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A Portrait of the Internet as a Young Man

Ann Bartow
University of New Hampshire School of Law, ann.bartow@law.unh.edu

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THE FUTURE OF THE INTERNET—AND HOW TO STOP IT. By *Jonathan Zittrain*. New Haven and London: Yale University Press. 2008. Pp. x, 342. Cloth, $30; paper, $17.

INTRODUCTION

In brief, the core theory of Jonathan Zittrain's[1] 2008 book *The Future of the Internet—And How to Stop It* is this: good laws, norms, and code are needed to regulate the Internet, to prevent bad laws, norms, and code from compromising its creative capabilities and fettering its fecund flexibility. A far snarkier if less alliterative summary would be "We have to regulate the Internet to preserve its open, unregulated nature."

Zittrain posits that either a substantive series of unfortunate Internet events or one catastrophic one will motivate governments to try to regulate cyberspace in a way that promotes maximum stability, which will inhibit or possibly even preclude future technological innovations that rely on open access to the tools and systems that comprise the Internet.[2] To head this off, he calls for a "transition to a networking infrastructure that is more secure yet roughly as dynamic as the current one," which will be achieved by collaborative efforts, "a 21st century international Manhattan Project which brings together people of good faith in government, academia, and the private sector for the purpose of shoring up the miraculous information technology grid that is too easy to take for granted and whose seeming self-maintenance has led us into an undue complacence."[3]

Zittrain uses brief, informal accounts of past events to build two main theories that dominate the book. First, he claims that open access, which he calls generativity, is under threat by a trend toward closure, which he refers to as tetheredness, which is counterproductively favored by proprietary entities. Though consumers prefer openness and the autonomy it confers, few

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* Professor of Law, University of South Carolina School of Law. The author dedicates this Review to her son Casey, and to the memory of C. Edwin Baker, and thanks the *Michigan Law Review* for publishing it. She also thanks Jonathan Zittrain for writing such a thoughtful and interesting book.

1. Professor of Law, Harvard Law School.

2. P. 51 ("When will we know that something truly has to give? There are at least two possible models for a fundamental shift in our tolerance of the status quo: a collective watershed security moment, or a more glacial death of a thousand cuts. Both are equally threatening to the generativity of the Internet.").

3. Jonathan Zittrain, *Without a Net*, LEGAL AFF., Jan./Feb. 2006, at 32, 38, *available at* http://www.legalaffairs.org/issues/January-February-2006/feature_zittrain_janfeb06.msp.

take advantage of the opportunities it provides, and therefore undervalue it and too readily cede it in favor of the promise of security that tetheredness brings. Second, he argues that if the Internet is to find salvation it will be by the grace of "true netizens," volunteers acting collectively in good faith to cultivate positive social norms online.

Zittrain is a creative thinker and entertaining speaker,[4] and his book is engaging and informative in much the same ways that his talks are, loaded with pop culture references and allegorical tales about technology and the once and future Internet. Zittrain uses numerous anecdotes to support his dual hypotheses, exhaustively affirming that open innovative tools and systems are essential for online life to flourish, and his contention that the Internet is exceedingly vulnerable to bad actors (a proposition I have never seen another cyberlaw scholar seriously question[5]). But he isn't very clear about the specific attributes of laws or regulations that could effectively foster enhanced security without impairing dynamism. He also seems to have a discomfitingly elitist view about who should be making policy decisions about the Internet's future: likeminded, self-appointed, and knowledgeable volunteers with the time, interest, and expertise to successfully maneuver sectors of the Internet into the form or direction he thinks best.

Now, let me explain the title of the review essay. One of the themes of the James Joyce novel first published in 1916, *A Portrait of the Artist as a Young Man,*[6] is the Irish quest for autonomous rule.[7] Jonathan Zittrain's *The*

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4. *See, e.g.*, *The Colbert Report* (Comedy Central television broadcast June 17, 2008), *available at* http://www.colbertnation.com/the-colbert-report-videos/174083/june-17-2008/jonathan-zittrain.

5. *See, e.g.*, Tim Wu, *The New New Media*, NEW REPUBLIC, Dec. 31, 2008, at 45 (reviewing *The Future of the Internet—And How to Stop It*). Tim Wu writes:

> But I must part company with Zittrain over his main and more somber argument: that security crises will form the driving narrative of the Internet's future. I do not doubt that there will be never-ending security problems and reactions. But the question is not whether cybersecurity will matter, but whether it will matter most. Zittrain's security saga does not look to me like a full account of the future. He is leaving out many of the external forces that will change the Internet. One is the power of government, which, especially overseas, has begun reshaping the network to fit its obsessions. Another is the combined forces of language and culture, which are driving a once-global Internet into something more like a series of national ones: a Japanese Internet, a Spanish Internet, and so on.
>
> But most important, the real story may lie in the power of industry structure and the long trend toward centralized control in the media industries. Over the last decade, the Internet has become interwoven with media and communications industries collectively worth trillions, with economics all of their own. Unlike Zittrain, I think that industry dynamics, more than a demand for safe appliances, will determine the future of this strange and extraordinary medium.

Id. at 45. Larry Lessig labeled a blog post about a destructive computer worm "from the Zittrain-told-us-so department," Lessig 2.0, http://www.lessig.org/blog/2009/01/from_the_zittrain-told-us-so_d.html (Jan. 25, 2009, 11:31 PST), but I have a hard time believing that Lessig had never heard of worms or viruses before he read Zittrain's book.

6. JAMES JOYCE, A PORTRAIT OF THE ARTIST AS A YOUNG MAN (1916).

7. *See* JAMES FAIRHALL, JAMES JOYCE AND THE QUESTION OF HISTORY (1993); *see also* Joshua D. Esty, *Excremental Postcolonialism*, 40 CONTEMP. LITERATURE 22 (1999). As Esty explains:

Future of the Internet—And How to Stop It is similarly infused with the author's desire for principled, legitimate governance, only of the place called cyberspace, rather than the author's meet space homeland.

Portrait's protagonist, Stephen Dedalus, internally defines himself as an artist through a nonlinear process of experiences and epiphanies. He consciously decides that it should be his mission to provide a voice for his family, friends, and community through his writing. Though Dedalus opts out of the traditional forms of participation in society, he envisions his writing as a way to productively influence society. Jonathan Zittrain charts the development of the Internet as a nonlinear process wrought by both conscious hard work and sweeping serendipity. He also strives to provide a voice for technologically elite Internet users, and to influence the development of online culture. He paints a portrait of the future Internet as chock full of so many enigmas and puzzles that it will keep the cyberlaw professors busy for decades, even though according to Zittrain, law as it is traditionally conceptualized will not be important.

I additionally chose the title for its decisive invocation of maleness. Embedded within Zittrain's theories of generativity, there is also a perplexing gender story, in which men are fertile, crediting themselves with helping to "birth" the field of cyberlaw,[8] and engaging in stereotypically domestic pursuits such as "baking" restrictions into gadgetry.[9] Nongenerative appliances are deemed "sterile"[10] by Zittrain, sterility being the conceptual opposite of

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> To take a final instance of this kind of writing, I want briefly to consider Joyce's *Portrait of the Artist as a Young Man*, which famously narrates a struggle to disengage from the norms of nation, language, and religion. In the novel, shit surfaces at the pressure points of engagement. For example, Stephen Dedalus's heart is sickened by the excremental world of the market, figured in the Stradbrook cow yard, "with its foul green puddles and clots of liquid dung[.]" Later, Stephen's Jesuit-inspired vision of hell features a harrowing profusion of shit. Stephen defines his developing self in successive moments of recoil from public, excremental filth. He flies the nets of social affiliation in an exquisite (if callow) attempt to forge an autonomous self and a freestanding personal aesthetic. From this perspective, Stephen's desire to awake from the nightmare of history might serve as a slogan for the postcolonial subject—or artist—wishing to resist the imperatives of new nationalism.

Id. at 51(quoting JAMES JOYCE, A PORTRAIT OF THE ARTIST AS A YOUNG MAN 63 (Penguin Books 1964) (1916))) (citation omitted).

8. Posting of Lawrence Lessig to Amazon.com, Customer Reviews: The Future of the Internet—And How to Stop It, *Cyberlaw 2.0*, http://www.amazon.com/review/R131R71HS3YJVG/ref=cm_cr_rdp_perm (Dec. 4, 2008) ("The field of cyberlaw, or the law of the Internet—a field I helped birth . . . has suffered because people like me have spent too much time cheerleading, and not enough time focusing the world on the real problems and threats that the Internet has produced."); *see also* Daniel J. Solove, *Privacy and Power: Computer Databases and Metaphors for Information Privacy*, 53 STAN. L. REV. 1393, 1416–17 (2001) (noting that Roger Clarke is credited with coining the term "dataveillance"). Roger Clarke published suggestions for internet regulations as early as 1988. *See* Roger A. Clarke, *Information Technology and Dataveillance*, 31 COMM. ACM 498, 508–11 (1988).

9. P. 3 ("Jobs was not shy about these restrictions baked into the iPhone.").

10. P. 2 ("The iPhone is the opposite. It is sterile."); p. 3 ("The future is not one of generative PCs attached to a generative network. It is instead one of sterile *appliances* tethered to a network of control."); p. 18 ("To understand the options that follow, it helps to see the sterile, non-generative alternatives to the generative system."); p. 41 ("Thus, the networks evolved slowly and with few surprises either good or bad. This made them both secure and sterile in comparison to generative machines hooked up to a generative network like the Internet."); p. 63 ("This part of the book offers

generativity. His deployment of reproductive imagery is odd. A metaphor evoking an author's creative output as a child the author has brought into the world is often invoked in the context of copyright law by people arguing that authors should have extensive control over the works they create.[11] Zittrain's variation characterizes controlled technological innovations as unable to produce progeny at all. The metaphor works better if tetheredness is instead envisaged as a form of birth control, preventing unwanted offspring only. Certainly the producers of closed devices or locked software are able and generally enthusiastic about providing new and improved versions of their goods and services to paying customers.

