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PUBLIC TRUST IN COMPUTING: ANALYZING TRUST AND DIGITAL TECHNOLOGIES WITH THE CONSTITUTIONALISM FRAMEWORK

I. Introduction: Trusting Digital Technologies

The relationship between digital technologies and social questions around trust are strongly debated today. Some members of the public and expert communities see people's trust in one another and their trust in public institutions to be diminished and under threat due to digital technologies.[1] For example, some worry that if people distrust digital tools used for public purposes, this will reverberate to the distrust of institutions that rely upon them. Terms like "infodemic"[2] or "infocalypse"[3] highlight the widespread concern that false or misleading information spread quickly through on-line social networks can dangerously undermine the ability of public institutions to function. There are concerns that the use of Artificial Intelligence (AI) in decision-making in the legal system, digital surveillance tools for security, or digital public health applications for monitoring Covid-19 spread or enforcing vaccine mandates can jeopardize trust in the legal, security, and health mandates of the state. People are similarly concerned that algorithm-accentuated social polarization on-line can bring about radicalization of segments of the population that may contribute to undermining the credibility of democratic elections.[4]

At the same time that digital technologies are seen as a cause of problems of trust, they are offered up as solutions to build and maintain trust among citizens and between them

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[1] Aviv Ovadya, "Opinion | What's Worse than Fake News? The Distortion of Reality Itself," *Washington Post*, accessed September 27, 2022, https://www.washingtonpost.com/news/theworldpost/wp/2018/02/22/digital-reality/.

[2] Tedros Adhanom Ghebreyesus, "Munich Security Conference," February 15, 2020, https://www.who.int/director-general/speeches/detail/munich-security-conference.

[3] Ovadya, "Opinion."

[4] Paul Barrett Sims, Justin Hendrix, and Grant, "How Tech Platforms Fuel U. S. Political Polarization and What Government Can Do about It," *Brookings* (blog), September 27, 2021, https://www.brookings.edu/blog/techtank/2021/09/27/how-tech-platforms-fuel-u-s-political-polarization-and-what-government-can-do-about-it/.

and the state.[5] Open data initiatives and digital identification of citizens around the world are built upon the promise of transparency, public access, and justice. For example, in Cook County of Chicago, Illinois, the Assessor's Office made its residential assessment code and data for computing property values open to the public in order to increase transparency and counteract historic discrimination against homeowners in low-income and predominantly Black neighborhoods.[6] In India, the creators of the Aadhar biometric identity registry, the largest biometric database in the world, describe it as a means to counteract government corruption and achieve a just distribution of services to citizens.[7] In Ukraine, digital technologies have long been presented by entrepreneurs and government officials as an important part of the answer to building public confidence in the government.[8] In all of these cases, digital technologies are large and publicly visible investments of resources and rhetoric as part of projects to (re-)establish public trust in government.

These perspectives on the effects of the digital on social trust are linked to how people perceive the technologies themselves. Scholars and publics debate and seek to measure the "trustworthiness" – the quality of being worthy of confidence – of digital technologies.[9] If people experience a technology to be a "black box" designed by experts and interested politicians that regular civilians are not able to access, scrutinize, or exert control over, this may result in what philosopher Catriona Mackenzie calls "pathologies of trust."[10] Mackenzie describes pathologies of trust as situations in which conditions of extreme vulnerability engender trust or distrust that is unwise or unwarranted.[11] These problematic attitudes to trust and distrust arise from "pathogenic vulnerabilities,"[12] when vulnerability that is a normal part of the human condition becomes exaggerated and systematic due to problematic interpersonal relationships or sociopolitical oppression and injustice.[13]

[5] OECD. *Building Trust to Reinforce Democracy: Main Findings from the 2021 OECD Survey on Drivers of Trust in Public Institutions*. Paris: Organisation for Economic Co-operation and Development, 2022, https://www.oecd-ilibrary.org/governance/building-trust-to-reinforce-democracy_b407f99c-en.

[6] Cook County Assessor, "Why the Cook County Assessor's Office Made Its Residential Assessment Code and Data Public," *Medium* (blog), April 17, 2019, https://medium.com/@AssessorCook/why-the-cook-county-assessors-office-made-its-residential-assessment-code-and-data-public-c964acfa7b0f.

[7] Unique Identification Authority of India, "Vision and Mission".

[8] O. Bodunova and O. Liamzina, "Digitization of Public Authorities as a Measure to Prevent Corruption in Ukraine," *Actual Problems of Improving of Current Legislation of Ukraine*, no. 58 (February 28, 2022): 27–36.

