



Shutterstock/Angie8820

Editorial

The Principles of Cyber–Anarcho–Socialism

Jeremy Pitt

Imperial College London, London, SW7 2BT, U.K.

■ **FUNCTIONAL DEMOCRATIC GOVERNANCE** has five fundamental preconditions: civic dignity, confluent values, epistemic diversity, accessible education, and legitimate consent.

Civic dignity, as defined by Ober [1] in the theory of Basic Democracy, is a condition of the body politic that both defines and constrains collective agreements on self-governance. As a value, it is a “coin” with two sides: on one side, civic dignity is created and preserved by the explicit affirmation of citizens (as legally recognized personae) as socially accepted and equal participants worthy of contribution to public deliberation and action. On the other side of the coin, civic dignity is undermined and diminished if the citizens are infantilized or humiliated, e.g., by distraction through spurious or specious confected “wars” on fictitious threats such as drugs (except tobacco and alcohol), “woke,” or just “others”; by policy making about public health during a pandemic focussing on an individual “saving Christmas” rather than the state saving lives; or by gaslighting citizens with conflicting and scarcely credible explanations for blatant rule-breaking during the same pandemic. Moreover, civic dignity is deeply and dangerously diminished if the citizens are tricked into making decisions that, had they been fully appraised of the facts or the proponents’ agendas,

they would not otherwise have made (see, for example, the Athenian expedition to Sicily [2], or the 2016 “Brexit” Referendum in the United Kingdom [3]).

The precondition of confluent values is the requirement that citizens share a set of values that are essentially inseparable: to diminish one is to diminish them all. Ober [1] identifies the key value at the root of Basic Democracy as the avoidance of tyranny: the thought experiment of Demopolis begins with an assumption of a normal distribution of people according to their preference for tyranny-avoidance, and then selects the founders and original inhabitants of the city (Demopolis) from those most strongly opposed to autocratic rule (literally, but also legally, the citizens). However, Ober also argues that the founders should have two other non-negotiable values: prosperity and security. Prosperity is valuable to the city in order to ensure that it remains competitive, attractive and a source of civic pride; and is valuable to citizens to ensure they are free to pursue objectives of self-fulfilment and constitutive human capacities without excessive cost of investment in socially productive purposes (i.e., civic participation). The interdependence of the three values can be observed by one of the most insidious insider threats to basic democracy: the degeneration into minority rule with self-interest rather than the common interest as the primary goal (i.e., the iron law of oligarchy [4]) or into majoritarian tyranny, with the populist’s false

Digital Object Identifier 10.1109/MTS.2022.3148509

Date of current version: 9 March 2022.

equivalence of “more than half” with “democracy” providing a façade for authoritarian rule.

The argument for epistemic diversity as a precondition for democratic governance has many justifications. For some, like Hayek [5], epistemic diversity is foremost a preexisting condition: solutions to economic problems of society, such as the allocation of resources, depend on the application of knowledge and expertise that is not possessed by any one individual in its entirety, nor is it dispersed uniformly, nor is it necessarily noncontradictory. Hayek argues that it is a mistake to try to solve an economic problem by first trying to solve the knowledge distribution problem by creating an all-knowing, centralized authority: indeed, the complexity of information processing by a human collectivity as a “distributed information processing unit” in a dynamic environment is so demanding that any command or planned economy is likely to be both inefficient and ineffective. Moreover, information loss as it passes up a hierarchy is complemented by context gain as central decisions pass down the hierarchy, and may make such decisions removed from and incompatible with local environmental conditions (cf., [6]). In addition to Ober’s argument [7], that epistemic diversity is crucial to the processes of knowledge alignment for a distributed information processing unit to more often than not make the “correct” decision, Foucault identified a power–knowledge relationship and argued that traditional (and violent) forms of exerting power have been superseded by a “subtle, calculated technology of subjection” [8, p.221] which some 50 years later has been enabled and accelerated through subjection by technology [9], [10].

Civic education is linked to epistemic diversity and is a requirement for democratic governance of any collectivity to outlast the lifespan of its individual citizens. Classical Athenian democracy lasted nearly 200 years [7], and the tradition of liberal democracy, with its emphasis on human rights, equity and justice (beyond the values of security, prosperity, and tyranny avoidance of Basic Democracy), has lasted so far about 300 years (and may yet survive its present-day crisis [11]–[13]). Ostrom has pointed out that self-governing institutions for sustainable common-pool resource management have survived over many generations [6], whereby successor generations perpetuate the institutional rules of the predecessors even though they were not party to the original determination of those rules. According to Dewey [14], it is education that facilitates the transition from

uninitiated to initiated that is key to this process. Ober [1] also argues that education should include the value of civic participation and the reasons for an equitable sharing of the burdens of self-governance. However, a key qualifier of education is accessibility: from public schools (in their original conception) to public libraries, from museums to universities, a fundamental property of the educational system should be universal open access to the general public.