My initial idea for the title was *Is the Future of Cyberspace a Woman?*[12] In 2009, Jeannie Suk published an essay entitled *Is Privacy a Woman?*, which tracked the various gendered tropes that have been invoked by the Supreme Court when privacy is theorized: the lady of the house in the bath; the lady at home receiving callers; and battered women.[13] A host of gendered tropes surface when lawyers theorize the Internet as well. But I rejected that title because it also problematically suggests that women might be significantly involved in the cyberlaw-rooted future of the Internet, which seems unlikely given its current Boys Club climate, or in *The Future of the Internet—And How to Stop It*, within the pages of which proportionately very few women are cited.[14] The most visible milieux for women on the Internet are in the contexts of commoditized sex, both pornography and prostitution, and as objects of sexualized commentary and derision. The bleak future the Internet holds for women if this continues unabated is not something the

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an analytic definition of generativity and describes its benefits and drawbacks. It then explores the implications of a technological ecosystem in which non-generative devices and services—sterile "tethered appliances"—come to dominate."); p. 64 ("These problems can pose a lethal threat to generative systems by causing people to transform them into, or abandon them for, sterile alternatives."); p. 73 ("Generative tools are not inherently better than their non-generative ('sterile') counterparts."); p. 149 ("The response to the failure will most likely be sterile tethered appliances and Web services that are contingently generative, if generative at all."); p. 182 ("A model that begins as sterile is much harder to open meaningfully to third-party contribution than one that is generative from the start."); p. 196 ("The danger of a trump is greater for a sterile system, where a user must accept the system as it is if he or she is to use it at all, than for the tools developed for a generative one, where there is a constant—perhaps healthy—back-and-forth between tools to circumvent regulation and tools to effect the regulation anyway."); p. 201 ("The report pinpointed troubles arising not simply from powerful computing technology that could be used both for good and ill, but also from its impersonal quality: the sterile computer processed one's warm, three-dimensional life into data handled and maintained by faraway faceless institutions, viewed at will by strangers.").

11. *See* Malla Pollack, *Towards a Feminist Theory of the Public Domain, or Rejecting the Gendered Scope of the United States Copyrightable and Patentable Subject Matter*, 12 WM. & MARY J. WOMEN & L. 603, 606–07 (2006); The Patry Copyright Blog, *Gender and Copyright*, http://williampatry.blogspot.com/2008/06/gender-and-copyright.html (June 20, 2008, 10:29 EST).

12. *Cf.* Jeannie Suk, *Is Privacy a Woman?*, 97 GEO. L.J. 485 (2009).

13. *See id.*

14. For a rare instance of a citation to a woman in Zittrain's book, see, for example, p. 324 n.138 (citing Posting of Ann Bartow to Feminist Law Professors, *Well, Those "ReputationDefender" Guys Certainly Are Well-Connected, Anyway*, http://feministlawprofs.law.sc.edu/?p=1671 (Apr. 8, 2007, 17:47 EST)).

book considers.[15] Nor does Zittrain meaningfully comment on the persistent underrepresentation of women in the computer science and related information technology ("IT") fields.[16]

Zittrain offers a well-executed collection of stories that are intended to anchor his global theories about how the Internet should optimally function, and how two classes of Internet users should behave: the technologies should be generative, but also monitored to ensure that generativity is not abused by either the government or by scoundrels; elite Internet users with mad programming skilz[17] should be the supervisors of the Internet, scrutinizing new technological developments and establishing and modeling productive social norms online; and average, non–technically proficient Internet users should follow these norms, and should not demand security measures that unduly burden generativity.

The anecdotes are entertaining and educational, but they do not constructively cohere into an instruction manual on how to avoid a bad future for people whose interests may not be recognized or addressed by what is likely to be a very homogeneous group of elites manning (and I do mean manning) the virtual battlements they voluntarily design to defend against online forces of evil. And some of the conclusions Zittrain draws from his stories are questionable. So, I question them below.

I. GENERATIVITY VERSUS TETHEREDNESS IS A FALSE BINARY

Pitting generativity against tetheredness creates a false binary that drives a lot of Zittrain's theorizing. The book was published in May of 2008, but its origins can be found in his earlier legal scholarship and mainstream media writings. In 2006 Jonathan Zittrain published an article entitled *The Generative Internet*.[18] In it, he asserted the following:

> Cyberlaw's challenge ought to be to find ways of regulating—though not necessarily through direct state action—which code can and cannot be readily disseminated and run upon the generative grid of Internet and PCs,

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15. Yochai Benkler, whom Zittrain extensively cites, similarly ignores pornography in his book. *See* Ann Bartow, *Some Peer-to-Peer, Democratically, and Voluntarily-Produced Thoughts*, 5 J. TELECOMMS. & HIGH TECH. L. 449, 456–57 (2007) (reviewing YOCHAI BENKLER, THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM (2006)).

16. *See, e.g.*, SYLVIA ANN HEWLETT, THE ATHENA FACTOR: REVERSING THE BRAIN DRAIN IN SCIENCE, ENGINEERING, AND TECHNOLOGY (2008); PANEL FOR THE STUDY OF GENDER DIFFERENCES IN THE CAREER OUTCOMES OF SCI. AND ENG'G PH.D.S, NAT'L RESEARCH COUNCIL, FROM SCARCITY TO VISIBILITY: GENDER DIFFERENCES IN THE CAREERS OF DOCTORAL SCIENTISTS AND ENGINEERS (2001); Sharon Gaudin, *The critical shortage of women in IT*, NETWORK WORLD, Nov. 22, 1999, at 53; Randall Stross, *What Has Driven Women Out of Computer Science?*, N.Y. TIMES, Nov. 16, 2008, at B4; Caroline Wardle et al., *The Increasing Scarcity of Women in Information Technology Is a Social Justice Issue*, ETHICOMP J., 2004.

17. *See* Urban Dictionary, Skilz, http://www.urbandictionary.com/define.php?term=+Skilz (last visited Sept. 24, 2009) (second definition).

18. Jonathan L. Zittrain, *The Generative Internet*, 119 HARV. L. REV. 1974 (2006) [hereinafter Zittrain, *The Generative Internet*].

> lest consumer sentiment and preexisting regulatory pressures prematurely and tragically terminate the grand experiment that is the Internet today.[19]

Like the article, the book is useful for provoking thought and discussion, and it teaches the reader a lot of disparate facts about the evolution of a number of different technologies. But it does not provide much direction for activists, especially not those who favor using laws to promote order. Zittrain has come to bury cyberspace law as promulgated by governments, not to praise it. "Cyberlaw" as redefined by Zittrain is no longer the science of adapting existing real-space legal constructs to the online environment. Instead it is a collection of best practices chosen by people with the technological proficiency to impose them, top down, on the ignorant folks who are selfishly driven by their shallow consumer sentiments.

An abstract for the book, featured at its dedicated web page, states:

> The Internet's current trajectory is one of lost opportunity. Its salvation, Zittrain argues, lies in the hands of its millions of users. Drawing on generative technologies like Wikipedia that have so far survived their own successes, this book shows how to develop new technologies and social structures that allow users to work creatively and collaboratively, participate in solutions, and become true "netizens."[20]

I will bluntly state (splitting an infinitive in the process) that I did not learn how to develop new technologies or new social structures from reading this book. It convinced me that new technologies and new social structures could contribute productively to the Internet if they develop appropriately, but Zittrain does not provide road maps or an instruction manual for developing them. He calls for "[c]ivic technologies [that] seek to integrate a respect for individual freedom and action with the power of cooperation,"[21] but doesn't paint a clear picture of which precise qualities these technologies or social structures would have, beyond cultivating generativity.

Zittrain relentlessly informs the reader that generativity is a very good thing, except when it is abused by malefactors. But what, exactly, is generativity? The primary purpose of the book's introduction is to introduce the word "generative" to readers unfamiliar with his previous work, and it is used eight times in the span of four-and-a-half pages. The first two times it appears in the text, "generative" is also conveniently italicized (p. 2), so that the reader will recognize its remarkable importance. Zittrain invokes the terms generative, nongenerative, and generativity constantly throughout the book (over 500 times), but the definition of generative

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19. *Id.* at 1979.

20. *The Future of the Internet—And How to Stop It* Homepage, http://futureoftheinternet.org/ (last visited July 27, 2009).

21. Posting of Jonathan Zittrain to Cato Unbound, *How to Get What We All Want*, http://www.cato-unbound.org/2009/05/06/jonathan-zittrain/how-to-get-what-we-all-want/ (May 6, 2009, 07:59 EST).

doesn't remain constant. Sometimes it means creative or innovative, while other times it connotes openness, accessibility, or freedom.[22]

Zittrain had written previously that "Generativity denotes a technology's overall capacity to produce unprompted change driven by large, varied, and uncoordinated audiences."[23] Similarly, in the book he says, "*Generativity is a system's capacity to produce unanticipated change through unfiltered contributions from broad and varied audiences*" (p. 70; emphasis in original). He lists five elements of generativity:

> (1) how extensively a system or technology leverages a set of possible tasks; (2) how well it can be adapted to a range of tasks; (3) how easily new contributors can master it; (4) how accessible it is to those ready and able to build on it; and (5) how transferable any changes are to others—including (and perhaps especially) nonexperts. (p. 71)

Zittrain tells us that generativity is a very good thing, except when it isn't. It is framed as the opposite of baked, and tethered (which Zittrain uses over seventy times), and the spell-check–taunting and awkward-to-pronounce "appliancization" (which appears fifteen times).

Generative also seems to mean idiot resistant. In his article *The Generative Internet* he explains that PCs are highly adaptable machines that are connected to a network with little centralized control, resulting in "a grid that is nearly completely open to the creation and rapid distribution of the innovations of technology-savvy users to a mass audience that can enjoy those innovations without having to know how they work."[24] In the book, he makes the same point repeatedly—that most "mainstream" or "rank-and-file" computer users are either passive beneficiaries or victims of generativity, rather than generative actors.[25] There is a highly influential generative class of individuals who use generativity in socially productive ways. There is a nefarious group of reprobates who abuse generativity to create online havoc. And then there are the rest of the people online, sending and receiving emails, reading and writing blogs, participating on social-networking sites, renewing antivirus subscriptions, banking, shopping, and reading newspapers online. These users are blithely unaware of the generativity that provided this vast electronic bounty and complacently believe that as long as they continue to pay an Internet service provider ("ISP") for Internet access, its delivery will remain relatively smooth and

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22. *Compare* p. 84 ("Generative systems allow users at large to try their hands at implementing and distributing new uses, and to fill a crucial gap when innovation is undertaken only in a profit-making model . . . ."), *with* p. 113 ("[T]he PC telephone program Skype is not amenable to third-party changes and is tethered to Skype for its updates. Skype's distribution partner in China has agreed to censor words like 'Falun Gong' and 'Dalai Lama' in its text messaging for the Chinese version of the program. Other services that are not generative at the technical layer have been similarly modified . . . .").