[9] For example, see Afua Adjekum, Alessandro Blasimme, and Effy Vayena, "Elements of Trust in Digital Health Systems: Scoping Review," *Journal of Medical Internet Research* 20, no. 12 (December 13, 2018): e11254, https://doi.org/10.2196/11254.

[10] Catriona Mackenzie, "Vulnerability, Insecurity and the Pathologies of Trust and Distrust," *International Journal of Philosophical Studies* 28, no. 5 (October 19, 2020): 624–43, https://doi.org/10.1080/09672559.2020.1846985.

[11] Ibid.

[12] Catriona MacKenzie, Wendy Rogers, and Susan Dodds, "What Is Vulnerability and Why Does It Matter for Moral Theory?" In Vulnerability: New Essays in Ethics and Feminist Philosophy, ed. Catriona MacKenzie, Wendy Rogers, and Susan Dodds (New York: Oxford University Press, 2014), 1–29.

[13] Ibid, 9.

Pathologies of trust in the context of technology are situations in which technologies appear to introduce a distortion or misalignment between where trust is supposedly due and where it is not given because of structural vulnerability of individuals in the sociotechnical system. The pathology of misplaced trust is an issue that either concerns that people *should* trust and they do not or, on the other hand, place their trust where it *should not* be given. For example, some analysts claim that due in part to technological-accentuated misinformation or lack of proper scientific understanding people may not trust in the democratic election process or in the scientific evidence that climate change is taking place or that Covid-19 vaccines are safe. Or, misplaced trust is an issue that people unquestioningly or naïvely trust technology where they should not. For example, some are worried that people trust too much risk-assessment scores in the legal system[14] or consumers trust blindly and without scrutiny on-line sites that collect user data. In these cases, pathologies of trust and their disruptions of societies are the result of opaque digital systems that (re-)produce structural vulnerabilities. The antidote to such pathology is offered by people who see the digital as a way to ensure transparency and objectivity in an otherwise complex and systemically flawed world of human actors. People who see the digital as an enabler of transparency are more likely to envision this technology as a necessary instrument in the creation of social trust and cohesion.

On the surface, these conclusions about the "trustworthiness" of digital technologies appear to be opposites: either digital technologies are seen as detractors of social trust or as the promised solution. Yet, advocates of both views tend to see digital technologies as determinants of social trust. In this technological deterministic frame, digital technologies appear to be the driving factors of social outcomes.[15] The deterministic view of technology has important consequences for how sociotechnical problems are framed and attempted to be resolved. For example, Pablo Boczkowski has observed that when technological deterministic narratives are used to explain political outcomes, such as that the spread of on-line misinformation results in the rise of the appeal of far-right candidates, this closes off conversations about the historical and social factors that may have contributed to the attractiveness of such candidates and their world-views.[16] Without properly understanding the broader societal forces that contribute, we cannot address the root causes of the problem and may grasp for insufficient or, worse, problematic solutions. In the case of disinformation, this means exaggerated attention to technological solutions like altering information infrastructures that shape social media conversations rather than addressing structural racism or education.

The technologically determinist view of digital technologies also has consequences for how the role and agency of the institution of the law – of core interest to this special issue –

[14] Deven R. Desai and Joshua A. Kroll, "Trust but Verify: A Guide to Algorithms and the Law," *Harvard Journal of Law & Technology (Harvard JOLT)* 31, no. 1 (Fall 2017): 1–6

[15] Leo Marx. Does Tecnology Drive History? The Dilemma of Technological Determinism. (Cambrige, Mass: MIT Press, 1994).

[16] Pablo J. Boczkowski, Presentation at the Science, Technology and the Human Future Conference (Cambridge, MA, 2022).

is perceived. The deterministic framework relegates the law to the role of preserving social trust by regulating digital technologies. This is an instrumental and impoverished view of the law. It perpetuates the problematic idea of the "law lag," which says that technology leads and law responds only after the fact, and it fails to take into consideration the ways in which all technological advancements take place on terrain already steeped in the law and in the social relations engendered by legal norms.[17] Relatedly, this view of the digital and trust presents trust erroneously as an output of expert sociotechnical processes, be they technical or legal, rather than as a constitutive and dynamic element of the social fabric.