Legitimate consent is, in fact, a precondition for any functional form of governance: note that in different personae people often comfortably and largely unquestioningly subject themselves to different forms of governance within different organisational structures and management procedures, not all of which are “democratic.” Universities, in particular, are both hierarchical and elitist (and often elitist when they should be egalitarian, e.g., with respect to access, as discussed above), but can also offer considerable scope for individual and collective choice (i.e., the emphasis on “college” and the self-determination of academic freedom). However, the essential quality here is consent, and the legitimacy of that consent, which depends on it being informed, meaningful and revocable. Being informed, as we have seen, is a function of both civic dignity and civic education. Being meaningful implies that Churchill’s often quoted “least tribute” to democracy as “the little man with the little pencil” voting once every four or five years does have some validity; but it is also a gross misrepresentation and reductive underestimation if that is *all* it means. Democracy means nothing if people don’t participate: but of all the hard-won human rights, to not exercise a right to vote is to deny that historic legacy and (literally) demean democracy. But quality and quantity count as well: meaningful civic participation implies active engagement in pursuit of those confluent values at many levels, creating conceptual resources through social construction [15] rooted in human collectivities [16]. Crucially, though, this consent must be revocable: one aspect of revocation is the right to criticise, dissent and protest when there is a discrepancy between procedures and values [1]; another aspect is that leaving the collectivity should be an option at any point [7]. Furthermore, consent, once revoked, should be nonrepudiable.

Principles of Cyber–Anarcho–Socialism

Having established the five preconditions for functional democratic governance, it is noticeable that, in

the first fifth of the 21st century, each of those preconditions is under considerable threat. The consequence has been the increasing distrust (of politicians) and disengagement (from political processes) in the physical world; but this has been matched by an increasing migration to digital platforms, where the opportunities for citizen assemblies and civic engagement are evident (e.g., [17]). However, many social media platforms have run into problems as a result of testing and optimising for engagement: the most sensationalist material gets the most views and so the learning algorithms recommend increasingly sensationalist material; this is even without targeted advertising, psychological targeting of political messages (sometimes based on privacy-violating data harvesting), and wilful use of misinformation and disinformation.

Alternatively, by abstracting from the design of decentralized solutions for cyber-physical systems [18], we propose a socio-technical design ethos for digital platforms based on a “calculated technology of self-determination,” or self-determination by technology. This design ethos is complementary to the programme for the design of public interest technology [19], and is based on a political philosophy of *cyber-anarcho-socialism*. “Anarchy” and “socialism,” as properly construed, or at least as construed in this context, are not dangerous concepts, but instead are the root of security, prosperity and liberty in cyberspace, whether these are collectivities of software agents, or of people, or a mix of both.

The principles of cyber-anarcho-socialism, and how they could—perhaps should—inform the design, operationalisation and runtime self-organisation of cyber-physical and socio-technical systems are as follows:

1. Anarchy is not “no rules.” The derivation of “anarchy” is from “without ruler,” which is consistent with the avoidance of tyranny, and is not necessarily the same as saying “without rules.” Rather than anarchy being a state of chaos and disorder with no rules, it can be seen as a state of (quasi) stability with no rules that cannot justify themselves. The requirement of rules to justify themselves can be satisfied by reflective self-governance, and is intended to avoid the opposite end of the spectrum involving the immutability of rules and the implacable mindset of the utopia of rules [20]. Anarchy should not be thought of as the absolute destruction of systems of self-governance through socially constructed political institutions.

In addition, its motivation for self-organization and mutuality based on voluntary association and equal participation is far removed from the nihilistic economic ideologies based on “sovereign individuals” masquerading hypocritically as “conservatism.”