23. Zittrain, *The Generative Internet*, *supra* note 18, at 1980.

24. *Id.*

25. *See, e.g.*, p. 3; *see also* pp. 4, 8, 43, 44–45, 51, 56, 59, 78, 100, 102, 130, 151–52, 155, 159–60, 198, 243, 245.

uninterrupted. When they call for more security for electronic devices, they are the damage that generativity has to route around.[26]

The antigenerative concept of tetheredness also does some definitional shape-shifting throughout the tome. Sometimes it means unmodifiable, while other times it means controlled by proprietary entities, who may or may not facilitate, or even tolerate, alterations of their wares by end users. According to Zittrain, the dangers of tethers are twofold: private companies can regulate how consumers use their products, and services and governments can use them to censor or spy on their citizens.[27]

Oddly, Wikipedia, with which Zittrain appears quite infatuated, defines "tethering" in a technological sense very differently than Zittrain does; or at least it does while I am writing this. Given the malleability of Wikipedia entries, that could certainly change in the next ten minutes.[28] In any event, the definition featured by the "tethering" Wikipedia entry is as follows: "Tethering is using some type of mobile device to gain Internet access on another device. Tethering works by connecting a device that can access the Internet, to another device that cannot."[29] This actually sounds like a useful undertaking, and potentially even a generative one.

Tethers can be good things if you are a mountain climber, or if you don't want your horse to run off without you. And far more pertinently, tethers facilitate software updating for flaw-fixing and hole-patching purposes. Untethered software would require manual updates, a labor-intensive prospect that would require a degree of programming proficiency that a lot of Internet users may lack. How many people are prepared to give up the advantages of tetheredness in the interest of preserving generativity is unclear. Without tethered appliances the functionality of the Internet will be compromised. Try using a program that is no longer updated or supported by its vendor. Its obsolescence may render it untethered, but unless you have some pretty good programming chops, its usefulness will decline rapidly. Zittrain fears people will exchange generativity for security in binary fashion, but the relationship between tetheredness and convenience needs to be taken into account, as these variables will also affect consumer preferences and behav-

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26. This is a sideways reference to the John Gilmore quote, "The Net interprets censorship as damage and routes around it." *See* Philip Elmer-DeWitt, *First Nation in Cyberspace*, TIME, Dec. 6, 1993, at 62, 64, *available at* http://www.time.com/time/magazine/article/0,9171,979768,00.html.

27. *See, e.g.*, pp. 56–57, 113 (discussing Skype); pp. 109–10, 113 (discussing OnStar); p. 113 (discussing China's use of Google.cn); pp. 210–14 (discussing mobile phones).

28. *See, e.g.*, DILBERT, May 8, 2009.

29. Wikipedia, Tethering, http://en.wikipedia.org/wiki/Tethering (last visited July 24, 2009).

iors. The fundamental security most people seek is probably operability. Any threat to serviceability, whether from too much generativity or too many tethers, will provoke a call for action from users.

I couldn't have accessed the downloadable version of Zittrain's book without a host of tethered utilities, including my computer's operating system, my Internet browser, and Adobe Acrobat, which all update automatically with great frequency, as I consented to allow them to do when I agreed to the terms of use laid out in the associative end user license agreements ("EULAs"). The same with my printer software, my antivirus program, my online media players, the online games I play, and every other Internet-related utility I use. In a sense this proves Zittrain's assertion that we have ceded control over the mechanisms of online interface to electronic leash-wielding tyrants. But, he may have the timing as well as motivation wrong. I suspect most of us deferred to tethering commercial enterprises very early in the evolution of the mainstream Internet, rather than recently. Zittrain references pioneering ISPs CompuServe and AOL as proprietary services that were overwhelmed by the generativity of PCs and the Internet.[30] My initial nonacademic experiences with the Internet comprised waiting anxiously for CompuServe and then AOL to finish installing updates when I needed to check my e-mail, and I had to pay for my Internet time by the minute. Things only went downhill when AOL went to an "all you can eat" payment structure, providing unlimited Internet for a fixed monthly fee. Users surged but AOL's capacity could not meet the demand.[31] Writer Ann Lamott captured the era nicely:

> God, I hate AOL. AOL is the bane of my existence. It came already installed on the computer I bought last year, and someone talked me into signing on with them so I could get e-mail. But right away, it started driving me crazy, because it took forever to sign on and get the artwork to stop arriving. Even when I'd get on a little roll and sign on successfully, a window would open and more artwork would start flooding on. RECEIVING ITEM 1 of 2, it would announce. And I'd sit there trying to be patient, maybe drumming my fingers just a tiny bit, maybe I have the tiniest tiniest [sic] problem with control, HARDLY WORTH MENTIONING; and then page 2 of 2 would flood slowly on, a little like those old nudie pens where the woman's bikini floods off and on. And I'd think I was about to hear the little valet trapped inside my computer, whom I call Phil, announce, "Welcome! You have mail." Or even just "Welcome!" which is okay even

30. The PC revolution was launched with PCs that invited innovation by others. So too with the Internet. Both were generative: they were designed to accept any contribution that followed a basic set of rules (either coded for a particular operating system, or respecting the protocols of the internet). Both overwhelmed their respective proprietary, nongenerative competitors, such as the makers of stand-alone word processors and proprietary online services like CompuServe and AOL. Pp. 23–25.

31. Timothy C. Barmann, *Judge to rule this week on AOL service*, CYBERTALK, Oct. 26, 1997, http://www.cybertalk.com/102697b.htm; Janet Kornblum, *AOL outage brief but dangerous*, CNET NEWS, Feb. 24, 1998, http://news.cnet.com/2100-1023-208445.html&tag=mncol%3btxt; Courtney Macavinta, *State bill punishes ISP outages*, CNET NEWS, Mar. 2, 1998, http://news.cnet.com/State-bill-punishes-ISP-outages/2100-1033_3-208622.html.

> though I always imagine Phil feeling badly about the lack of mail; and maybe having a little co-dependent slip.
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> Furthermore, there wasn't even a way to get on the Web with the system that came with the computer. I could send and receive e-mail, and check the main news stories every day. But I'd click on the news icon, feeling very cocky—like me and Bill Gates, just clicking away on our little icons—but then another artwork window would open, and more artwork would begin flooding in. RECEIVING ITEM 1 of 2, it would announce as the little bar graph began darkening, and I have to say, it would download at a snail's pace.[32]

Lamott didn't want security. She wanted performance. Tetheredness, or something similar, may have been linked to AOL's difficulties meeting its customers' demand, but overselling and insufficient server capacity were the true culprits in terms of inhibiting operability. In addition, if Zittrain is correct that CompuServe and AOL exemplify the evils of tethering, it's pretty clear the market punished those entities pretty harshly without Internet-governance-style interventions.

Software and electronic devices can be simultaneously generative and tethered. And it is unfair to criticize people who quite reasonably rely on tetheredness to keep their computers and electronic equipment updated and fully functional. Many average Internet users might like more transparency about the nature and extent of the tethers that connect their computers to large multinational corporations, but short of having actual laws that require relevant disclosures, this consumer desire is unlikely to be met. For them, generativity is unlikely to be helpful or enlightening, as Zittrain correctly notes, because they are not skilled enough to take advantage of it. In the absence of helpful laws, they must rely on an elite, volunteer Geek Corps to enlighten and guide them.

II. GENERATIVITY: THE GOOD, THE BAD, AND THE FUGLY

Zittrain tells a lot of stories intended to show that generative technologies are better than tethered ones. But another strand of his narrative illustrates that generativity can be used destructively, to support the contention that it cannot be unfettered. At its worst, he warns, generativity will enable bad actors to exploit tethers for nefarious purposes, while tethers will simultaneously restrain positive generative responses to these challenges. His accounts of degenerate generativity rest uneasily with his exhortation that facilitating generativity should be the guiding principle of Internet governance.

He also suggests deploying the "generative principle to determine whether and when it makes sense to violate the end-to-end principle" in the context of debates about network neutrality (p. 185). And the quantum of generativity that is promoted becomes the measure for assessing the

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32. Anne Lamott, Op-Ed., *aol: Agent of Lucifer*, SALON, Aug. 5, 1996, http://www.salon.com/weekly/lamott960805.html.

legitimacy and effectiveness of what he characterizes as the intrusions of cyberlaw. He writes:

> The touchstone for judging such efforts should be according to the generative principle: do the solutions encourage a system of experimentation? Are the users of the system able, so far as they are interested, to find out how the resources they control—such as a PC—are participating in the environment? (p. 173)

Fostering generativity thus becomes the Prime Directive of Internet governance.[33]

But there are problems he raises elsewhere in the book that generativity may not address, or may in fact exacerbate. For example, Zittrain references OnStar a number of times, warning that it can be used by law enforcement for surveillance purposes because it is tethered, and can be accessed remotely.[34] Putting aside questions about whether OnStar is accurately described as part of the Internet, one wonders of what practical use OnStar would be to its clients if it wasn't tethered. OnStar seems to be a service that caters to people who want higher levels of proactive information and security when they are driving than the combination of a GPS unit and mobile phone can provide. OnStar customers don't want generativity; they want someone to call the police and an ambulance or tow truck if they have an accident so they don't have to, or to track down the location of their vehicle if it is stolen. Security means more to them than privacy, and if they don't consciously realize they are exchanging one for the other when they sign up with OnStar, it seems to me the best solution is to require OnStar to inform them of this in simple and unambiguous terms. Providing further information, perhaps including a primer on the search and seizure jurisprudence of Fourth Amendment law, could also be required of OnStar by law. Making OnStar generative, so that private citizens can readily discern incursions by government actors, would not give OnStar customers any more of what they appear to want, which is a high level of security overtly linked to constant, dedicated supervision. Enhanced generativity might also provide opportunities for private spying or intentional service disruptions by the villains Zittrain spills a lot of ink warning against.