To support scholars to study the relationship of digital technologies, social problems of trust, and the law without falling back on the problematic technological determinist logic, I describe in this article the constitutionalism framework from the field of Science, Technology and Society (STS). The framework provides an alternative way of describing and analyzing the relationship among trust, digital technologies, and the law. Importantly, this is an *analytical* framework that, based upon empirical observations about the interactions between law and technology in specific cases, allows scholars to conceptualize this interaction more generally. This understanding can be useful to legal practitioners who seek to affect social outcomes through legal interventions, and, if used to this end, the framework can be a normative tool. The framework, however, is not normative in the sense of advocating for a specific relationship between technology, law, and trust, such as, for example, a human rights-based framework is normative because it centers the protection of human rights in legal practice. In the following section, I introduce the framework and the theoretical foundations upon which it rests. In the subsequent section, I show the analytical insights that scholars can gain by applying this framework to the analysis of digital technologies, the social problems of trust, and the law.

III. Constitutionalism Framework

The constitutionalism framework emerges from the "co-productionist" branch of the field of STS pioneered by STS scholar Sheila Jasanoff. Work in the idiom of co-production has developed methods to make sense of the emergence of new ideas of the human and new forms of life at the interface of technological and social systems. "Increasingly," writes STS scholar Sheila Jasanoff in her definition of the concept of co-production, "the realities of human experience emerge as joint achievements of scientific, technical, and social enterprise."[18] The basic insight of the co-productionist approach is that ideas about what the world is, as a matter of fact, and what the world ought to be, as a matter of social choice, are

[17] Sheila Jasanoff, "Making Order: Law and Science in Action," in *The Handbook of Science and Technology Studies*, ed. Edward J. Hackett, 3rd ed. (Cambridge, Mass: MIT Press, 2008), 761–86; J. Benjamin Hurlbut, "Remembering the Future: Science, Law, and the Legacy of Asilomar," in *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*, ed. Sheila Jasanoff and Sang-Hyun Kim (Chicago; London: The University of Chicago Press, 2015), 126–51.

[18] Sheila Jasanoff, Designs on Nature: Science and Democracy in Europe and the United States. Book, Whole (Princeton, N. J.: Princeton University Press, 2005), 33.

formed together. The idiom of co-production builds upon the fundamental understanding in STS that scientific conceptions of the world and the technological artifacts embodying them are contingent on cultural histories and material circumstances.[19] Going beyond the view that technologies have politics[20] or that technologies are socially constructed,[21] co-production focuses on the dynamic re-formations of the world, and of the human experience in it, as products of interplay of scientific, technological, and social activity.

The coproductionist insight about the dynamic formation of the epistemic, normative, and material worlds invites investigation into how institutions created by people to order society, such as law, are co-produced along with science and technology. STS work on "bioconstitutionalism" examines this relationship by focusing on how life sciences and technologies interact with social and political lives to redefine what it means to be human – a characterization that is foundational to all constitutional orders.[22] Bioconstitutionalism identifies a "constant, mutually constitutive interplay of biological and legal conceptions of life" – a dynamic in which transformations in understandings of what life is activate rethinking of law at the most basic level.[23] Reciprocally, this work shows how scientific and technological developments are made on terrain already steeped in constitutional thinking, although, these are constitutions with a small "c" – comprising not only written rules but a variety of unwritten norms generated by custom, informal behaviors, and institutional practices.[24] The term constitution in the STS context refers simultaneously to the makeup of the human being ("to constitute," the verb) and to the norms according to which people live (the small "c" version of "constitution," the noun). The framework acknowledges the dynamic nature of constitutions in society. STS literature has identified ways in which norms and concepts of constitutional significance, such as the designation of "life," "person," or "citizen" and the responsibilities due to each, are informed by new technologies.[25]

Constitutionalism was first developed in relation to life sciences and biotechnology, through recognition that "revolutions in notions of what biological life is are eliciting correspondingly revolutionary imaginations of how life should be governed."[26] The framework invites scholars to see how law is a site of innovation that adapts definitions and

[19] Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton, N. J.: Princeton University Press, 1985).
[20] Langdon Winner, "Do Artifacts Have Politics?" *Daedalus* 109, no. 1 (1980): 121–36.
[21] Wiebe E. Bijker, Thomas Parke Hughes, and Trevor Pinch, eds., *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology* (Cambridge, Mass: MIT Press, 1989).
[22] Sheila Jasanoff, ed., *Reframing Rights: Bioconstitutionalism in the Genetic Age* (Cambridge, MA: The MIT Press, 2011).
[23] Ibid, 3.
[24] Ibid, 10.
[25] Sheila Jasanoff, "In a Constitutional Moment: Science and Social Order at the Millennium," in *Social Studies of Science and Technology: Looking Back, Ahead*, ed. B. Joerges and Helga Nowotny (Dordrecht: Kluwer, 2003), 155–80; Jasanoff, ed., *Reframing Rights*; J. Benjamin Hurlbut, Sheila Jasanoff, and Krishanu Saha, "Constitutionalism at the Nexus of Life and Law," *Science, Technology, & Human Values* 45, no. 6 (November 1, 2020): 979–1000, https://doi.org/10.1177/0162243920921236.
[26] Hurlbut, Jasanoff, and Saha, "Constitutionalism at the Nexus of Life and Law."

