Reading Elinor Ostrom In Silicon Valley: Exploring Institutional Diversity on the Internet

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ABSTRACT

This paper, from the Design Fictions track at ACM GROUP 2016, is a review of a non-existent book, *Reading Elinor Ostrom in Silicon Valley: Exploring Institutional Diversity on the Internet*, edited by a non-existent researcher named Kieran X. Yuval and published in 2021 (a date, at time of writing, decidedly in the future) by NJU Press, a non-existent academic press. In contrast to the fictitious nature of the editor, book, and press, Elinor Ostrom was a real person and everything described about her and her work in the paper is, to the best of the author's knowledge, true.

CCS Concepts

•Social and professional topics → Computing and business; Commerce policy; •Information systems → *Electronic commerce;*

Keywords

Social science; sociotechnical systems; political economy; Elinor Ostrom; Institutional Analysis and Development framework; institutional diversity; online labor markets; on-demand economy; Amazon Mechanical Turk; Uber; Lyft; reputation systems; Turkopticon; online access to scholarly publications; intellectual property; open access; scholarly publishing; online harassment; platform cooperativism; governance; regulation; policy

1. BOOK INFORMATION

Reading Elinor Ostrom in Silicon Valley: Exploring Institutional Diversity on the Internet. Kieran X. Yuval, ed. Cambridge, NC: NJU Press, 2021. 366 pp. US$24.95.

2. SUMMARY OF THE REVIEW

Reading Elinor Ostrom in Silicon Valley is a collection of empirical and theoretical contributions from researchers in the "traditional" social sciences, economics, human-centered computing (HCC), and science and technology studies (STS) that explores four major contemporary "information society" developments—the "on-demand economy," online access to scholarly publications, online harassment, and "platform cooperativism"—from a perspective that integrates the sociotechnical and the political-economic. The contributions to the volume consider the phenomena under study through the lens of the Institutional Analysis and Development (IAD) framework, developed over four decades by the political economist Elinor Ostrom—the first woman and first non-economist to win the Nobel Prize in economics (in 2009)—and her colleagues at the Workshop on Political Theory and Policy Analysis at Indiana University. The detailed

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DOI: 10.1145/2957276.2957311

empirical and analytical contributions to the volume integrate accepted HCC and STS methods such as ethnography, research through design, and action research with approaches common in IAD scholarship, including game theory and empirically based agent-based modeling. In doing so, the collection builds a conceptual lens linking detailed interpretivist empirical research in HCC and STS to practical "macro" questions about *both* system design and operation *and* economic and institutional policy—questions that are always, in practice, interlinked. By shedding light on these interlinked dynamics, this integrative conceptual lens reveals new options for researchers, designers, entrepreneurs, policy makers, users, and others to work together to evolve existing "social-economic-political-technical" systems—and build new ones—in ways that allow them to more substantively and sustainably address the needs and concerns of diverse stakeholders, including "on-demand" workers, scholars unable to afford access to expensive journals, and people subject to harassment in online spaces. In a moment in which seemingly ever more complex and politically opaque sociotechnical systems subtend seemingly ever-greater swathes of social, economic, and political life, reshaping interpersonal relationships, work, and politics in their images—or in the not-always-democratic visions of their founders and funders—this is a timely contribution.

3. REVIEW

3.1 Overview of the book

Reading Elinor Ostrom in Silicon Valley is a riotously interdisciplinary collection of empirical and theoretical contributions from researchers in the "traditional" social sciences, economics, human-centered computing (HCC, meaning, roughly, "human-computer interaction [HCI] and computer supported cooperative work [CSCW]"), and science and technology studies (STS) that explores four major contemporary "information society" developments from a perspective that integrates the sociotechnical and the political-economic. Substantively, the book examines four topics at the intersection of computing, economics, and governance that have in recent years garnered increasing attention from a broad range of international publics, including practicing designers, entrepreneurs, policy makers, social scientists, and HCC and STS researchers: the "on-demand economy"; access to scholarly publications; online harassment; and "platform cooperativism," a movement developing democratically governed alternatives to for-profit information systems. The contributions are unified by the theoretical project of actionably linking the Institutional Analysis and Development (IAD) framework, developed over four decades by the political economist Elinor Ostrom and her colleagues at the Workshop for Political Theory and Policy Analysis at Indiana University, with the research discourses of human-computer interaction (HCI) and computer-supported cooperative work (CSCW). The contributions show how the IAD framework, originally crafted to support analyses of the dynamics of "social-ecological systems," can also scaffold broad-ranging analyses that illuminate the interlinked technical and socioeconomic dynamics of information systems—and reveal practical strategies for more fully addressing the concerns of a broad range of stakeholders in their design and operation. Following in the tradition established by Ostrom and her collaborators in their study of common pool resources (see especially [37]), the contributors weave together an eclectic collection of methods: detailed fieldwork and interpretive analysis, large-N surveys and other quantitative datasets (e.g., server logs), and empirically based agent based models (i.e., computer simulations) of sociotechnical systems.

