

THE FUTURE OF INTERNET LAW

Review of *The Future of the Internet—And How to Stop It* By Jonathan Zittrain

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INTRODUCTION

Jonathan Zittrain's *The Future of the Internet—And How to Stop It* is essential reading for anyone whose work makes contact with the Internet.¹ Zittrain argues that the secret of the Internet's success is its "generativity": its "capacity to produce unanticipated change through unfiltered contributions from broad and varied audiences."² *The Future of the Internet* convincingly demonstrates that generativity is the core principle responsible both for the Internet's extraordinary value and the extraordinary dangers it faces.

The book marks the coming of age of an important new intellectual approach in Internet law, which we call "architecturalism." Zittrain and other scholars inspired by Lawrence Lessig³ have identified the social values embedded in computer and network engineering principles, with bold and urgent implications for legal policy. Although their work is generally lumped in with other "cyberlaw" scholarship, architecturalists' technical grounding gives them a uniquely synoptic perspective on the legal challenges posed by computer technologies. *The Future of the Internet* is Exhibit A in the case for the power of architecturalist analysis.

This Review thus uses the occasion of the publication of *The Future of the Internet* to identify the architecturalist movement, explore its history, and set an agenda for its future.

Zittrain's essential analytical move is to isolate and characterize generativity. Generative technologies like Lego blocks can be combined and reconfigured in new and surprising ways by their users. Non-generative technologies, like light bulbs, can only be used in one or a few

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¹ JONATHAN ZITTRAIN, *THE FUTURE OF THE INTERNET—AND HOW TO STOP IT* (2008).

² *Id.* at 70.

³ LAWRENCE LESSIG, *CODE: AND OTHER LAWS OF CYBERSPACE* (1999).

predetermined ways. This distinction enables Zittrain to show how the programmability of general-purpose computers makes them a highly generative technology—and how the Internet amplifies that generativity by enabling far-flung individuals to collaborate in ways no one at all could have foreseen.

Zittrain connects generativity to the Internet's greatest value: its infinite capacity to produce novel connections, uses, and ideas. The generative Internet has given us email and Wikipedia, YouTube and lolcats. But he also explains that generativity has a dark side: the generative Internet is also characterized by spam, viruses, and privacy disasters. Thus, he argues, the policy challenge of the coming years will be to respond intelligently to those threats without choking off generativity itself.

Zittrain's account of a generative Internet is both groundbreaking and unquestionably accurate. It elegantly encapsulates many features of society's experiences with the Internet, and it improves on previous work on "openness" and "freedom" online by identifying more clearly how architectural features of the Internet affect those experiences. Generativity provides a compelling theoretical link between network engineers' ability to build a network that can seamlessly connect hundreds of millions of computers, developers' ability to deploy innovative new applications, and users' ability to share their creativity with the world.

Even as we celebrate Zittrain's perceptive identification of the core value of the Internet and his masterful portrait of the coming struggles over its future, we offer a few concerns with his policy prescriptions. Because he sees the Internet's generativity as both its greatest strength and its greatest weakness, he concludes that some strategically-set limits on generativity will be necessary to keep the Internet as a whole broadly generative. The problem with such paradoxical destroy-the-village-in-order-to-save-it logic is that one needs a principle to distinguish healthy firebreaks from out-of-control forest fires. We're not sure that Zittrain has such a principle. We illustrate our discomfort with a discussion of the ambiguous role the Apple iPhone plays in his Internet morality play—generative hero or locked-down villain?

Our concerns about some of Zittrain's recommendations do not, however, detract from our appreciation of his larger project. *The Future of the Internet* is an outstanding example of architecturalism: an approach to Internet law scholarship that emphasizes the interrelationship of technical, legal, and social factors. This Review situates *The Future of the Internet* within cyberlaw to show that architecturalism is a freestanding, coherent achievement within the cyberlaw's jumbled districts.

