GOVERNING ON THE EDGE OF CHANGE
A Report from the Next Policy Frontier

POLICYBRIEF

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SUMMARY

Imagine, for a moment, a world that is rapidly changing along three dimensions:

Structure: a shift from hierarchies to networks; **Ownership:** transitions from proprietary to open-source models; and **Exchange:** a movement from classic markets and commodities to a gift or contribution economy. These shifts are creating new ways of driving social and technological innovation and simultaneously challenging traditional notions of how we govern. For public policymakers, this emerging zone creates opportunities to craft next generation policy, leadership, and management strategies that can work on the edge of change.

Strange things—sometime exciting and unexpected things—happen at the edge, a place that can inspire both creativity and craziness. We can be "on edge," be "pushed to the edge," or be "on the cutting edge." As gonzo journalist Hunter Thompson once wrote, "[T]here is no honest way to explain [the edge] because the only people who really know where it is are the ones who have gone over."[1] But if one can avoid falling off the precipice, edges often provide some unique perspectives on our social, cultural, or scientific landscape.

Nature provides important lessons about why this happens. In ecosystems, diversity, complexity, and novelty increase in edge habitats. Life becomes messy, more varied, and less predictable. Edges attract certain species that thrive in these boundary areas.[2] Researchers mapping regions in eastern Australia found that extroverts gravitated to undeveloped, wilder coastal areas, whereas introverts preferred inland and settled areas.[3]

Edges often represent frontier spaces where novelty flourishes, where the tolerance for ambiguity is high, and where one is often confronted with what Peter Bernstein has called the "wildness"—a world of change and uncertainty that confounds easy decisions, undermines predictions, and can often lead to miscalculations by decision makers and governments.[4]

So if we are inexorably moving toward the edges in our global society, those in government need to know about it and think about the implications. Let's imagine a world that is changing along three dimensions simultaneously (figure 1):

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- **Structure:** a shift from hierarchies to networks

- **Ownership:** transitions from proprietary to open-source models

- **Exchange:** a movement from classic markets and commodities to a gift or contribution economy[5]

This entire system is emergent, and the rate of change is accelerated through underlying technological innovations such as the Internet. Policymakers peering at this new constellation from the comfortable perspective of our legacy institutions may suffer the illusion of pre-Copernican astronomers and believe this world revolves around them—but it may not.

FIGURE 1. EDGE GOVERNANCE: THE THREE DIMENSIONS OF CHANGE
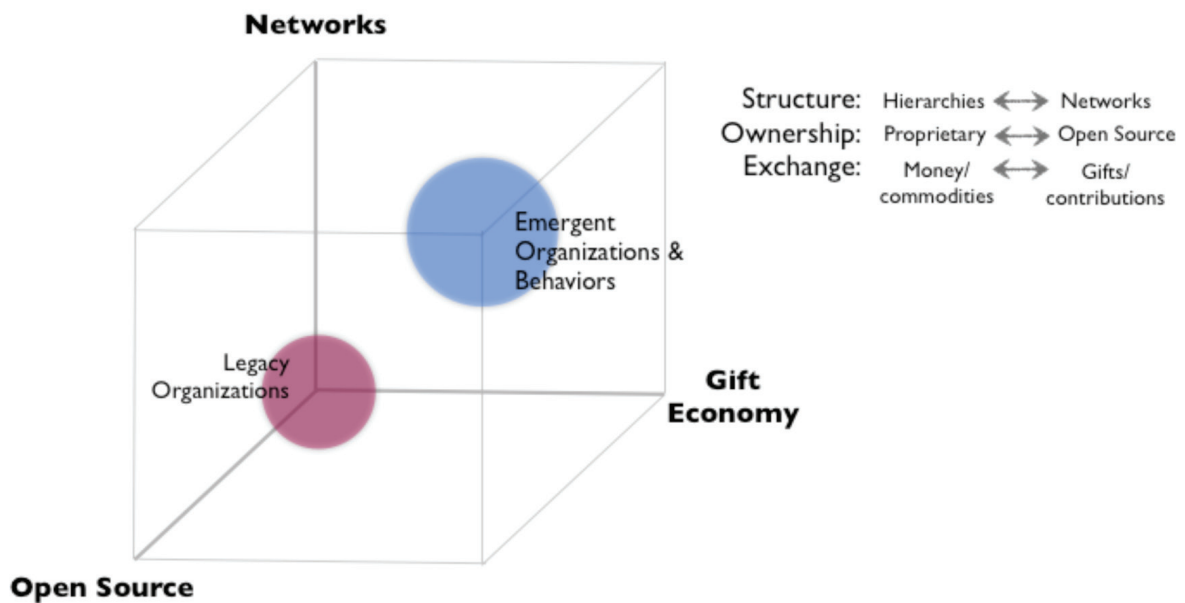
Historically, public policies were developed to function in bounded systems such as a firm or state that operated within traditional markets with clearly defined property rights. Government tends to live comfortably in the bottom right portion of figure 1, but what is exciting, transformational, and worth the collective attention of government in the future is in the upper right—networks and open-source sharing occurring in emergent, highly distributed systems. A few examples might illustrate the nature of the change and the choices we confront.