2. Buy-in to the Rule of Law. Having just said there is “no ruler” and “no rule immutability,” the second principle is the trick of the mind that maintains the pretence of everyone being governed by an immutable external authority (called “The Law” or “The Constitution”), while at the same time knowing that authority (“Law,” “Constitution”) is socially constructed (i.e., internal), mutable (by mutual agreement of constitutional amendment), and yet without authority, in the sense that it has no actual capacity to enforce compliance, only peers acting on its (nonexistent) behalf can do this. This requires a collective “buy in” to ensure constraints on power, in particular the arbitrary abuse of power, are mutual and nonrepudiable. This is one of the reasons why responsibility and accountability, like other socially constructed relations such as trust, are so important. These relations offer not only self-organizing mechanisms for self and systemic improvement, but also act as essential guardrails for operating within accepted parameters. The corrosion of the social fabric when “inside” individuals repudiate the Rule of Law without repercussion can be more damaging than “outside” threats and attacks.
3. Independence implies interdependence. The quest for personal freedom is age-old, but this includes both “freedom to” (e.g., pursue life, liberty and happiness) as well as “freedom from” (insecurity, poverty, and tyranny). The key observation of Snyder [21] is that to be free (freedom to do) depends on one’s health, and that health (freedom from illness) depends on others. He argues that the relationship between patient and practitioner should be primarily about medicine, with some transactional component, but the forces of privatisation have made it primarily a transaction, with some medical component. More generally, for any individual to be “free” in any domain of meaningful activity (health, education, the pursuit of happiness, etc.) depends on the pro-social behavior of others. Similarly, online presence is not a presence in a vacuum or a property of an avatar: presence implies others, and others imply dependency. Relationships in cyberspace

- should therefore be mutual, reciprocal, voluntary, and cooperative, not metricated, commodified and transactional.
4. Polycentricity and subsidiarity. Polycentricity [22] acknowledges the multiplicity of decision-making authorities, and other stakeholders, and their involvement (e.g., through consultation) in self-governance processes. Subsidiarity is the principle of ensuring that decision making is delegated to the closest point at which it will have an effect. Linked to the third principle, just as individual actions depend on have an impact on others, the collective actions of collectivities have impact on other collectivities: this is a system of systems (i.e., an ecosystem). Structures federated through polycentricity and subsidiarity and are less prone to monopolisation, centralization (through preferential attachment at the application layer) or colonization (with subsequent wealth extraction), because principles of self-determination are stronger and more robust in such structures. Moreover, both polycentricity and subsidiarity contribute to ensuring that a collective expression of values, priorities, and preferences is not a timeless, unquestionable and infallible product of some mechanism of social choice (i.e., a vote), but can be revisited and revised through timely and reflective processes.
 5. Legitimacy. As previously specified, legitimate self-governance is only enacted with the informed, meaningful, and revocable consent of the governed, whatever form of -archy or -cracy is consented to. Legitimate *democratic* self-governance can be implemented by the practice of democracy-by-design [23]. Democracy-by-design is another instantiation of the value-sensitive design methodology (and values-based engineering is now an IEEE standard [24]) taking the same approach as other instantiations such as privacy-by-design [25]. In this methodology, a qualitative human value (e.g., privacy, democracy) is identified as a “supra-functional” design requirement and used as the focus of public interest design, not a bonus grafted onto a functional system as an afterthought. Design decisions should be made manifest in the interface or other signals, for example, by design contractualism or costly signaling. Progressive reform and systemic improvement of the ecosystem should similarly be based on reflection and meta-deliberation about socially constructed relations such as responsibility, accountability, and transparency.
 6. Public property and the common good. In socialist and mutualist thought, private property (as distinct from personal property) is generally only rejected if that property is considered to be essential to the well-being or effective functioning of the collective; see, for example, the typology of common-pool resources defined by [26]. Applying this to the Digital Society, it can be argued that the private ownership of the means of social coordination and collective action can diminish effective functioning. For example, systems for meeting organisation, conference organisation, or charitable donation, etc., could be made available as non-profit-making public services held and operated in trust, without the need for collecting data, digital advertising (which wastes energy) or excessive executive salaries. The U.K. lottery uses the slogan “your numbers make amazing happen,” to which a reasonable rejoinder could be “so do taxes”; it is just that taxes can be more progressive and more honest about their use in wealth redistribution and pro-social benefits in promoting the common good rather than wealth extraction. (Although the fiction that taxes “pay” for public services is a gross misrepresentation of the way macroeconomics actually works and should be thoroughly debunked in every classroom.)
 7. The underlying economic system. The effective functioning of society and self-governance is inextricably linked with the nature of the underlying economic system. As Foucault makes clear [8], historically the economic system underlying liberal democracy was capitalism and the accumulation of capital; subsequently, this process was co-extensive with the accumulation of men. Increasingly, this is now co-extensive with the accumulation of attention. Foucault writes, in 1975, of “anonymous instruments of power, coextensive with the multiplicity that they regiment, such as hierarchical surveillance, continuous registration, perpetual assessment and classification” [8, p.220], thereby anticipating (respectively) surveillance capitalism, social media logins, social media rating and review, and machine learning by some 50 years. The Digital Society needs an alternative underlying economic system different to one based on

surveillance capitalism, rentier capitalism, social media influence, and non-fungible tokens, where Foucault's knowledge–power relation is implicit, anonymized and unacknowledged.