governance with changing meaning of what it means to be alive or have personhood. Constitutionalism also shows that biological definitions of life or possibility to alter living entities do not dictate how to govern life. We see this particularly well when we compare across cultures. For example, issues such as abortion,[27] surrogacy, or high cholesterol[28] are governed differently not just in relation to scientific knowledge, but also because of deep-seated constitutional (legal and normative) ideas of what it means to be a person or citizen, with what rights and duties.

The constitutionalism framework can be used to analyze the interaction between democracy and sciences and technologies beyond the life sciences. Work on bioconstitutionalism provides a more general model for how to understand the linking of ontological and normative orders during times of change and how the presence of formal and informal (explicit and implicit) normative structures inform the ways in which people engage in re-making the world in the context of new and emerging technologies. The general point of constitutionalism in STS – that science and technology construct norms of constitutional relevance tacitly, influencing constitutional orders from the bottom up, while existing constitutional orders create the conditions in which certain kinds of scientific and technological activity is made possible – is generalizable to other sciences and technologies that contribute to redefine life in human societies.

Since 2015, scholars have used the concept of constitutionalism to analyze transformations in human life with information and communication technologies. This scholarship examines how norms of constitutional significance are "embodied in technological standards and practices, hardened into material instruments and artifacts, entrenched within professional discourses, and legitimated through public policy,"[29] and, symmetrically, how constitutional arrangements enable and constrain the emergence of technologies. Applying the constitutionalism framework to the digital, opens up issues like changing political subjecthood as a result of the person's relationship to data or shifts in citizenship. For example, the concept of the "data subject" in the European General Data Protection Regulation (GDPR) is a new legal mechanism for protecting a person's rights to their data in a world where one's data can feel more akin to one's body part (e.g. arm) than an object of possession.[30] Further, the framework invites scholars to explore transformations in the meaning of foundational constitutional concepts like privacy (e.g. in the capacity of aggregated data or cell phone metadata to reveal one's location or identity), justice (in relation to use of predictive analytics in courtrooms), security (with ubiquity of CCTV cameras and computer vision technologies in public spaces), or even "pursuit of happiness,"

[27] Daniela Schuh, "Reproducing Citizenship: Challenges of Cross-Border Surrogacy to the Nation State," Torun, Poland, 2014.

[28] Erik Aarden, "Constitutions of Justice in Genetic Medicine: Distributing Diagnostics for Familial Hypercholesterolemia in Three European Countries," *Critical Policy Studies* 10, no. 2 (April 2, 2016): 216–34, https://doi.org/10.1080/19460171.2015.1024704.

[29] Jasanoff, "In a Constitutional Moment," 166.

[30] Luciano Floridi, ed. *The Onlife Manifesto: Being Human in a Hyperconnected Era* (Cham: Springer Open, 2014).

because access (and knowledge of how to use) computing is deemed essential for human flourishing. Legal status of robots, or more extreme questions of robot's personhood, dignity, and rights also can be helpfully examined in the context of a constitutionalism framework, which provides a blueprint for who is to be considered a person and legal subject. Another area of research in the digital and democracy, approaches to secure constitutional provisions (trust, privacy, security) with technical means (e.g. e-government initiatives, open data activities), can also be considered in the broader framing of constitutionalism in order to see the opportunities for these kinds of technical approaches to align with or challenge existing constitutional orders. In all of these cases, the framework draws scholarly attention to the interplay of law at its most basic level (constitutional), which describes how power relations among people and government should be ordered, with the ways in which digital technologies refashion individual identity and collective life.

II. Rethinking Trust and the Digital with the Constitutionalism Framework

Trust is a key element of social relationships that both technologies and laws are built upon and depend upon to function. This view of trust is different from seeing it as a product of expert sociotechnical processes, whether these are perceived to increase or decrease trust, or as a result of the law's ability to protect trust against abuse such as technological manipulation or corrupt action. Anthropologists have described the ways in which people of different positionalities and cultures trust in different ways and examined the roles that social structure, power relations, and institutions play in trust relationships.[31] This literature shows that trust is not just present or absent, given or withheld, but a signature marker of human relatedness in a given society.[32] Trust is a human relation and it depends upon uncertainty and vulnerability of people in the relation.[33] The extent to which people entrust themselves and their resources to others is a product of the uncertainty and vulnerability that they experience in a given relational situation and in the broader social structures in which they live.