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33. "The Prime Directive is a plot device cooked up by a patently optimistic TV writer (either *Trek* producer Gene L. Coon or writer Theodore Sturgeon, depending on who you ask) in the mid-1960s. It's a freshmen-year philosophy student's reaction to the Cold War, when America and the Soviets were playing out their hostilities by proxy third-world conflicts. Effectively, they were interfering in the 'development' of underprivileged countries to further their own ends with some awful immediate and long-term results. In Roddenberry's vision, humanity had evolved beyond such puppeteering and become an 'advanced' race." Posting of Jay Garmon to Geekend, *Why 'Star Trek's Prime Directive is stupid'*, TECHREPUBLIC.COM, http://blogs.techrepublic.com.com/geekend/?p=533 (Feb. 12, 2007); *see also* Posting of George Dvorsky to Sentient Developments, *Star Trek's 'Prime Directive' is stupid*, http://www.sentientdevelopments.com/2007/01/star-treks-prime-directive-is-stupid_13.html (Jan. 13, 2007).

34. Pp. 109–10, 113, 117–18, 187.

Many of his examples of useful online-governance initiatives rely on extensive amounts of volunteer labor. But the important technological innovations related to the Internet were motivated by some form of self-interest. The U.S. Defense Department developed the Internet as a decentralized communications system that would be difficult to disrupt during wartime.[35] Tim Berners-Lee invented the World Wide Web as a way to facilitate communications with other physicists.[36] Pornographers have long used spam, browser hijacking, and search-engine manipulation to reach the eyeballs of potential customers.[37] All may have relied on generativity (though one might question how open and accessible the Defense Department was) but not all are socially beneficial.[38]

Sometimes Internet users may donate their labor involuntarily. Their online activities are harvested and bundled into what Zittrain applauds as the mediated wisdom of the masses. For example, he notes as follows:

> The value of aggregating data from individual sources is well known. Yochai Benkler approvingly cites Google Pagerank algorithms over search engines whose results are auctioned, because Google draws on the individual linking decisions of millions of Web sites to calculate how to rank its search results. If more people are linking to a Web site criticizing Barbie dolls than to one selling them, the critical site will, all else equal, appear higher in the rankings when a user searches for "Barbie." (p. 160; footnote omitted)

But all else is unlikely to be equal. Mattel can hire reputation-defense companies like ReputationDefender[39] to bury the critical sites about Barbie using search engine-optimization techniques and to surreptitiously edit

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35. *See* Joseph D. Schleimer, *Protecting Copyrights at the "Backbone" Level of the Internet*, 15 UCLA ENT. L. REV. 139, 149 (2008); *see also* JANET ABBATE, INVENTING THE INTERNET 7–41 (1999).

36. ABBATE, *supra* note 35, at 214; *see also* Dick Kaser, *The Guy Who Did the WWW Thing at the Place Where He Did It*, INFO. TODAY, Feb. 2004, at 30.

37. *See e.g.*, Filterguide.com, Pornographers Can Fool You With Hi-Tech, http://www.filterguide.com/pornsfool.htm (setting forth various ways in which pornographers use technology to fool children) (last visited Oct 21, 2009); PEW INTERNET & AMERICAN LIFE PROJECT, SPAM IS STARTING TO HURT EMAIL (2003), http://www.pewinternet.org/Press-Releases/2003/Spam-is-starting-to-hurt-email.aspx (accounting for pornography-related spams' impact on email); Stuart Miller, *Pornographers Hijack Home Computers*, THE GUARDIAN, June 13, 2003, http://www.guardian.co.uk/technology/2003/jun/13/newmedia.media1 (discussing pornography spammers' ploy to use email virus); Yes Dear, There is a Porn SEO, and We Can Learn a Lot From It, http://www.seomoz.org/ugc/yes-dear-there-is-porn-seo-and-we-can-learn-a-lot-from-it (Jan. 21, 2008, 15:48) (recounting marketing techniques used by pornographers).

38. *See generally* Ann Bartow, *Pornography, Coercion, and Copyright Law 2.0*, 10 VAND. J. ENT. & TECH. L. 799, 800 (2008) ("Pornography is a dominant industrial force that has driven the evolution of the Internet.").

39. P. 230 (asserting that ReputationDefender uses "moral suasion" as its primary technique for manipulating search-engine results). I offer a very different perspective on this. *See* Ann Bartow, *Internet Defamation as Profit Center: The Monetization of Online Harassment*, 32 HARV. J.L. & GENDER 383 (2009).

Wikipedia entries.[40] For-profit entities don't just want to spy on and control their customers with tethers. They also want to manipulate as much of the Internet as possible to their benefit, and this logically includes taking steps to highlight positive information and minimize the visibility of disparagement by third parties.

Additionally, collective actions by the online masses can be oppressive. If more people link to websites glorifying sexual violence against women than to websites where women are treated as if they are fully human, those sites appear higher in the rankings when a user searches for a wide variety of things related to sex. The same is potentially true for racist and homophobic sites and other content that depict discrete groups in derogatory ways. In this way, negative stereotypes can be reinforced and spread virally.[41]

Finally, in the Google Pagerank example, the power and input of the masses is being harnessed, for profit, by a large corporation. Google is doubtlessly happy to use generative tools when they are effective. But contrast the Google search engine with Google's Gmail,[42] and it becomes apparent that the same company will keep a service tethered and proprietary when doing so best suits its purposes.

And then there is the idiosyncratic online juggernaut that is Wikipedia, to which Zittrain devotes virtually an entire chapter (Chapter Six). Wikipedia is an online encyclopedia that, at least in theory, anyone can edit. Zittrain is clearly enamored of it, writing,"Wikipedia stands at the apex of amateur endeavor: an undertaking done out of sheer interest in or love of a topic, built on collaborative software that enables a breathtakingly comprehensive result that is the sum of individual contributions, and one that is extraordinarily trusting of them" (p. 96). Zittrain provides a lot of information about Wikipedia, and the vast majority of it skews positive. He writes, "Wikipedia has charted a path from crazy idea to stunning worldwide success" (p. 136); and "Wikipedia is the canonical bee that flies despite scientists' skepticism that the aerodynamics add up" (p. 148); and asserts that the manner in which Wikipedia operates "is the essence of

40. Zittrain himself noted something similar, writing, "If the Wikipedia entry on Wal-Mart is one of the first hits in a search for the store, it will be important to Wal-Mart to make sure the entry is fair—or even more than fair, omitting true and relevant facts that nonetheless reflect poorly on the company." P. 139.

41. Zittrain tacitly acknowledges this: "There are plenty of online services whose choices can affect our lives. For example, Google's choices about how to rank and calculate its search results can determine which ideas have prominence and which do not" (p. 147).

42. *See generally* Paul Boutin, *Read My Mail, Please*, SLATE, Apr. 15, 2004, http://slate.msn.com/id/2098946; Posting of Deane to Gadgetopia, *Critics Release the Hounds on GMail*, http://gadgetopia.com/post/2254 (Apr. 10, 2004, 10:09AM); Google Watch, http://www.google-watch.org/gmail.html; Brian Morrissey, *An Early Look at How Gmail Works*, DMNEWS, Apr. 19, 2004, http://www.dmnews.com/an-early-look-at-how-gmail-works/article/83946.

law" (p. 144). Perhaps echoing Zittrain's enthusiasm, one researcher determined Wikipedia has been cited in over 400 U.S. court opinions.[43]

Among myriad other facts and anecdotes, Zittrain notes that Wikipedia co-founder Larry Sanger is controversial because possibly he is given too much credit for his limited contributions to Wikipedia.[44] He also notes that another person involved with Wikipedia, former Wikimedia Foundation member Angela Beesley Starling, unsuccessfully fought to have her Wikipedia entry deleted (p. 143). That a man who wants undeserved credit and a woman who wants no attention at all have likely both been thwarted by Wikipedians is something Zittrain seems to view as a positive indicator. Angela Beesley Starling probably feels very differently, especially if her reasons for wanting her Wikipedia entry deleted included pressing personal safety concerns. The "talk" page of her Wikipedia biography quotes her as saying, "I'm sick of this article being trolled. It's full of lies and nonsense."[45] The forced publicity of Wikipedia entries is something all women may encounter under Wikipedia's "system of self-governance that has many indicia of the rule of law without heavy reliance on outside authority or boundary" (p. 143). Research suggests that women, though 51 percent of the population, comprise a mere 13 percent of Wikipedia contributors,[46] for reasons that probably have to do with the culture of this entity, which women may experience more negatively than men do.

Certainly notable living feminists have been on the receiving end of a campaign of nasty and untruthful edits to Wikipedia entries they would probably prefer not to have. Many entries on feminism have been written or edited by people who are actively hostile toward feminists, but they prevail because they seem to have a lot of free time and the few feminists who enter the wikifray seem to get driven out or edited into oblivion. To take just one example, the entries about Melissa Farley,[47] Catharine

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43. Lee F. Peoples, *The Citation of Wikipedia in Judicial Opinions*, 12 YALE J.L. & TECH. (forthcoming 2009), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1272437.

44. P. 143 ("At times—they are constantly in flux—Wikipedia's articles about Wikipedia note that there is controversy over the 'co-founder' label for Sanger."); *see also* pp. 142, 145.

45. Wikipedia, Angela Beesley Starling Talkpage, http://en.wikipedia.org/wiki/Talk:Angela_Beesley_Starling (last visited Sept. 4, 2009) ("Angela Beesley has tried to have her biography on Wikipedia deleted, saying 'I'm sick of this article being trolled. It's full of lies and nonsense'. [sic] The Register and Wikitruth claim that her objections are ironic in light of the generally liberal policy of Wikipedia administrators to the accuracy and notability of biographies in Wikipedia of living people. Seth Finkelstein, who tried to have his own entry from Wikipedia removed, called it 'a pretty stunning vote of no-confidence. Even at least some high-ups can't eat the dog food.' ") (footnotes omitted).

46. *See, e.g.*, Andrew LaVallee, *Only 13% of Wikipedia Contributors Are Women, Study Says*, WALL ST. J., Aug. 31, 2009, http://blogs.wsj.com/digits/2009/08/31/only-13-of-wikipedia-contributors-are-women-study-says; Jennifer Van Grove, *Study: Women and Wikipedia Don't Mix*, MASHABLE, Sept. 1, 2009, http://mashable.com/2009/09/01/women-wikipedia; Posting of Cathy Davidson to HASTAC, http://www.hastac.org/blogs/cathy-davidson/wikipedia-and-women (Sept. 2, 2009, 9:45 AM).