8. Accessible education. As indicated previously, one of the most critical features of civic education is accessibility. There are initiatives to realign the U.S. University system to meet changing cultural, demographic, and socioeconomic factors [27]. Open access is not a notable feature of the U.K. educational system, for all that they call themselves “public” schools, with corresponding predictable consequences of inward-looking self-entitlement and lack of empathy for others [28]. It is therefore essential that access should not be restricted or denied by privatization, delivery should not be metricated [29], the curriculum should not be centrally and politically predetermined [30], and the gatekeepers should not be implicated in iron triangles of mutual convenience [31]. In addition, there should be diverse ownership and regulation of information sources and social media, given the way that social influence works, especially online (i.e., targets seek sources by whom to be influenced, as well as sources seeking targets to influence [32]).
9. Self-governance defined and delimited by the value of human dignity. This is the essential quality of Ober's program of Basic Democracy [1]. This is dignity both in choice and in office. Following [33], the core problem of democracy is that ability and expertise can be subordinate to numbers, and numbers can be manipulated by distortion and trickery, especially if compounded by the denigration of civic education. As previously discussed, civic dignity is undermined if the people are tricked into making choices that are not in the public interest or common good. On the other hand, the problem of alternative forms of governance to democracy, such as aristocracy and meritocracy, is that ability and expertise can be subordinate to wealth, and wealth can be used to secure office solely for the power and prestige, without actually being interested in, knowledgeable of, or responsible for the duties and obligations that come with holding political office. Those so ill-equipped will diminish both the dignity of office, and by extension civic dignity, as their dishonorable deeds encourage imitation by others.

10. The prevention of “othering.” The dominance of social media and the ruthless exploitation of confirmation bias has led to polarization of opinion. Polarization causes “othering,” i.e., the consideration of people with a different opinion, preference or allegiance as not-people, and therefore not worthy of the same rights and treatment as “real people,” to use the populist parlance. In a polarized society with numerically more guns than people, a historical propensity to violence, a tendentious media, lax gun control, and an education system that does not prioritize critical thinking, this tenet might be considered something of a priority.

ONE ALTERNATIVE TO cyber–anarcho–socialism is the status quo. But in this context, we might consider the question “how does a collectivity dispose of a ‘bad’ ruler?” The evaluation of “badness” might give consideration to any ruler lacking in legitimacy because of a broken or gerrymandered voting system; who has no respect for the triadic values of security, prosperity, and liberty for all, or for any other fundamental precondition of democratic governance; who tramples over mutual conventions, institutions, human rights, the public interest, the common good and civic dignity, while wilfully “othering” anyone who does not support him (it is usually a “him”). Lack of accountability leads to increasingly authoritarian and tyrannical behavior; and a continual lack of accountability leads them to act more recklessly and contemptuously until they do something so egregious that the mirror cracks and their true policies, personalities, and intentions are revealed. At this point, were they to get away with such behavior, there would subsequently be no stopping them. We are left with a choice between their incrimination or their revenge, and it is too late for anything else. ■

Acknowledgements

Many thanks to numerous colleagues who commented extensively and encouragingly on this work. This article is much improved as a result, but any residual misjudgements are the author's alone.

References

- [1] J. Ober, *Demopolis: Democracy before Liberalism in Theory and Practice*. Cambridge, U.K.: Cambridge Univ. Press, 2017.