Over the past three years, more than 2,000 people have joined a global community called "Do-It-Yourself Biology"[6] that has shifted the ability to experiment with biology to noninstitutional settings and has allowed people to share biological code in open-source depositories. How does one support innovation in this emergent network of actors while guaranteeing biosafety and security? This question is just the tip of the transformational iceberg. We can look at the digital fabrication revolution using three-dimensional printers and depositories such as

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Thingiverse.[7] Need an iPod case, a coat hanger, or parts for a drone? Download the code and print it. If you can improve on the design, you can share that also. In the future, these machines will make other machines, which will assemble other machines, thereby bringing design and production closer to an integrated, biologically based paradigm. But an equally fascinating part of this revolution is social and involves the communities that have organized around the technologies and the exchange of know-how and data.

Internet hacker Eric Raymond talked about the *cathedral* and the *bazaar*, contrasting proprietary software development, mostly inside firms, with the open-source community that emerged in the 1970s and 1980s. Today, the boundaries are not so clear and the bazaar has spilled over into the cathedral space. The monks and hawkers have to coexist and cowork in a new world where the rules are ill defined and in flux.

The military saw some of these structural changes coming with the rise of networked, nonstate actors that required a shift to netcentric warfare strategies capitalizing on new technologies combined with nontraditional intelligence and operational paradigms. As RAND sociologist David Ronfeldt noted, there was a historic evolution under way from tribes to markets, to hierarchies, and to networks, along with their various combinations and permutations, which presented challenges to classic top-down hierarchical military operations and command-and-control systems.[89]

As the Internet expanded, we also began to witness large groups of people self-organizing around tasks such as computer programing. Estimates of the time to create various versions of the Linux operating system, which involved 30 million to 50 million single lines of code, ranged from 8,000 to 14,000 person-years (valued by various studies at $1 billion to $2 billion). As one person involved in Linux coding observed when asked why the community donates its time: "I do it to help people. I do it because [if I] help others someday others will help me."[10]

Hints of nonmonetary motivators to human exchange and sharing already existed in Adam Smith's 1759 *Theory of Moral Sentiments*[11] and E. P. Thompson's studies of early markets in 18th-century England,[12] but the Internet and social media have made exchange much easier and faster. What is driving innovation on the edge is not necessarily ownership and money but often involves reputation, increased self-esteem, status, acceptance, friendship, or altruism.[13]

These changes have some obvious ramifications for governance. For instance, oversight mechanisms such as regulation may not work well in large, spatially distributed networks; market-based incentives

may fail outside of traditional markets; intellectual property regimes will be resisted in open-source cultures; and new safety or security threats may emerge from edge spaces.

Faced with these shifts to the edge, people have proposed a number of possible solutions, such as soft power, nudge strategies, and "postsovereign systems," but more fundamental changes are needed.[14] We have hit a point that the late political scientist Elinor Ostrom once termed an *institutional choice situation,* where a number of governance options exist simultaneously.[15] Identifying governance approaches that work in emergent systems is a looming and important governance challenge.

For instance, edge governance will require new leadership and management paradigms that do not normally flourish in government as we know it—approaches that some have termed *connective leadership* suitable for ecosystems of fluid networks.[16] Organizations will need multiple characteristics that are often foreign in hierarchical, task-oriented bureaucracies: openness, the ability to self-organize and adapt, and a willingness to drive decision making down to levels lower than what centralized authority might normally prefer.[17] Governance approaches may need to rely less on law and more on improvisational networks of social actors operating within consensual frameworks, and public engagement may become a valid and effective contributor to governance.

