there is a risk of reducing the problem of legitimacy to a problem of participation *quantum*. In other words, to rely on "participatory" solutionism that takes attention away from a more systemic view of democracy (Curato et al., 2021a), and also underemphasises how exclusion happens within the deliberative fora themselves (Young, 1997). As shown by Frahm et al. (2022), large technoscientific institutions have pushed a "democratic deficit of innovation" that frames countries' complex process of implementing new technologies as if the determining factor is societies' willingness to participate and engage in governance. For deliberative democracy, it relates to the very well-known temptations of "technological solutionism" (Morozov, 2013), that applied to deliberation, will nonetheless likely lead to disappointment (Schuler, 2020). I believe interdisciplinary dialogue between STS and Deliberative Democrats will be fundamental to restrict the power of both participatory and technological forms of solutionism that obscure the more complicated problems and potential solutions to societal challenges. In its absence, we may continue to see paradoxical movements in which for some technology is the problem and participation the quick solution, and for others, participation is the problem and technology the quick solution.

On a final note, it must be recognised that there is a geopolitical dimension to this game. On a global stage, we might ask whose democracy is being solved by whose technology, and whose democracy is solving whose technology. Which countries get to set the rules? Which companies' technology do governments buy? Who does not get to provide answers or get their questions heard?

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