After an introduction to the IAD framework, the book divides into three major parts. Part I contains six detailed, interdisciplinary, mixed-method case studies of socioeconomically controversial sociotechnical systems and phenomena: the transportation network industry, focusing on Uber and Lyft, their struggles with regulators, and their competition with taxi companies; hospitality platform Airbnb; "microtask marketplace" Amazon Mechanical Turk; online harassment; the technical, economic, and legal struggle to control online access to scholarly publications—and the links between the practices of corporate publishing giants such as Elsevier, university libraries, and "guerrilla open access" infrastructures such as AAAAARG.ORG, Science Hub, and Library Genesis; and finally, Bivy, a cooperatively managed protocol emerging as a potential competitor to centralized for-profit social networks such as Facebook and Twitter. While each case begins with one or more named sociotechnical systems or with particular instances of a phenomenon, the final object of study, following Ostrom's own emphasis (see e.g. [35]), is always a "polycentric" system of interlinked technologies, institutions, actors, and practices, the dynamics it exhibits, and the outcomes it produces for different stakeholders. The computational, legal, economic, and sociological aspects of the system are described quantitatively and qualitatively, and a working model of the system is constructed using the concepts offered by the IAD framework. This working model is then embodied in a computer simulation—an empirically based agent based model (see [18])—that is manipulated to explore potential consequences of past or possible alterations or interventions within the system. Agent based simulations of the transportation network, for example, show how the development of an independently operated reputation system for Uber and Lyft passengers—and its adoption in 2017-18 by the majority of "serious" drivers on both platforms—changed the incentives facing passengers and led to an increase in driver earnings, tenure, and satisfaction.

Part II is theoretical. Its three chapters—focusing respectively on power, reputation and reputation systems, and cooperative governance—draw on the empirical material and models presented in Part I to explore these three themes of long-running interest in the social sciences in the context of massively distributed, interlinked information infrastructures. The chapter on power links prior game-theoretic treatments of the topic with the concepts of the IAD framework in the context of the empirical cases presented in Part I to examine how various social-economic-political-technical arrangements concentrate or distribute power, how the distribution of power affects both long-term system sustainability and outcomes for different stakeholder groups, and how specific interventions can redistribute power. Reputation systems appear in several chapters in Part I, and the chapter on reputation and reputation systems in Part II synthesizes these discussions and develops a series of agent-based models to discuss the topic in more general terms. The final chapter in Part II, on cooperative governance, follows a similar pattern, drawing on the empirical and theoretical work of

Ostrom and her colleagues on self-governance among users of common pool resources (e.g., [30, 31, 8, 5]) to draw general lessons from the details of the cases discussed in Part I.

Part III considers theory and method within HCC research informed by the IAD framework. The first three chapters of Part III connect the IAD with three well-loved theoretical traditions in HCC: activity theory, actor-network theory, and social psychology. The last three chapters consider the use of the IAD framework within research guided by three related but distinct methdological traditions in HCC: action research, research through design, and participatory design. The three methodological chapters offer the collection's sharpest development of four intertwined themes that recur in the empirical chapters: the diversity of users and stakeholders other than users in social-economic-political-technical systems, the potential for conflicts of interest among stakeholders, the inevitability of "politics" in the management of systems in which conflicts of interest arise, and the potential for structured dialogue to reveal shared interests "beneath" the conflicts—shared interests that can point the way to satisfactory resolutions.

A concluding chapter reflects on the contributions as a whole and offers an agenda for future work.