47. Wikipedia, Melissa Farley, http://en.wikipedia.org/wiki/Melissa_Farley (last visited July 28, 2009).

MacKinnon,[48] and Sheila Jeffries[49] have all been heavily edited[50] by a rabid pornography proponent named Peter G. Werner[51] who sometimes also uses the pseudonym Iamcuriousblue.[52] Each entry is the first result returned after a Google search of their names. He has deleted or attempted to have deleted entries about other feminists.[53] He shows up under one identity or the other in virtually every entry in which feminism is mentioned. And he successfully convinced the Wikipedia community to ban a feminist activist who vigorously contested his edits.[54] Any group that is not well represented within the Wikipedia editing community is likely to experience similar marginalization.

Recently, Wikipedia announced that the entries of living people will receive a mandatory layer of intermediation. A new feature called "flagged revisions" will require that an experienced volunteer editor for Wikipedia sign off on any changes before they become permanent and publicly accessible.[55] A New York Times report noted that this would "divide Wikipedia's contributors into two classes—experienced, trusted editors, and everyone else—altering Wikipedia's implicit notion that everyone has an equal right to edit entries."[56] This seems to be one realization of what Zittrain broadly desires—collaborative control over the ignorant wikimasses by a designated elite.

By the time he reaches the conclusion section of the volume, Zittrain is euphorically touting Wikipedia as a remedy for the ills that he perceives are plaguing the education of minors:

> Instead of being subject to technology that automates and reinforces the worst aspects of contemporary education—emphasizing regurgitation and summarization of content from an oracular source, followed by impersonal grading within a conceptual echo chamber—our children ought to be encouraged to accept the participatory invitation of the Net and that

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48. Wikipedia, Catharine MacKinnon, http://en.wikipedia.org/wiki/Catharine_MacKinnon (last visited July 28, 2009).

49. Wikipedia, Sheila Jeffreys, http://en.wikipedia.org/wiki/Sheila_Jeffreys (last visited July 28, 2009).

50. *See, e.g.*, Wikipedia, Catharine MacKinnon Talkpage, http://en.wikipedia.org/wiki/Talk:Catharine_MacKinnon (last visited July 28, 2009).

51. Wikipedia, Peter G Werner Userpage, http://en.wikipedia.org/wiki/User:Peter_G_Werner (last visited July 28, 2009).

52. Wikipedia, Iamcuriousblue Userpage, http://en.wikipedia.org/wiki/User:Iamcuriousblue (last visited July 28, 2009).

53. *See, e.g.*, Wikipedia, Articles for deletion/Cheryl Lindsey Seelhoff, http://en.wikipedia.org/w/index.php?title=Wikipedia:Articles_for_deletion/Cheryl_Lindsey_Seelhoff&oldid=150110815 (last visited Sept. 25, 2009); Wikipedia, Nikki Craft Talkpage, http://en.wikipedia.org/wiki/Talk:Nikki_Craft (last visited Sept. 25, 2009) [hereinafter Nikki Craft Talkpage].

54. Telephone interview with Nikki Craft; *see also* Nikki Craft Talkpage, *supra* note 53 (containing conversation in which user Iamcuriousblue discredits Nikki Craft's Wikipedia article).

55. Noam Cohen, *Wikipedia to Limit Changes to Articles on People*, N.Y. TIMES, Aug. 25, 2009, at B1.

56. *Id.*

> which has recursively emerged at its upper layers from its open technologies below. Wikipedia's conceded weakness as a source is an invitation to improve it, and the act of improving it can be as meaningful to the contributor as to those who come after. Our students can be given assignments that matter—reading with a critical eye the sources that the rest of the online world consults, and improving them as best they know how, using tools of research and argument and intellectual honesty that our schools can teach. Instead of turning in a report for a single teacher to read, they can put their skills into work that everyone can read. The millions of students doing make-work around the world can come to learn instead that what they do can have consequences—and that if they do not contribute, it is not necessarily true that others will. (p. 244)

The basis for Zittrain's acidly negative view of the education "our children" are receiving is not elucidated. Wikipedia certainly could be a tool with which to teach critical reading, among other analytical skills. But he never explains exactly what the barriers are to this, other than fear of plagiarism, or how specifically he purports to overcome them. Many teachers, me included, think consulting Wikipedia entries is a reasonable way to research a topic, as long as other sources, linked or not, are consulted as well.

Wikipedia entries are generated by a massive assemblage of volunteers with unknown motivations and agendas. Group behavior is always unpredictable, a fact that Zittrain acknowledges but underappreciates. Recently a cyber-vigilante group called "Anonymous" claims to have undertaken efforts to assist antigovernment protesters in Iran, crediting itself with fighting tyranny.[57] That may sound like a positive goal, but Anonymous has a complicated history. Anonymous has waged campaigns of cyber harassment against the Church of Scientology, most recently flooding its servers with fake data requests, and setting up a project wiki "direct[ing] Anonymous members to download and use denial of service software, make prank calls, host Scientology documents the Church considers proprietary, and fax endless loops of black pages to the Church's fax machines to waste ink."[58] In January 2008, Anonymous mailed at least nineteen letters to Scientology facilities in Southern California containing

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57. Anonymous Iran, Why We Protest—IRAN, http://iran.whyweprotest.net/ (last visited July 28, 2009); Jay Fowler, *Anonymous Joins Fight Against Tyranny In Iran*, BUS. PUNDIT, June 18, 2009, http://www.businesspundit.com/anonymous-joins-fight-against-tyranny-in-iran/; *Iran Activists Get Assist from 'Anonymous,' Pirate Bay*, PATRIOT MISSIVE, June 18, 2009, http://patriotmissive.com/2009/06/iran-activists-get-assist-from-%E2%80%98anonymous%E2%80%99-pirate-bay/; internet video: This is why we protest (Anonymous Iran 2009), http://trancy.net/iran/anon/ (last visited Sept. 25, 2009).

58. Posting of Ryan Singel to Threat Level, *War Breaks Out Between Hackers and Scientology—There Can Be Only One*, WIRED, http://www.wired.com/threatlevel/2008/01/anonymous-attac/ (Jan. 23, 2008, 11:16 EST); *see also* Dan Warne, *"Anonymous" threatens to "dismantle" Church of Scientology via internet*, APCMAG.COM, Jan. 24, 2008, http://apcmag.com/anonymous_threatens_to_dismantle_church_of_scientology_via_internet.htm; Press Release, Chan Enterprises, *Internet Group Anonymous Declares "War on Scientology"*, PRLOG, Jan. 21, 2008, http://www.prlog.org/10046797-internet-group-anonymous-declares-war-on-scientology.htm; Posting of Evolved Rationalist to Evolved and Rat/i/onal, *Clueless Scientologist + Fox News = LULZ*, http://www.evolvedrational.com/2008/06/clueless-scientologist-fox-news-lulz.html (June 24, 2008, 14:38 EST).

white powder and bomb threats.[59] Using violence to repress the free exercise of a religion is ghastly, no matter how vehemently one might disagree with its tenets.

Anonymous and (potentially) other groups using similar tactics have also targeted feminist blogs,[60] gay websites[61] (and possibly gay bars[62]), and a series of individuals against whom Anonymous members or similar malefactors apparently hold grudges.[63] In addition to having their blogs rendered inoperable, the targets received threatening phone calls and other forms of harassment.[64] I got involved in trying to assist some of the victimized bloggers, but was unable to persuade anyone in law enforcement that something illegal might be happening. Nor did online norms have any cognizable role

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59. VA. FUSION CTR., VA. DEP'T OF STATE POLICE, 2009 VIRGINIA TERRORISM THREAT ASSESSMENT 78 (2009), *available at* http://www.infowars.com/virginia-fusion-center-releases-homegrown-terrorism-document/.

60. Anna Greer, Op-Ed., *Misogyny bares its teeth on internet*, SYDNEY MORNING HERALD (Austl.), Aug. 21, 2007, *available at* http://www.smh.com.au/news/opinion/misogyny-bares-its-teeth-on-internet/2007/08/20/1187462171087.html?page=fullpage#contentSwap1; Posting of cat to Stu-dent Av-a-tar, *A rape culture in cyberspace? [Part One]*, (Mar. 24, 2008, 04:29 EST); *see also* Posting of Violet to Reclusive Leftist, *Blogging is more dangerous than I thought*, http://www.reclusiveleftist.com/2007/08/14/blogging-is-more-dangerous-than-i-thought/ (Aug. 14, 2007) (discussing hostile takeover of blog by a user similar to "Anonymous"); Women's Space, *Blogging While Female. Hacking as Sexual Terrorism*, http://womensspace.wordpress.com/2007/08/06/blogging-while-female-men-win-hacking-as-sexual-terrorism/ (Aug. 6, 2007) (same).

61. Tony Grew, *Gay beauty contest website targeted by vandals*, PINK NEWS, Aug. 26, 2008, http://www.pinknews.co.uk/2008/08/26/gay-beauty-contest-website-targeted-by-vandals/; Posting of Brian Crecente to Kotaku, *GayGamer Target of Hate Crime*, http://kotaku.com/gaming/crime/gaygamer-target-of-hate-crime-286127.php (Aug. 5, 2007, 11:32 EST).

62. Nick Perry, *11 gay bars get letters threatening ricin attacks*, SEATTLE TIMES, Jan. 7, 2009, *available at* http://seattletimes.nwsource.com/html/localnews/2008597989_ricinthreat07m.html; Posting of Dan Savage to Slog, *RICIN: Seattle Gay Bars Receive Threatening Letters*, THE STRANGER, http://slog.thestranger.com/slog/archives/2009/01/06/gay_bars_receive_threatening (Jan. 7, 2009, 10:00 PST).