Trust as the Condition of a Technology's Existence

If trust across societies is a product of people's perceived and actual states of uncertainty and vulnerability, then it is possible to see how science and technology, as forms of knowledge, fact-making and expertise, can inform trust relations. STS scholarship comparing different styles of public reason across political cultures suggests that trust varies with the specific ways of knowing, or "civic epistemologies" of a given population.[34] How a public reasons or

[31] Niklas Luhmann, *Trust and Power* (Chichester, Eng: Wiley, 1979); Vigdis Broch-Due and Margit Ystanes, *Trusting and Its Tribulations: Interdisciplinary Engagements with Intimacy, Sociality and Trust* (New York: Berghahn Books, 2016).

[32] Luhmann, *Trust and Power*; Karen S. Cook, ed., *Trust in Society*. Russell Sage Foundation Series on Trust. Vol. 2 (New York: Russell Sage Foundation, 2001); Broch-Due and Ystanes, *Trusting and Its Tribulations.*

[33] Carol Heimer, *Solving the Problem of Trust*. Issue 9804 of ABF working Paper (American Bar Foundation, 1999); MacKenzie, Rogers, and Dodds, "What Is Vulnerability."

[34] Sheila Jasanoff, *Designs on Nature: Science and Democracy in Europe and the United States* (Princeton, N. J.: Princeton University Press, 2005).

comes to an agreement that something constitutes a fact that can serve the project of governance is inseparable from the *ways in which* and *what* people put their trust in.[35] The process by which a community comes to agree that something is legitimate knowledge or how they draw the distinction between what is objective and what is subjective is both conditional on and defining of how and what they trust.

This recognition – that trust is always already there in social relationships and linked to forms of public reason – suggests that ways of knowing and building the world with science and technology emerge from specific cultures of trust. Trust is not a quality separate from technological systems or the output of them, but the very *condition of the technology's existence.* The specific form that a technology takes, such as whether a chat bot based on natural language processing is used to create a virtual assistant for the lonely[36] or for a child with learning disabilities[37] depends upon the forms of trust that people place in private individuals such as friends and family to solve their problems in relation to experts like doctors, therapists, or corporate innovators. Or, the extent to which an algorithmically generated risk-assessment score is integrated into the criminal justice system similarly depends upon the specific cultures of objectivity present in a society, what people see to be the process of just and unbiased decision-making, and the extent to which they place trust in the institutions of the law or the expertise of human judges. As Google AI engineer Blaise Agüera y Arcas observed about AI systems: they are not aliens from outer space, but the products of our human condition,[38] with vulnerability and trust being a constitutive part of that condition. Experiences of vulnerability and uncertainty in human sociality and their institutional manifestations, in concert with specific ways of knowing and reasoning, support certain applications of technological systems to address perceived social problems and contribute to the dissemination of these technologies.

Publics Constituted with Computing over Time

This mutually constitutive interplay between cultures of trust (as part of broader cultures of public reason) and ways of knowing and making the world with science and technology leads to a second insight about the relationship between trust, the digital, and the law. It points to the long-term development and mutual formation of trust with digital technologies. This relationship has evolved through the decades of the development of public computing, which includes publics learning to become "computer literate" and to use computing in their daily lives. The present-day state of trust in digital technologies is a result of a long, gradual,

[35] Theodore Porter, *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life* (Princeton University Press, 1995).

[36] E.g. *Gatebox – Promotion Video "OKAERI"_english*, 2016, https://www.youtube.com/watch?v=nkcKaNqfykg.

[37] E. g. Meet Moxie – The Revolutionary Robot Companion for Social-Emotional Learning, 2020, https://www.youtube.com/watch?v=LQlNtxurleo.

[38] Blaise Agüera y Arcas, Presentation at the AI, Brain, and Society Conference (Paris, France, 2022).

and incomplete process of *publics becoming constituted with computing*. The development of public knowledge of computing has been imagined by government officials, educators, technologists and others to transform and adapt citizens for the information society.