3.2 Elinor Ostrom and the Institutional Analysis and Development framework

Elinor Ostrom was the first woman and the first non-economist to receive the Nobel Prize in economics. She received the 2009 prize for her "analysis of economic governance, especially the commons" [28]. She describes her work as part of contemporary interdisciplinary developments in economics and political science that build on traditional game-theoretic frameworks but reach beyond "classical" theories that assume that all economic activity goes on in a "dichotomous world" comprised only of "'the market' and 'the state"' ([35], p. 1). In contrast to the too-simple assumptions and prescriptions of classical economics, Ostrom and her colleagues within "new institutional economics" and at the Workshop on Political Theory and Policy Analysis at Indiana University found that "humans...have complex motivational structures and establish diverse private-for-profit, governmental, and community arrangements that operate at multiple scales to generate productive and innovative as well as destructive and perverse outcomes" ([35], p. 1). That is, people start businesses, make laws, establish government agencies, and develop informal and formal not-for-profit arranagements to realize their complex goals—and sometimes these efforts end well and sometimes they end badly. Institutional form alone does not predict success, failure, or the distribution of costs, risks, benefits, and unintended consequences. Rather, outcomes in institutional settings are shaped by a diversity of factors, including the actors involved; the institutional roles they occupy and the actions afforded them through those roles; the information available to them about the potential outcomes of their actions, including the potential actions of other actors in response; and external conditions, including both "biophysical" conditions (e.g., the number or growth rate of fish in a fishery) and external social or institutional conditions (e.g., the actions of actors in larger-scale institutions such as governments).

Over four decades, Ostrom and her colleagues conducted extensive field studies and laboratory experiments on the social and ecological dynamics of shared "common-pool resources" such as forests, fisheries, and water resources, and extensive meta-analyses of these and other field studies and experiments (see e.g. [29] and [33]). They found that the complexity of factors influencing institutional outcomes means that diverse possibilities exist for the sustainable long-term governance of such common-pool resources. This finding contrasted with previous arguments arising from classical theories which assumed most actors to be relatively short-sighted, self-interested, and uncommunicative. These theories proposed that actors should be expected to overexploit shared resources, leading to resource collapse (e.g., [15]), and that such overexploitation could only be prevented by either privatization or government intervention and control. Ostrom and her colleagues found, however, that *in some but not all cases*, resource users themselves can develop and enforce rules to disincentivize overexploitation and ensure the long-term sustainability of the resource. Indeed, they found empirical evidence of many really existing "long-enduring, self-organized, and self-governed common-pool resources" ([29], Ch. 3). The ability of users of a given common-pool resource to self-govern—i.e., to themselves devise and enforce rules that prevent overexploitation—depends on a diversity of factors, some of which can be affected by users or actors in larger scale institutions (e.g., governments) and some of which cannot (e.g., the extent to which the resource affords the demarcation of clear boundaries and monitoring). (These are summarized in Chapter 1 of *Reading Elinor Ostrom in Silicon Valley*, in [34], and in Chapter 9 of [33].) The empirical discovery that resource users could under some circumstances resolve "commons dilemmas" by developing and enforcing rules governing resource use led to the development of the Institutional Analysis and Development (IAD) framework to explore and explain the interrelated factors leading to success or failure (i.e., to "long-surviving resource institutions" [35] or to resource collapse). The framework allows stakeholders, researchers, and policy analysts to at least schematically represent real-world institutional settings, explore their dynamics, and consider possible outcomes of change.

3.3 Contribution

The topics taken up in *Reading Elinor Ostrom in Silicon Valley*—the "on-demand economy," online access to scholarly publications, online harassment, and cooperative governance of information systems—are hardly new to HCC researchers. Indeed HCI and CSCW researchers contributed early to the study of the "on-demand economy" (e.g. [38, 17, 21, 24, 39, 14, 23, 6, 11]) and online harassment (e.g. [2, 26]), and participated directly in the emergence of platform cooperativism (e.g. [1]).

On the theoretical front, the claim that humans have complex motivations, establish diverse structures for their collective efforts, and experience success or failure based on a diversity of factors including but not limited to institutional form likely comes as no surprise for many social researchers in HCC with training in, or exposure to, the interpretive social sciences or humanities. Indeed the claim resonates with long-running critiques of the naïve technological optimism and determinism sometimes unwittingly promulgated by enthusiastic proponents of new sociotechnical designs—and social researchers within HCC (especially CSCW) have offered some of the most pointed and action-

able of such critiques [22, 12, 13, 42]. And the topic of stakeholder self-organization is a long-running interest in HCC, especially CSCW (e.g., [19]), in particular in studies of free/open source software development (e.g., [4, 3]) and Wikipedia (e.g., [36, 44]). Indeed elements of the IAD framework were used as early as 2007 to analyze governance on Wikipedia [43].