Workforce preparation will have to change. Many of our universities are still preparing people for 30-year government careers climbing 40 steps in the federal pay ladder. Increasingly, people are looking elsewhere. If people are hacking computer code, biology, and fabrication, why not bring the same gusto and innovation to public policy by setting up shared working spaces for policy wonks and locating them with other people and groups working on the edge?

The inherent uncertainty in these edge zones and their cross-boundary character will require a type of governance that has been described recently as more art than science and must "facilitate effective interactions between a range of current and emerging social actors … to ensure that all parties have the opportunity to express their perspectives and interests."[18]

The late novelist Kurt Vonnegut once noted that, "Out on the edge you see all kinds of things you can't see from the center."[19] If he was right, then the edge is where social and technological innovation will happen and the challenge to government is to define an effective role in this new universe.

WonkaLab

The Hackspace for Policy Wonks

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ENDNOTES

1   Hunter Thompson, *Hell's Angels* (New York: Random House, 1967).

2   Richard T. T. Forman and Michel Godron, *Landscape Ecology* (New York: John Wiley & Sons, 1986).

3   D. J. Walmsley, "Personality and Regional Preference Structures: A Study of Introversion-Extroversion, *The Professional Geographer* 34, no. 3 (1982): 279–88.

4   Bernstein, Peter, *Against the Gods: The Remarkable Story of Risk* (New York: John Wiley & Sons, 1996).

5   Recent work by Joshua Gans at the University of Toronto and Fiona Murray at the Massachusetts Institute of Technology has focused on what they term the *contribution economy* and examines the drivers behind knowledge sharing and the role of individuals in knowledge creation. See http://contributioneconomy.net/about/ for more information.

6   This global community can be found at http://diybio.org/.

7   Thingiverse allows community members to share their digital designs with the world. See http://www.thingiverse.com/. For more information about the digital fabrication revolutions, see Neil Gershenfeld, "How to Make Almost Anything: The Digital Fabrication Revolution," *Foreign Affairs* 91. no. 6 (2012): 43–57 http://www.foreignaffairs.com/articles/138154/neil-gershenfeld/how-to-make-almost-anything?page=show.

8   David Ronfeldt, "In Search of How Societies Work: Tribes First and Forever," Working Paper WR-433-RPC, RAND, Santa Monica, CA, http://www.rand.org/pubs/working_papers/WR433.html

9   Also see: David Alberts & Richard Hayes 2003. *Power to the Edge: Command, Control in the Information Age*, Washington, DC: DoD Command and Control Research Center.

10   Response by Mono12 to the question "Why do you think the Linux community donates its time to supporting the adoption of Linux," http://answers.yahoo.com/question/index?qid=20100409100337AA29Eu7.

11   Adam Smith, *Theory of Moral Sentiments* (Cambridge, U.K.: Cambridge University Press, 2002 [1759]). Smith noted, "How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortunes of others, and render their happiness necessary to him, though he derives nothing from it, except the pleasure of seeing it."

12   E. P. Thompson, "The Moral Economy of the English Crowd in the Eighteenth Century," *Past and Present* 50 (1971): 78–98.

13   Such characteristics are an example of what French anthropologist Pierre Bourdieu termed *symbolic capital* built on a "strategy of accumulating a capital of honor and prestige," which can be converted into reciprocal exchange and potentially economic capital. See Pierre Bourdieu, *Outline of a Theory of Practice* (Cambridge, U.K.: Cambridge University Press, 1977), 174.

14   Jessica T. Mathews, "Power Shift," *Foreign Affairs* 76, no. 1 (1997): 50–66.

15   Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Governance* (Cambridge, U.K.: Cambridge University Press, 1990).

16   See, for instance, Jean Lipman–Blumen, *Connective Leadership: Managing in a Changing World* (Oxford, U.K.: Oxford University Press, 1996).

17   Neil Harrison, "Good Governance, Complexity, Institutions, and Resilience," paper presented at the Open Meeting of the Global Environmental Change Research Community, Montreal, October 16–18, 2003.

18   Joy Y. Zhang, Claire Marris, and Nikolas Rose, "The Transnational Governance of Synthetic Biology: Scientific Uncertainty, Cross-Borderness and the 'Art' of Governance," BIOS Working Paper 4, London School of Economics, London, 2011, 3.

19   Kurt Vonnegut, *Player Piano* (New York: Rosetta Books, 2000 [1952]), 87

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