Public trust in social order and in technology was at once a core factor and variable in these projects. Forms of reasoning and being of a populace has since at least the 1960s, when information technologies became increasingly used in many countries for the administration of state services, been articulated and crafted with implicit visions in mind of what computing had to offer, for whom, and why. Nation-states pursuing the development of public computing in their populations were responding to experiences of uncertainty and vulnerability that they perceived to be novel in the post-World War II increasingly global world where the circulation of information was taking on new significance. The coming of the information society was seen as both a condition that would create new vulnerabilities in people's relationships among themselves and in their relation to the state. For example, in the United States, futurist Alvin Toffler described the information society as a state in which many of the norms and habits that people took to be natural no longer applied, leaving people disoriented and stressed.[39] In France, government ministers and philosophers alike worried about new modes of alienation and cultural dislocation that the widespread uses of computing would cause.[40] Even as computing was blamed for being a central factor in these concerns, teaching publics computer literacy and computer culture was pursued as a strategy to respond to these vulnerabilities. Public trust in computing, therefore, is inseparable from the development of public computing itself, that is, the ways of knowing and being that the ubiquitous use of computing habituated and the ways in which publics became known *as* publics due to states' application of information technologies to everyday life.

The constitutionalism framework draws the attention of analysts of the digital and society upon the *longue durée* processes of formation of subjects and citizens with information technologies to uncover the specific forms of reliance upon, expectations of, and visions for computing in public life that are at work today. It brings the making of political identity and subjectivity to the forefront of analysis, revealing peoplehood, with its implicit structures of vulnerability and uncertainty, to be the product of social and technical action.[41] It reminds us that it is essential to see not just how information informs, but how it actively *forms* the trusting subject.

[39] Alv in Tof f ler, Future Shock (New York : Random House, 1970).

[40] Simon Nora and Alain Minc, *L'informatisation de La Société*. Book, Whole (Paris: Documentation française, 1978); Jean-François Lyotard, *La condition postmoderne: rapport sur le savoir*. [Nouv. éd.]. Collection Critique (Paris: Les Editions de Minuit, 1979).

[41] Craig Calhoun, "Constitutional Patriotism and the Public Sphere: Interests, Identity, and Solidarity in the Integration of Europe," *International Journal of Politics, Culture, and Society* 18, no. 3 (June 1, 2005): 257–80, https://doi.org/10.1007/s10767-006-9002-0; Kaushik Sunder Rajan, "Two Tales of Genomics: Capital, Epistemology, and Global Constitutions of the Biomedical Subject," in *Reframing Rights: Bioconstitutionalism in the Genetic Age*, ed. Sheila Jasanoff (Cambridge, MA: The MIT Press, 2011), 193–216.

Moments of Rupture

While the constitutionalism framework draws attention to the decades-long evolution of the relationship between public computing and public trust in computing, it also helps to make sense of specific moments of rupture and transformation in this relationship. Trust today is a result and the context for "constitutional moments,"[42] that is, *moments of rupture in constitutional orders* that are the product of the interplay between legal, technical, and social factors. Such moments of rupture are times of profound disjuncture between the understanding and expectations of people about how they should be governed and the ways in which they are governed. This disjuncture can arise from unauthorized usurping of power, such as when a government does something perceived to be against the will of the people as stipulated in law or expected in norm, or through gradual shifts in expectations and evolutions of rights, responsibilities, and duties that can suddenly culminate as issues that need to be addressed urgently. Technologies do not cause constitutional moments, but they may contribute to bringing a constitutional moment to light by interacting with or challenging established ways of knowing and being. Constitutional moments are by definition unsettling, marked by uncertainty and vulnerability at a collective level that thrusts questions about trust into public and intellectual consciousness. For example, analyzing decades of scholarly attention to trust, Margaret Levi finds that interest in trust increased significantly in the 1990s when the fall of the Soviet Union upended the established international order.[43]

In an effort to respond to a moment of rupture, digital technologies are frequently envisioned and proposed to bring the constitutional order "back" into alignment by creating infrastructures that aim to reduce uncertainty or vulnerability for some. Digital technologies are proposed as solutions to social problems in the context of a broader culture of technological solutionism[44] and the legacy of high-modernist forms of governance planned and executed from above.[45] Thus, constitutional moments involve not only legal solutions to amend laws or even write a new constitution, but also technological solutions. Ukraine's effort to build a new "digital state" in the wake of Russian aggression[46] is an example of how

[42] Jasanoff, "In a Constitutional Moment."

[43] Margaret Levi, "A State of Trust," in *Trust and Governance*, ed. Valerie Braithwaite and Margaret Levi (New York: Sage, 1998), 77–101, https://www.jstor.org/stable/10.7758/9781610440783.

[44] Evgeny Morozov, *To Save Everything, Click Here: The Folly of Technological Solutionism* (New York: Public Affairs, 2013).