Early Internet law scholarship was obsessed with questions of jurisdiction and place: could terrestrial governments effectively exert authority over

activities “located” online? Valuable work in this tradition continues,⁴ but Lessig and a few fellow scholars writing in the late 1990s effectively exploded one of the key assumptions upon which so much of this work depended: that the Internet’s architecture was itself beyond human—and governmental—power to shape. Post-Lessig, a large and diverse group of scholars has taken to heart the lesson that the Internet’s architecture is regulable, asking important questions about who should exercise that power, and when, and to what effect.⁵

Architecturalists have participated in these important discussions, but they also drew a very different lesson from Lessig’s famous slogan that “code is law.” Architecturalists have reasoned that if the Internet’s design is a technically and socially contingent fact, we ought to pay close attention both to the unforced technical choices made in setting it up and to the consequences of those choices. Zittrain’s theory of generativity is a preeminent example of such insight, but hardly the only one. Yochai Benkler’s theory of networked peer production⁶ and Tim Wu’s theory of network neutrality⁷ both leverage an engagement with network technology to legal effect.⁸ These are rich theories of how specific design choices—universal connectivity, neutrality, modularity, layering, standardization, decentralization, and end-to-end design—have profound effects on the fate of all those who use the Internet.

⁴ See, e.g. DAVID POST, IN SEARCH OF JEFFERSON’S MOOSE: NOTES ON THE STATE OF CYBERSPACE (2008).

⁵ See, e.g., JACK GOLDSMITH & TIM WU, WHO CONTROLS THE INTERNET? ILLUSIONS OF A BORDERLESS WORLD (2006).

⁶ YOCHAI BENKLER, THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM (2006).

⁷ Tim Wu, *Network Neutrality, Broadband Discrimination*, 2 J. TELECOMM. & HIGH TECH. L. 141 (2003).

⁸ See also, e.g., Susan P. Crawford, *The Internet and the Project of Communications Law*, 55 UCLA L. REV. 359 (2007); Susan P. Crawford, *Internet Think*, 5 J. TELECOMM. & HIGH TECH. L. 467 (2007); Danielle K. Citron, *Open Code Governance*, 16 U. CHI. LEG. F. 355 (2008); Danielle K. Citron, *Technological Due Process*, 85 WASH. U. L. REV. 1249 (2008); Jerry Kang & Dana Cuff, *Pervasive Computing: Embedding the Public Sphere*, 62 WASH. & LEE L. REV. 93 (2005); Neal Kumar Katyal, *Digital Architecture as Crime Control*, 112 YALE L.J. 2261 (2003); Sonia K. Katyal, *Privacy v. Piracy*, 7 YALE J.L. & TECH. (2004); Orin S. Kerr, *The Problem of Perspective in Internet Law*, 91 GEO. L.J. 357 (2003); Mark A. Lemley & Lawrence Lessig, *The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Age*, 48 UCLA L. REV. 925 (2001); Randal C. Picker, *Rewinding Sony: The Evolving Product, Phoning Home, and the Duty of Ongoing Design*, 55 CASE W. L. REV. 749 (2005); Lawrence B. Solum & Minn Chung, *The Layers Principle: Internet Architecture and the Law*, 79 Notre Dame L. Rev. 815 (2004); Lior Strahilevitz, *Charismatic Code, Social Norms, and the Emergence of Cooperation on the File-Swapping Networks*, 89 VA. L. REV. 505 (2003); Tim Wu, *Wireless Carterfone*, 1 INT’L J. COMM. 389 (2007); Tim Wu, *When Code Isn’t Law*, 89 VA. L. REV. 679 (2003); Jonathan Zittrain, *The Generative Internet*, 119 HARV. L. REV. 1974 (2006).