- [2] D. Kagan, *The Peace of Nicias and the Sicilian Expedition*. Ithaca, NY, USA: Cornell Univ. Press, 1981.
- [3] T. Shipman, *All Out War: The Full Story of Brexit*. Glasgow, U.K.: William Collins, 2017.
- [4] R. Michels, *Political Parties: A Sociological Study of the Oligarchical Tendencies of Modern Democracy*. Springfield, OH, USA: Collier Books, 1962.
- [5] F. Hayek, "The use of knowledge in society," *Amer. Econ. Rev.*, vol. 35, no. 4, pp. 519–530, 1945.
- [6] E. Ostrom, *Governing the Commons*. Cambridge, U.K.: Cambridge Univ. Press, 1990.
- [7] J. Ober, *Democracy and Knowledge*. Princeton, NJ, USA: Princeton Univ. Press, 2008.
- [8] M. Foucault, *Discipline and Punish*. New York, NY, USA: Vintage Books, 1995.
- [9] S. Zuboff, "Big other: Surveillance capitalism and the prospects of an information civilization," *J. Inf. Technol.*, vol. 30, no. 1, pp. 75–89, 2015.
- [10] E. Segev, "Volume and control: The transition from information to power," *J. Multicultural Discourses*, vol. 13, no. 3, pp. 240–257, 2019.
- [11] B. Manville and J. Ober, "In search of democracy 4.0: Is democracy as we know it destined to die?" *IEEE Technol. Soc.*, vol. 38, no. 1, pp. 32–42, Mar. 2020.
- [12] D. Runciman, *How Democracy Ends*. London, U.K.: Profile Books, 2018.
- [13] T. Snyder, *On Tyranny*. London, U.K.: The Bodley Head, 2017.
- [14] J. Dewey, *Democracy and Education*. Hollywood, CA, USA: Simon & Brown, 2011.
- [15] R. Putnam, *Bowling Alone: The Collapse and Revival of American Community*. New York, NY, USA: Simon & Schuster, 2000.
- [16] S. Weil, *The Need for Roots: Prelude to a Declaration of Duties Towards Mankind*, A. Wills, Ed. Evanston, IL, USA: Routledge, 2002
- [17] J. Fernández-Martínez et al., "Codesigning participatory tools for a new age: A proposal for combining collective and artificial intelligences," *Int. J. Public Admin. Digit. Age*, vol. 5, no. 4, pp. 50–68, 2018.
- [18] J. Pitt, *Self-Organising Multi-Agent Systems*. Singapore: World Scientific, 2021.
- [19] R. Abbas, J. Pitt, and K. Michael, "Socio-technical design for public interest technology," *IEEE Trans. Technol. Soc.*, vol. 2, no. 2, pp. 55–61, Jun. 2021.
- [20] D. Graeber, *The Utopia of Rules: On Technology, Stupidity, and the Secret Joys of Bureaucracy*. Brooklyn, NY, USA: Melville House, 2015.
- [21] T. Snyder, *Our Malady*. London, U.K.: The Bodley Head, 2020.
- [22] E. Ostrom, "A polycentric approach for coping with climate change," *Ann. Econ. Finance*, vol. 15, no. 1, pp. 97–134, 2014.
- [23] J. Pitt and J. Ober, "Democracy by design: Basic democracy and the self-organisation of collective governance," in *Proc. 12th IEEE SASO*, Sep. 2018, pp. 20–29.
- [24] S. Spiekermann, "What to expect from IEEE 7000: The first standard for building ethical systems," *IEEE Technol. Soc. Mag.*, vol. 40, no. 3, pp. 99–100, Sep. 2021.
- [25] A. Cavoukian, "Privacy by design," *IEEE Technol. Soc. Mag.*, vol. 31, no. 4, pp. 18–19, Winter 2012.
- [26] C. Hess and E. Ostrom, Eds., *Understanding Knowledge as a Commons: From Theory to Practice*. Cambridge, MA, USA: MIT Press, 2006.
- [27] M. Crow and W. Dabars, *The Fifth Wave: The Evolution of American Higher Education*. Baltimore, MD, USA: John Hopkins Univ. Press, 2020.
- [28] R. Beard, *Sad Little Men: Private Schools and the Ruin of England*. London, U.K.: Harvill Secker, 2021.
- [29] J. Muller, *The Tyranny of Metrics*. Princeton, NJ, USA: Princeton Univ. Press, 2018.
- [30] J. Pitt, "The BigTech-academia-parliamentary complex and techno-feudalism," *IEEE Technol. Soc.*, vol. 39, no. 3, pp. 5–8, Sep. 2020.
- [31] J. Pitt, "Governing in bad faith: Suppressing democracy in pretense of 'saving democracy,'" *IEEE Technol. Soc. Mag.*, vol. 40, no. 1, pp. 5–12, Mar. 2021.
- [32] A. Nowak et al., *Target in Control: Social Influence as Distributed Information Processing*. New York, NY, USA: Springer-Verlag, 2019.
- [33] W. Durant, *The Story of Philosophy*. New York, NY, USA: Pocket Books, 2006

Jeremy Pitt is a Professor of Intelligent & Self-Organising Systems with the Department of Electrical & Electronic Engineering, Imperial College London, London, U.K. He is a Fellow of the British Computer Society (BCS) and the Institute for Engineering and Technology (IET), and a member of IEEE. He is the Editor-in-Chief of *IEEE Technology and Society Magazine*.

■ Direct questions and comments about this article to Jeremy Pitt, Department of Electrical and Electronic Engineering, Imperial College London, London SW7 2BT, U.K.; j.pitt@imperial.ac.uk.