63. *E.g.*, Shaun Davies, *'No Cussing' teen faces net hate campaign*, NINEMSN NEWS, Jan. 18, 2009, http://news.ninemsn.com.au/technology/720115/no-cussing-teen-faces-net-hate-campaign ("McKay Hatch's No Cussing Club, which encourages teens to 'chill on the profanity', claims to have over 20,000 members worldwide. Hatch, a 15-year-old from South Pasadena in California, garnered wide media coverage for his anti-swearing campaign, including an appearance on Dr Phil. But at the beginning of the year, Hatch's email inbox began clogging up with hate mail from an unknown source. Pizza and porn deliveries became commonplace for his family, who eventually called in the FBI after numerous receiving [sic] death threats and obscene phone calls. Anonymous appears to be behind the attacks, with threads on sites such as 4chan.org and 711chan.org identifying their members as the culprits. And the pain may not yet be over for the Hatch family—Anonymous appears to be planning future raids and has threatened to 'wipe this cancer [the No Cussing Club] from the face of the internet'. [sic] In one 4chan thread, a number of users boasted about sending bogus pizza deliveries and even prostitutes to the Hatch's house, although it was impossible to verify if these claims were genuine. The same thread also contained a credit card number purported to be stolen from Hatch's father, phone numbers, the family's home address and Hatch's instant messenger address."); *see also Behind the Façade of the "Anonymous" Hate Group*, RELIGIOUS FREEDOM WATCH, July 6, 2009, http://www.religiousfreedomwatch.org/media-newsroom/behind-the-facade-of-the-%E2%80%9Canonymous%E2%80%9D-hate-group/; Encyclopedia Dramatica, Alex Wuori, http://encyclopediadramatica.com/Alex_Wuori (last visited July 28, 2009).

64. Cheryl Lindsey Seelhoff, *Threatened Into Silence: An Interview with Kim ("BB") of the "Den of the Biting Beaver"*, OFF OUR BACKS, July 2007, *available at* http://findarticles.com/p/articles/mi_qa3693/is_200701/ai_n19512050/.

in addressing these attacks. As with Wikipedians, Anonymous is hostile to others and outsiders. One blogger noted:

> Interestingly . . . Anon never seems to take down the big sites. Walmart.com and the Pentagon are safe from his attentions. It's not that Anon is a big fan of Walmart or the government. It's just so much easier to attack the vulnerable. Big business and big government aren't vulnerable on the Internet. They can afford not to be.
>
> Small discussion boards and blogs, particularly ones that advocate unpopular points of view, are often run by individuals who put up their own funds, if they can scrape them together, and who must be their own IT departments. They can't afford the type of security that requires the big bucks. And since they have jobs (unlike Anon, apparently), they have to put their desire to maintain an Internet presence in the balance with supporting themselves and their families. When the crunch comes and time pressures set in, it's not the Internet presence that wins out.
>
> So the actions of these "apolitical" hackers do have a political end: they remove unpopular, radical, fringe viewpoints from the web. Big government doesn't have to eliminate the subversive websites; Anon will do it.[65]

Anonymous also went after people with epilepsy, filling an epilepsy-support message board with JavaScript code and flashing computer animation intended to trigger migraine headaches and seizures in some users.[66] The activities of Anonymous have been characterized as domestic terrorism.[67] And Anonymous certainly takes advantage of generative technologies, just as Wikipedians with reprehensible agendas do. Zittrain asserts that bad actors like Anonymous are driving the demand for increased security,[68] but he doesn't provide any targeted mechanisms for hindering them.

Zittrain's pragmatic and theoretical imperatives are an instantiation of norms that attain and sustain a Goldilocks level of generativity: neither too hot nor too cold, too big nor too small, too hard nor too soft. Somehow, an exclusive group of online throttle wielders will get it just right.

III. THE ZITTRAINNET'S NETIZENS: OVERLORDS OF GOOD FAITH

As with a James Joyce novel, there are a variety of transactions that the careful reader negotiates with the author. Each section has to be read

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65. VeraCity, *Dominator Tentacles*, http://vera.wordpress.com/2007/08/24/dominator-tentacles/ (Aug. 24, 2007).

66. Kevin Poulsen, *Hackers Assault Epilepsy Patients via Computer*, WIRED, Mar. 28, 2008, *available at* http://www.wired.com/politics/security/news/2008/03/epilepsy ("Circumstantial evidence suggests the attack was the work of members of Anonymous, an informal collective of griefers best known for their recent war on the Church of Scientology. The first flurry of posts on the epilepsy forum referenced the site EBaumsWorld, which is much hated by Anonymous. And forum members claim they found a message board thread—since deleted—planning the attack at 7chan.org, a group stronghold.").

67. VA. FUSION CTR., *supra* note 59, at 45.

68. This is one of the central claims of the book. *See generally* chapter 3.

independently of the others, because while it may cohere internally, it may not combine with other delineated portions to paint a consistent picture of Zittrain's preferred future for the Internet, which will hereafter be called the "Zittrainnet."

Some of the recommendations he makes invite broad democratic participation in Zittrainnet governance, while other times he warns against it and suggests ways to decrease the threats posed "by outsiders—whether by vendors, malware authors, or governments" (p. 173). One wonders how something as disaggregated as the Internet can have outsiders, until recognition dawns about what Zittrain is truly suggesting, at least part of the time, in terms of who should control the Internet to best ensure its evolution into the Zittrainnet: an elite circle of people with computer skills and free time who share his policy perspective.

A. *Technologists Rule*

Bill McGeveran has opined, "The fact that anyone can develop code to perform unanticipated functions and distribute it to the rest of the world with ease is the essence of generativity."[69] He's correct in the abstract. But he perceives Zittrain's construction of generativity as less elitist than I do. Zittrain doesn't contemplate "anyone" developing serviceable code. Zittrain's view is that only a select few can take productive advantage of generativity, and within this elite group are bad actors as well as good. He thinks that cyberlaw is the appropriate mechanism to encourage positive uses of generativity while thwarting the troublesome ones, cyberlaw being computer-code construction and norm entrepreneurship within Internet communities, as well as more traditionally recognized modes of law formation such as statutes and regulations (Chapter Five). As far as who exactly will divine good generativity from bad, and wield the mighty sword of cyberlaw to defend the former and defeat the latter, Zittrain is decidedly vague. In the "Solutions" section of the tome Zittrain lists "two approaches that might save the generative spirit of the Net":

> The first is to reconfigure and strengthen the Net's experimentalist architecture to make it fit better with its now-mainstream home. The second is to create and demonstrate the tools and practices by which relevant people and institutions can help secure the Net themselves instead of waiting for someone else to do it. (p. 152)

By "relevant people and institutions" Zittrain seems to mean technologically skilled, Internet users of goodwill (p. 246). But as far as who it is that will "reconfigure and strengthen the Net's experimentalist architecture" or who will "create and demonstrate the tools and practices" on behalf of these relevant people and institutions (shall we call them "generativators?"), Zittrain offers few specifics. He mentions universities

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69. Posting of William McGeveran to Info/Law, *Thoughts on Jonathan Zittrain's "Generative Internet"*, http://blogs.law.harvard.edu/infolaw/2006/05/25/thoughts-on-jonathan-zittrains-generative-internet/ (May 25, 2006).

generally (pp. 198, 245), and two organizations he is affiliated with specifically, Harvard University's Berkman Center and the Oxford Internet Institute, which he describes as "multidisciplinary academic enterprises dedicated to charting the future of the Net and improving it" (p. 159). Those who share his visions for the Zittrainnet are supposed to function as norm entrepreneurs, guiding lights for the undereducated, inadequately skilled online masses to follow, sheep like.

Less-relevant people are described as "[r]ank-and-file Internet users [who] enjoy its benefits while seeing its operation as a mystery, something they could not possibly hope to affect" (p. 245). These nongenerativators frighten Zittrain, because when a crisis comes he fears they will pressure the government to enhance Internet security at the expense of Internet generativity, out of short-sighted, ill-informed perceptions of their own self-interest (p. 245).

In a related article he published in *Legal Affairs* to promote the book, Zittrain explains:

> If the Internet does have a September 11 moment, a scared and frustrated public is apt to demand sweeping measures to protect home and business computers—a metaphorical USA Patriot Act for cyberspace. Politicians and vendors will likely hasten to respond to these pressures, and the end result will be a radical change in the technology landscape. The biggest casualty will likely be a fundamental characteristic that has made both the Internet and the PC such powerful phenomena: their "generativity."[70]

Many of the stories Zittrain tells in the book are intended to persuade readers that unless somebody does something, the Internet will do what the book's cover suggests: derail and drive over a cliff. But after ominously warning his audience repeatedly that "Steps Must Be Taken Immediately," the particulars of whom somebody is and the details of what s/he should be doing are never made explicit.

In addition, the law component of cyberlaw gets surprisingly little attention in the book, given that Zittrain is a law professor. The community of cyberlaw scholars that Zittrain pays attention to is small, to gauge by citations listed in the book. The cyberlaw discourse among legal scholars has been insular from the very beginning of the field, as evidenced by the didactic interface of cyberlaw-literature designations.[71] In 1996 Judge Frank Easterbrook published an article entitled *Cyberspace and the Law of the Horse*, which questioned the legitimacy of the very concept of cyberlaw.[72]

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70. Zittrain, *supra* note 3, at 34; *see also* Lessig 2.0, *Z's book is out*, http://lessig.org/blog/just_plain_brilliant/ (May 1, 2008, 22:01 PST) [hereinafter Lessig, *Z's book is out*]; Lessig 2.0, *The state of cyberlaw, 2005*, http://lessig.org/blog/read_this/ (Dec. 30, 2005, 14:44 PST) ("Legal Affairs has a fantastic collection of essays about various cyberspace related legal issues by some of my favorite writers about the subject. Zittrain's piece outlines the beginning of his soon to be completed book. It shall be called Z-theory.").

71. *See also* Viktor Mayer-Schönberger, *The Shape of Governance: Analyzing the World of Internet Regulation*, 43 VA. J. INT'L L. 605 (2003) (discussing three types of cyberlaw discourses).

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

This challenge elicited *The Law of the Horse: What Cyberlaw Might Teach* from Larry Lessig in response.[73]

On a neighboring analytical track, David Johnson and David Post penned *Law and Borders—The Rise of Law in Cyberspace.*[74] Jack Goldsmith took issue with aspects of this article in *Against Cyberanarchy,*[75] to which David Post responded in the acidly titled *Against* Against Cyberanarchy.[76]

Meanwhile, in his book *Code and Other Laws of Cyberspace,* Lessig titled Chapter 17 of the tome *What Declan Doesn't Get,* in an inside-baseball–style reference to his professed disagreements with libertarian *Wired* newswriter Declan McCullagh.[77] In riposte David Post titled his review of the work, *What Larry Doesn't Get: Code, Law and Liberty in Cyberspace,*[78] while Marc Rotenberg penned *Fair Information Practices and the Architecture of Privacy (What Larry Doesn't Get),* noting in a footnote that "[i]n offering this title, I am following the convention that is appropriate for this genre."[79] Declan McCullagh gave an interview in 2003 that was published with the title *What Larry Doesn't Get*[80] and deployed the title again himself in a May 2009 essay.[81] All of these works make interesting reading, but they also document the circumscribed and self-referential nature of the field. Zittrain perpetuates the insular circularity by making reference to something that "David Post wrote in response to a law review article that was a precursor to this book" (p. 123).