Yet existing systems and their organizations rely on and support particular economic aims, values, and logics (see e.g. [40, 27, 10, 20]); beyond the often-cited cases of free/open source software and Wikipedia, the final criteria shaping "socioeconomic-sociotechnical" change in the last few decades, at least where the main technologies involved are computational, seem still to be financial. The design and administration decisions of the operators of the large systems on which many of us (some ambivalently) rely—Amazon, Elsevier, Facebook, Google, Twitter, Uber, and so on—seem much more often oriented by operators' fiduciary obligations (and hopes) than by an organizationally-supported intention to democratically negotiate the needs of a broad variety of stakeholders, or to support a robust and vibrant democratic culture generally. New entrants with different aims face severe challenges—perhaps most notably, limited access to capital. While HCC has a long tradition of developing technologies with democratic aspirations, even those systems held up as examples of successful sociotechnical interventions in asymmetrical power relations (in the last five years, e.g., [7, 17]) are at best small victories in the face of the continued dominance of nondemocratic systems.

The contributors to *Reading Elinor Ostrom in Silicon Valley* show, through their institutional analyses of existing, dominant systems, of "successor systems" [9, 25] that alter the dynamics of those systems, and of cooperatively-operated systems that aim to compete with them, that major information infrastructures can be sustainably democratically funded and operated—and that democratically operated information infrastructures can compete effectively in a market dominated by hierarchically-governed for-profit organizations. They argue—and the empirical material in the volume lends weight to the argument—that democratically operated infrastructures offer the promise of achieving, on balance, better outcomes for the increasingly broad diversity of stakeholders to information systems. They make a strong case that the institutions of HCC research should welcome the efforts of HCC researchers to study, celebrate, support, and extend such systems—and, as needed, build new ones, rather than marginalize such efforts by labeling them unacceptably political or otherwise unscientific. The empirical chapters in the volume offer detailed accounts of the increasingly significant contributions of HCC researchers in expanding democratic influence over crucial information infrastructures, and the theoretical material offers conceptual and methodological tools for others who might wish to follow in their footsteps. The sophisticated but actionable analyses, models, and even predictions offered throughout the volume show convincingly that the IAD framework offers a powerful complement to existing HCC theory and method for researchers interested in understanding—and shaping—the governance of sociotechnical-socioeconomic systems. Taken as a whole, the volume offers a first draft of a coherent approach for analyzing and evolving existing social-economic-political-technical systems—and for building new ones—in ways that sustainably and substantively address the needs and concerns of their diverse stakeholders, rather than prioritizing the prerogatives of a powerful few.

Like the woman whose work guides the analyses and proposals of its contributors, *Reading Elinor Ostrom in Silicon Valley* is openly and unapologetically biased in favor of democratic governance. Ostrom once wrote that she "share[d] a deep conviction that democratic systems of government are the highest form of human governance yet developed" [32], and editor Yuval and her co-contributors leave no room for doubt that they share this conviction. Their evaluations of existing systems and proposals for new ones elevate contextually-defined criteria of democratic participation, inclusion, and distributive and procedural justice to the same importance as traditional technical and economic criteria such as efficiency and resource sustainability. But like Ostrom [32], they are far from blithely optimistic about the future of democracy; like Ostrom, they observe that "governing the commons" is "always a struggle" [5]. The struggle to evolve democratic social-economic-political-technical systems will appear in many forms—organizational, technical, intellectual, and political—and many places—corporate boardrooms, universities, political institutions, and the everyday practices of users, designers, operators, and other stakeholders. A powerful affirmation that complex technology and democracy can sustainably coexist, and that HCC researchers can contribute meaningfully to that coexistence, *Reading Elinor Ostrom in Silicon Valley* is a significant contribution to that struggle.

4. ACKNOWLEDGMENTS

I thank Katie Pine for helpful discussions about this text.

5. DISCLAIMER

This paper reflects the personal views of its author. It was not directly materially supported, reviewed, or approved by, nor does it bear any relation to any official position of, Industriegewerkschaft Metall.

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