[45] James C. Scott, *Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed*. Yale Agrarian Studies (New Haven: Yale University Press, 1998), https://doi.org/10.12987/9780300128789.

[46] Adam Satariano, "Shaming Apple and Texting Musk, a Ukraine Minister Uses Novel War Tactics," *The New York Times*, March 12, 2022, https://www.nytimes.com/2022/03/12/technology/ukraine-minister-war-digital.html; Craig Turp-Balazs, "Ukraine Takes Centre Stage at Davos, Sets out Vision of Digital Future," *Emerging Europe*, May 26, 2022, https://emerging-europe.com/news/ukraine-takes-centre-stage-at-davos-sets-out-vision-of-digital-future%ef%bf%bc%ef%bf%bc/; Delegation of Ukraine, "EU Supports the Organisation of the First International Diia Summit Brave Ukraine | EEAS Website," May 24, 2022, https://www.eeas.europa.eu/delegations/ukraine/eu-supports-organisation-first-international-diia-summit-brave-ukraine_en?s=232; Giannis Marvis, "A

governments bring digital technology through public imaginaries into a moment of political crisis in order to secure stability, cohesion, and a future that both citizens and people around the world can trust in and aspire to. For scholars of technology, society, and the law, such misalignments are opportunities to glimpse why certain regimes of uncertainty and vulnerability are deemed problematic and to see how actors mobilize the necessary public attention to reset them using legal, social and technical means.

IV. Conclusion

The ability and willingness of individuals and collectives to entrust themselves and their livelihoods in another or in an institution is an essential component of viable societies. Due to the significance of public trust, it is no surprise that members of the public and social analysts frequently worry about the harms or extoll the benefits of digital technologies on public trust. But whether they believe digital technologies erode or build trust, they tend to see digital technologies too deterministically: attributing to the technologies power to break or fix social bonds. With this view of digital as driving social change, they relegate the law to a role of either preventing the technological harms by establishing regulations or getting out of the way of technological innovations. According to STS scholarship, this is an impoverished view of both digital technologies, the law, and their relationship to society and social transformation.

Instead of a deterministic view of digital technologies and public trust, I have shown how the STS framework of constitutionalism provides scholars of the digital, law, and society a way to see what is at stake in their relationship and identify opportunities for scholarly and political intervention. Applying the constitutionalism framework reveals that specific cultures of trust are always already at work and embedded in a constitutional order. Cultures of trust, with their key ingredients of vulnerability and uncertainty, are at the foundation of human social orders and institutions built to protect them. These cultures of trust provide the context in which certain kinds of problems of public trust become visible as problems, are agreed upon, and for which technologies can become mobilized as part of the solution. The habituation of the public to specific ways of knowing that digital technologies enable and sometimes actively encourage through their design informs the evolution of public trust over time. Thus, we can see the present culture of trust in computing in a given community to be the result of decades-old projects of constituting the citizen and public with information technologies. Through a confluence of political, social, and technological factors, gradual evolution in constitutional orders and their makeup of trust can suddenly appear to break down. These "constitutional moments" offer valuable insights to scholars of law, technology and society to see empirically how members of society identify the problem to be addressed and go about solving it by involving different forms of legal, technical, and lay expertise and tools. Such constitutional moments offer perspectives from the society about what it (or

Digital Marshall Plan for Ukraine," SWI swissinfo.ch, July 5, 2022, https://www.swissinfo.ch/eng/business/a-digital-marshall-plan-for-ukraine/47728496.

certain members in it) perceives to be the "right" or acceptable distribution of uncertainties and vulnerabilities among individuals, institutions, and governments.

In addition to pointing scholars of law, technology and society to where and how to study the contemporary relationship of digital and trust, the constitutionalism framework also offers scholars and activists a political-normative agenda. Instead of trying to evaluate a technology's trustworthiness and then aligning public trust with it, the constitutionalism framework supports those concerned about trust in today's digital societies to begin by identifying the cultures of trust at work in the society and how and by whom these are mobilized to secure constitutional order.