According to Larry Lessig, "This book will redefine the field we call the law of cyberspace."[82] This is worrisome to anyone still struggling to

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73. Lawrence Lessig, *The Law of the Horse: What Cyberlaw Might Teach,* 113 HARV. L. REV. 501 (1999).

74. David R. Johnson & David Post, *Law and Borders—The Rise of Law in Cyberspace,* 48 STAN. L. REV. 1367 (1996).

75. Jack L. Goldsmith, *Against Cyberanarchy,* 65 U. CHI. L. REV. 1199 (1998).

76. David G. Post, *Against* Against Cyberanarchy, 17 BERKELEY TECH. L.J. 1365 (2002).

77. LAWRENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE 231 (1999).

78. David G. Post, *What Larry Doesn't Get: Code, Law, and Liberty in Cyberspace,* 52 STAN. L. REV. 1439 (2000).

79. Marc Rotenberg, *Fair Information Practices and the Architecture of Privacy: (What Larry Doesn't Get),* 2001 STAN. TECH. L. REV. 1, 1 n.*, http://stlr.stanford.edu/STLR/Articles/01_STLR_1.

80. Steve Bryant, *What Larry Doesn't Get,* README, May 4, 2003, http://journalism.nyu.edu/pubzone/ReadMe/article.php%3Fid=141.html.

81. Posting of Declan McCullagh to Cato Unbound, *What Larry Didn't Get,* http://www.cato-unbound.org/2009/05/04/declan-mccullagh/what-larry-didnt-get/ (May 4, 2009, 09:15 EST). Zittrain began his response to Declan's piece with the words, "OK, enough with who doesn't get what." Posting of Jonathan Zittrain to Cato Unbound, *supra* note 21.

82. Lessig explains his thoughts regarding the importance of Zittrain's book in his blog:

> This book will redefine the field we call the law of cyberspace. That sounds like a hokey blurb no doubt. But hokeness [sic] does not mean it is not true. It is true. The field before this book was us cheerleaders trying to convince a skeptical (academic) world about the importance and value of certain central features of the network. Zittrain gives these features a name—generativity—and then shows us an aspect of this generative net that we cheerleaders would rather you not think much about: the extraordinary explosion of malware and the like that the generative net has also generated.

ascertain the parameters of cyberlaw in the first instance, beyond the macro-concerns about top-down versus bottom-up approaches to governance identified by the scholars mentioned above. The role of law in Zittrainnet's rule of law is extremely limited. Laws concerning jurisdiction, privacy, free speech, copyrights, and trademarks often transmogrify into cyberlaw when they are invoked in an Internet context, but they exist and evolve offline too, which prevents their total capture by cyberlaw scholars. Zittrain's redefinition of cyberlaw compresses debates that engage many complicated, intersecting bodies of law into a much narrower conversation about the value of generativity, and how best to secure the appropriate level of it. In general Zittrain seems quite pessimistic about whether cyberlaw can achieve anything positive beyond somehow (he never tells us how) fostering generativity. At one point in the book he even describes the enforcement of laws online as something that could result in net social losses, and therefore a mechanism of Internet governance that is inferior to "retention of generative technologies."[83]

Zittrain seems to have a lot more confidence in technologists than in attorneys. He waxes rhapsodic about the wisdom and forethought of the "framers" of the Internet throughout the tome.[84] One of "the primary" ways he proposes to address tetheredness and its associative ills is "a series of conversations, arguments, and experiments whose participants span the spectrum between network engineers and PC software designers, between expert users with time to spend tinkering and those who simply want the system to work—but who appreciate the dangers of lockdown" (p. 173). On the Zittrainnet, with the exception of a select few cyberlaw professors, academics in disciplines other than law, particularly computer science, are going to be the true benevolent dictators of cyberlaw, mediating disputes with technological innovations and enforcing their judgments through code.

B. *The Private Sector*

Zittrain quite understandably doubts that for-profit entities will selflessly prioritize the well being of the Internet over their own commercial gain. So, they are unlikely to consistently adhere to progenerative business plans un-

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Lessig, *Z's book is out*, *supra* note 70.

83. Zittrain states:

> Technologies that lend themselves to an easy and tightly coupled expression of governmental power simply will be portable from one society to the next. It will make irrelevant the question about how firms like Google and Skype should operate outside their home countries.
>
> This conclusion suggests that although some social gain may result from better enforcement of existing laws in free societies, the gain might be more than offset by better enforcement in societies that are less free—under repressive governments today, or anywhere in the future. If the gains and losses remain coupled, it might make sense to favor retention of generative technologies to put what law professor James Boyle has called the "Libertarian gotcha" to authoritarian regimes: if one wants technological progress and the associated economic benefits, one must be prepared to accept some measure of social liberalization made possible with that technology. Pp. 113–14.

84. *See* pp. 7, 27, 31, 33, 34, 69, 99.

less they can be convinced that doing so will benefit them. One of Zittrain's objectives in writing the book was to educate the reader about the ways that extensive generativity can serve commercial goals. However, while corporate actors may find Zittrain's book of interest, I suspect actual experiences in the marketplace will be what drives their decisions about tethers and generativity.

Zittrain opens his book with what is framed as an apocryphal tale: Apple II computers were revolutionary because they facilitated the development of new and original uses by outsiders; but thirty years later the same company launched an antigenerativity counterrevolution of sorts by releasing its innovative iPhone in a locked format intended to discourage the use of applications that were not developed or approved by Apple.[85]

But how would Zittrain change this? Surely when the company made this decision, it knew even more than Zittrain about the role that generativity played in the success of the Apple II, but still chose a different strategy for the iPhone. Affirmative curtailment of its generativity initially lowered the risk that iPhones would be plagued by viruses or malware, and allowed Apple to control the ways that most consumers use them. Would Zittrain have forced generativity into the mechanics of the iPhone by law? Or, would he strip Apple of its ability to use the law to interfere when others hack the iPhone and make it more customizable? Or, would he instead simply wait for the market to show Apple the error of its degenerative ways? He never specifies. What he says at the end of his iPhone discussion is:

> A lockdown on PCs and a corresponding rise of tethered appliances will eliminate what today we take for granted: a world where mainstream technology can be influenced, even revolutionized, out of left field. Stopping this future depends on some wisely developed and implemented locks, along with new technologies and a community ethos that secures the keys to those locks among groups with shared norms and a sense of public purpose, rather than in the hands of a single gatekeeping entity, whether public or private. (p. 5)

It sounds like Zittrain wants to prevent Apple from interfering when consumers modify their iPhones. But how he proposes to achieve this is addressed only generally, much later in the book when he suggests vague, persuasion-based solutions. My inner pragmatist thinks strong consumer protection laws might be a viable option to this and many other problems he articulates in the book, but Zittrain mentions that possibility only glancingly, in the context of maintaining data portability (p. 177).

In July of 2008, Apple began allowing software developers to sell software for the iPhone, and tens of thousands of applications have subsequently been independently developed for the iPhone,[86] suggesting

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85. *See generally* pp. 86–87 (summarizing work by Eric von Hippel on the subject).

86. *See e.g.*, Jon Fortt, *iPhone apps: For fun* and *profit?*, FORTUNE TECH DAILY, July 6, 2009, http://money.cnn.com/2009/07/06/technology/apple_iphone_apps.fortune/index.htm; Posting of enigmax to TorrentFreak, *appDowner: A Bit Torrent Powered iPhone App Store*, http://torrentfreak.com/appdowner-a-bittorrent-powered-iphone-app-store-090626/ (June 26, 2009);

either successful deployment of a strategic multistep product rollout Apple had planned all along, or a midcourse marketing correction. In either event, the iPhone cannot accurately be described as nongenerative, at least as I understand the concept,[87] and what Zittrain characterized as a problem seems to have been largely solved without the intervention of cyberlaw. The iPhone is still tethered of course, possibly giving consumers just enough rope to hang themselves if Apple decides to interfere with the contents or operation of any given phone. But tethering also facilitates positive interactions, such as updates and repairs. It is now, to use a phrase Zittrain uses in a different context, "[a] technology that splits the difference between lockdown and openness" (p. 155).

It is true that Apple could alter the iPhone's balance between generativity and tetheredness without notice or reason. But there is every reason to expect that Apple will try to keep its customers happy, especially given increased competition by devices like the Google phone.[88] A recent short review of the book in *The Observer* noted:

> The problem facing books about the internet is that by the time they have hit the shelves, they are already dated. This is clear on the second page of The Future of the Internet, where Jonathan Zittrain writes that the iPhone is purposefully resistant to "applications" (programmes allowing the phone to do clever things apart from make calls).[89]

The problem facing this book is deeper than datedness. Zittrain is wrong in his assumptions about rigidity and fixedness.[90] In the abstract generativity

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Posting of Erica Sadun to TUAW (The Unofficial Apple Weblog), *Developer-to-developer: application sharing for the iPhone simulator*, http://www.tuaw.com/2009/07/03/developer-to-developer-simulator-application-sharing-for-iphone/ (July 3, 2009, 14:00 EST); Fresh Apps for the iPhone, http://www.freshapps.com/ (last visited Sept. 26, 2009); iPhone Applications, http://www.apple.com/iphone/apps-for-iphone/ (last visited Sept. 26, 2009); iPhone Apps Reviewed Daily, http://www.appstoreapps.com/ (last visited Sept. 26, 2009).

87. *See, e.g.*, Posting of Adam Thierer to The Technology Liberation Front, *iPhone 2.0 cracked in hours . . . what was that Zittrain thesis again?*, http://techliberation.com/2008/07/10/iphone-20-cracked-in-hours-what-was-that-zittrain-thesis-again/ (July 10, 2008).

88. Posting of Yi-Wyn Yen & Michal Lev-Ram to Techland, *Google's $199 phone to compete with the iPhone*, http://techland.blogs.fortune.cnn.com/2008/09/17/googles-199-phone-to-compete-with-the-iphone/ (Sept. 17, 2008, 20:04 EST).