To non-architecturalists, architecturalism can seem difficult to assess, too narrowly focused on descriptive accounts of engineering principles, and too little engaged with broader normative themes. Indeed, some have criticized Zittrain's book precisely along these lines. These criticisms miss the point of architecturalist scholarship: *engineering design is just as much a normative enterprise as law is*. Architecturalism does for computer systems what Legal Realism did for legal systems: it lays bare the contingency of seemingly inevitable rules and makes clear their connection to urgent questions of social policy.

This Review rebuts these critiques of Zittrain and of architecturalist scholarship. It uses *The Future of the Internet* as a case study of the structure, power, and distinctiveness of the architecturalist approach. It identifies four defining characteristics of good architecturalist scholarship: careful technical analysis, dynamism about technical change, rich interdisciplinarity, and legal boundary-crossing.

Technical Analysis. Whether architecturalists have an educational or professional background in the computer industry or are self-taught, they share a commitment to getting the technology right. Zittrain, a former sysop, dove into the deliberations of the network engineers who crafted the protocols on which the Internet still runs. He writes with the authority of a firsthand understanding of the technical details. In an age when law review pages are still sadly littered with utterly infeasible technical proposals, airily abstract models of the law's interaction with unspecified computer "technologies," self-evidently absurd overgeneralizations, and what-if stories more akin to science fiction than rigorous scholarship, architecturalism's commitment to accuracy gives it a relevance often lacking in other work.

Interdisciplinarity. Even for an age of interdisciplinary legal scholarship, architecturalists are voracious readers. In addition to their grounding in computer science, architecturalists have learned from anthropologists, historians, sociologists, librarians, philosophers, communications and information scholars, and many others. The question of how people engage with technology, investing it with particular values and ideologies, is central to the architecturalist project. Zittrain's work is thoughtful about the distinctiveness and diversity of online culture; his story of generativity is as much about *social* generativity as *technical* generativity.

Legal Boundary-Crossing. Frank Easterbrook famously objected that Internet law had no disciplinary coherence; better to disaggregate it back into familiar legal genres of contract, tort, property and the like.⁹

⁹ Frank Easterbrook, *Cyberspace and the Law of the Horse*, 1996 U. CHI. LEGAL F. 207.

Architecturalism asserts that Easterbrook had it exactly backwards; the Internet characteristically dissolves traditional boundaries between bodies of law. Architecturalists systematically explore the rich interconnections between legal fields generated by the Internet's technical features. *The Future of the Internet* brilliantly weaves intellectual property, tort, privacy, constitutional law, and many other doctrinal fields into a single, coherent picture.

Dynamism. Whether triumphalists or pessimists, many other Internet law scholars are essentialists about the nature of Internet technology. They extrapolate from isolated examples to conclude that all of “cyberspace” has a unitary nature, or prescribe a single miracle-cure “solution” to all the Internet's ills. Architecturalists, however, are closely attuned to the ways in which technology shapes and is shaped by human forces. The basic axiom of architecturalism—it was not always thus and may not always be so—is a story of dynamic change. *The Future of the Internet* thoughtfully unpacks the ways in which Internet technologies become victim of their own success and rejects the false wisdom of a single static “ideal” design.

This Review proceeds as follows. Part I will explain and critique Zittrain's thesis that the Internet is best understood as a generative technology. Part II will then situate *The Future of the Internet* and architecturalism within the intellectual history of Internet law. Part III, in turn, will offer a full-throated defense of architecturalism's value in the face of likely critiques. Finally, Part IV concludes.

Lessig's *Code: And Other Laws of Cyberspace*, published a decade ago, made the legal world sit up and pay attention to the Internet. We believe that *Code*, like *The Future of the Internet*, was as important for the brilliance of its methodology as for its policy prescriptions. Too many scholars, however, have treated “code as law” as an accomplishment complete in itself, giving them permission to avoid thinking rigorously about the social and technical dynamics of computers, software, and networks. Our goal in this review is to keep the same thing from happening to *The Future of the Internet*. We draw out the line connecting Lessig to Zittrain in the hope that many more will take up architecturalism's banner in the years to come.