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Маргарита Бйоніг-Ліпцин. Громадська довіра до обчислювальної техніки: аналіз довіри та цифрових технологій у рамках конституціоналізму

Анотація. Ця стаття розглядає питання довіри в сучасних суспільствах, де дані та обчислення є визначальною умовою суспільного життя, в рамках конституціоналізму в галузі науки, технологій і суспільства. Рамка конституціоналізму, яка розширює та узагальнює оригінальне формулювання Шейли Джасанофф щодо "біоконституціоналізму," стверджує, що зміни у розумінні того, що означає бути людиною в епоху повсюдної комп'ютеризації, вимагають

переосмислення права на конституційному рівні – на рівні базових відносин між державами та громадянами. Ці перетворення людини, однак, відбуваються на території, яка вже просякнута нормами конституції з маленької "к," тобто писаними правилами, а також неписаними нормами, породженими інституційними практиками, які складають щоденний гул суспільства. Рамка звертає увагу на три аспекти довіри в сучасних соціотехнічних умовах: 1) довіра – це не лише вузько людська чи соціальна якість, відокремлена від технологічних систем, але й сама *умова існування технології* та специфічна форма, якої ця технологія набуває; 2) сучасний стан довіри є результатом тривалого, поступового та незавершеного процесу *формування громадськості завдяки обчисленню*; 3) довіра сьогодні є результатом і контекстом "конституційних моментів," *моментів розриву конституційних порядків*, які є результатом взаємодії правових, технічних і антропологічних факторів. Ці аспекти вказують на напрямки втручання, які люди можуть активувати, щоб сформувати поточний стан довіри, і пропонують дослідницькі програми, які вчені в галузі права, суспільства та технологій можуть реалізовувати, щоб зрозуміти цю важливу сферу соціотехнічних відносин сьогодні.

Ключові слова: цифрові технології; конституціоналізм; довіра; вразливість; публічна інформатика.

Маргарита Бйониг-Липцин. Общественное доверие вычислительной технике: анализ доверия и цифровых технологий в рамках конституционализма

Аннотация. Эта статья рассматривает вопрос доверия в современных обществах, где данные и вычисления являются определяющим условием общественной жизни в рамках конституционализма в области науки, технологий и общества. Рамка конституционализма, расширяющая и обобщающая оригинальную формулировку Шейли Джасанофф по поводу "биоконституционализма," утверждает, что изменения в понимании того, что значит быть человеком в эпоху повсеместной компьютеризации, требуют переосмысления права на конституционном уровне – на уровне базовых отношений между государствами и гражданами. Эти преобразования человека, однако, происходят на территории, которая уже пропитана нормами конституции с маленькой "к," то есть писаными правилами, а также неписаными нормами, порожденными институциональными практиками, составляющими ежедневный гул общества. Рамка обращает внимание на три аспекта доверия в современных социотехнических условиях: 1) доверие – это не только узко человеческое или социальное качество, отделенное от технологических систем, но также само *условие существования технологии* и специфическая форма, которую эта технология приобретает; 2) современное состояние доверия есть результат длительного, постепенного и незавершенного процесса *формирования общественности благодаря вычислению*; 3) доверие сегодня – результат и контекст "конституционных моментов," *моментов разрыва конституционных порядков*, которые являются результатом взаимодействия правовых, технических и антропологических факторов. Эти аспекты указывают на направления вмешательства, которые люди могут активировать, чтобы сформировать текущее состояние доверия, и предлагают исследовательские программы, которые ученые в области права, общества и технологий могут реализовать, чтобы понять эту важную сферу социотехнических отношений сегодня.

Ключевые слова: цифровые технологии; конституционализм; доверие; уязвимость; общественная информатика.

Margarita Boenig-Liptsin. Public Trust in Computing: Analyzing Trust and Digital Technologies with the Constitutionalism Framework

Abstract. This paper engages the issue of trust in contemporary societies, where data and computing are a defining condition of public life, with the framework of constitutionalism from the field of Science, Technology and Society. The framework of constitutionalism, extending and generalizing from Sheila Jasanoff's original formulation of "bioconstitutionalism," says that transformations to understandings of what it means to be human in the age of ubiquitous computing require rethinking of law at the constitutional level – at the level of the most basic relations between states and citizens. These refashionings of the human, however, take place on terrain already steeped in the norms of constitution with a small "c," that is, the written rules as well as unwritten norms generated by institutional practices that make up the daily hum of a society. The framework draws attention to three aspects of trust in the contemporary sociotechnical condition: 1) trust is not only a narrowly human or social quality separate from the technological systems, but the very *condition of the technology's existence* and the specific form that the technology takes; 2) the present day state of trust is the result of a long, gradual, and incomplete process of *publics becoming constituted with computing*; and 3) trust today is a result and context of "constitutional moments," *moments of rupture in constitutional orders* that are the result of interplay between legal, technical, and anthropological factors. These aspects point to sites of intervention that people can activate to shape the current state of trust and they suggest research agendas that scholars of law, society, and technology can pursue to make sense of this crucial area of sociotechnical relations today.

Keywords: digital technologies; constitutionalism; trust; vulnerability; public computing.

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