89. Helen Zaltzman, *The Future of the Internet by Jonathan Zittrain*, OBSERVER (London), June 14, 2009, at 26, *available at* http://www.guardian.co.uk/books/2009/jun/14/future-internet-zittrain-review.

90. Adam Thierer writes:

> My primary objection to Jonathan's thesis is that (1) he seems to be over-stating things quite a bit; and in doing so, (2) he creates a false choice of possible futures from which we must choose. What I mean by false choice is that Jonathan doesn't seem to believe a hybrid future is possible or desirable. I see no reason why we can't have the best of both worlds—a world full of plenty of tethered appliances, but also plenty of generativity and openness.

Posting of Adam Thierer to The Technology Liberation Front, *review of Zittrain's "Future of the Internet"*, http://techliberation.com/2008/03/23/review-of-zittrains-future-of-the-internet/ (Mar. 23, 2008); *see also* Posting of Timothy B. Lee to Freedom to Tinker, *Sizing Up "Code" with 20/20 Hindsight*, http://www.freedom-to-tinker.com/blog/tblee/sizing-code-2020-hindsight (May 14, 2009, 08:33 EST). Timothy B. Lee writes:

and tetheredness may be opposites, but in reality they can exist within a single appliance. He actually makes this point when he describes computers with dual applications designated "red" and "green," one generative and the other secure (pp. 154–57). But he does not acknowledge that single technological devices may already shift between tethered and generative functions, driven by the demands of their users.

Making assumptions about consumer preferences can be hazardous, even when done by people with seemingly benign motivations. In 2004 Volvo commissioned an all-women engineering team to design a concept car (dubbed Your Concept Car, or YCC) that would be attractive to women.[91] It featured a ponytail notch in the headrest, plentiful storage space, and interchangeable seat covers and carpeting fabrics. It also lacked a hood, because "[t]he design team determined that their target audience doesn't need to look under the hood."[92] The front section of the chassis could be lifted in a garage by a mechanic, but did not open like a traditional hood to provide engine access to the driver.[93] This automobile was nongenerative because drivers could not even access the engine, no less tinker with it, but simultaneously somewhat generative because it contained myriad purportedly driver-driven innovations. I guess you could say the car was "half baked" (sound of rim shot and groans).

Whether targeted consumers would have chosen the car if it had been brought into commercial production is unknowable. Certainly media accounts instantiated numerous stereotypes concerning women drivers. Car commentators evidenced a startling obsession with women's fingernails, as noted by observers who wrote:

> Repeatedly the low-maintenance features of the car accompany references to the high-maintenance nature of women. For example, a BBC report mentions "an external filler point for washer fluid (no breaking your nails while trying to open the bonnet)." The car's features fit a woman's presumed fragility and fastidiousness. It lacks a gas cap, so fingernails will not be broken trying to pry it open. Snide (although sometimes tongue-in-cheek) remarks about women breaking their fingernails reappear, this time relating to the washer fluid container: "Now for the stuff the girlz [sic]

> I think Jonathan Zittrain's The Future of the Internet and How to Stop It makes the same kind of mistake Lessig made a decade ago: overestimating regulators' ability to shape the evolution of new technologies and underestimating the robustness of open platforms. The evolution of technology is mostly shaped by engineering and economic constraints. Government policies can sometimes force new technologies underground, but regulators rarely have the kind of fine-grained control they would need to promote "generative" technologies over sterile ones, any more than they could have stopped the emergence of cookies or DPI if they'd made different policy choices a decade ago.

Id.

91. Kevin Bonsor, *How the Volvo Your Concept Car Works*, HOWSTUFFWORKS.COM, June 17, 2004, http://auto.howstuffworks.com/volvo-concept.htm; *cf.* Jo Twist, *Technology's gender balancing act*, BBC NEWS, Oct. 11, 2004, http://news.bbc.co.uk/1/hi/technology/3680146.stm (noting that the YCC was not designed specifically for women).

92. Bonsor, *supra* note 91.

93. *Id.*

> reckon will make for a car that's going to 'exceed the expectations of men.' Combine this with an external filler point for washer fluid (no breaking your nails while trying to open the bonnet) . . . ." Recurrent references to fingernails act metonymically to encapsulate what womanhood means from the auto manufacturer's perspective: accommodate cosmetic impediments. The following observation places YCC squarely within the masculine tradition of design adaptations to women: "The car industry has been trying for years and years to design a car that appeals to women," says Bob Peterson, an automotive consultant in Europe. "When Lexus did its research for the original LX400 in the late '80s, they studied the length of women's fingernails so they could design the (electric) window switches so they wouldn't chip or break nails." Instead of questioning the social pressure for women to sport fingernails so long they impede proper finger functions, the development team simply designed around the dysfunction.[94]

The Zittrainnet's netizens, being human, are likely to engage in all manner of typecasting and generalizing when they redesign their Internet sectors of interest. If the leading netizens echo the demographic pattern of the cyberlaw scholars, white men with elite educations will be making most of the calls.[95] And Internet governance will be exceedingly top down in nature.

At present companies can dramatically alter the levels of tetheredness and generativity in their products and services for any reason or no reason at all, and Zittrain never explains what sort of regulations or market interventions he thinks are necessary to achieve or preserve the Zittrainnet. He is critical of companies that assist totalitarian governments with surveillance or censorship initiatives (pp. 112–13), but fails to acknowledge the reason that many technologies are developed so that they can be readily employed to spy on people: companies want to be able to shadow and scrutinize their customers themselves. Consumers usually agree to this scrutiny in nonnegotiable EULA terms and conditions. For companies, closely following the acts and omissions of their customers or client base is generative behavior, even though it relies on tethers. Information about consumers can lead to innovations in goods and services as well as in marketing them.

C. *Governments*

Zittrain communicates grave concerns about government intervention on the Internet. He does not seem to believe that government actors can competently safeguard users, or effectively regulate technology. And he fears governments will further harness the Internet to advance surveillance and censorship agendas that are anathema to freedom. Zittrain writes with deep foreboding:

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94. Roy Schwartzman & Merci Decker, A Car of Her Own? Volvo's Your Concept Car as a Vehicle for Feminism 10–11 (Nov. 15, 2007) (unpublished manuscript, presented at the National Communication Association's 93rd Annual Convention), *available at* http://www.allacademic.com//meta/p_mla_apa_research_citation/1/9/1/0/2/pages191023/p191023-1.php (citations omitted).

95. *See* Anupam Chander, *Whose Republic?*, 69 U. CHI. L. REV. 1479, 1484–85 (2002) (reviewing CASS SUNSTEIN, REPUBLIC.COM (2001)).

> The rise of tethered appliances significantly reduces the number and variety of people and institutions required to apply the state's power on a mass scale. It removes a practical check on the use of that power. It diminishes a rule's ability to attain legitimacy as people choose to participate in its enforcement, or at least not stand in its way. (p. 118)

So it is kind of strange to learn that his solution to too much tethering is "a latter-day Manhattan Project" (p. 173). The Manhattan Project was of course the code name for the U.S. government's secret project to develop a nuclear bomb. It may have been staffed by scientists, many of whom were academics, but it was organized, funded, and strictly controlled by the government.[96] An analogous initiative to formulate the Zittrainnet would hardly be open and accessible to the online public. Moreover, governments generally take some kind of proprietary interest in the outcomes of projects they fund. Even under the Bayh-Dole Act,[97] which allows universities in the United States to patent inventions developed with federal funding, the U.S. government retains march-in rights.[98] Zittrain seems to want the resources that governments can provide without any of the restrictions or obligations governments want to impose. It's possible that a well-crafted Zittrainet Project could receive the unconditional support of government actors, but I don't think this is terribly likely to happen.

Surprisingly, one of the success stories for generativity that Zittrain references is the Digital Millennium Copyright Act of 1998.[99] Not only did this require government intervention in the form of traditional law, but it also relied on tethering. Web sites could not take down potentially infringing material without retaining a level of control that enables this.

In addition to generativity, one of the defining principles of the Zittrainnet will be adherence to First Amendment principles. Zittrain's descriptions of online freedom and autonomy suggest a strong belief that all the countries of the world should honor and implement the free-speech values of the First Amendment, whether they want to or not.[100] This raises complicated issues of state sovereignty and international law that Zittrain does not address.

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96. U.S. DEP'T OF ENERGY, OFFICE OF HISTORY & HERITAGE RES., *Early Government Support*, *in* THE MANHATTAN PROJECT: AN INTERACTIVE HISTORY, http://www.cfo.doe.gov/me70/manhattan/1939-1942.htm (last visited July 30, 2009); *The Manhattan Project (and Before)*, *in* THE NUCLEAR WEAPON ARCHIVE, http://nuclearweaponarchive.org/Usa/Med/Med.html (last visited Oct. 4, 2009); U.S. DEP'T OF ENERGY, OFFICE OF HISTORY & HERITAGE RES., *A Tentative Decision to Build the Bomb*, *in* THE MANHATTAN PROJECT: AN INTERACTIVE HISTORY, http://www.cfo.doe.gov/me70/manhattan/tentative_decision_build.htm (last visited July 30, 2009).

97. 35 U.S.C. §§ 200–212 (2006).

98. *Id.* § 203.

99. Pub. L. No. 105–304, 112 Stat. 2860 (1998). For Zittrain's discussion of the DMCA, see pp. 119–20.

100. *Contra* Joel R. Reidenberg, *Yahoo and Democracy on the Internet*, 42 JURIMETRICS 261 (2002).

CONCLUSION

I've been very hard on *The Future of the Internet* in this Review, but I truly did enjoy reading it. The book is very informative, if you can sift through the portions that were contrived to illustrate an unconvincing macrotheory of the Internet. I wish Zittrain had written a book that set out only to describe the history and state of the Internet, rather than one that was formulated to support questionable generalizations and grandiose prescriptions. He could have told many of the same extremely interesting stories, but with more balance and less of a blatant "big think" agenda.

The book is woefully lacking in specifics, in terms of advancing the reforms Zittrain asserts are necessary.[101] Even if I were willing to buy into Zittrain's claim that preserving and enhancing generativity should be the organizing principle of the Internet governance interventions, the mechanics of how this could be pursued holistically are never revealed. And the technicalities by which good generativity could be fostered while bad generativity was simultaneously repressed are similarly unstated. The only extensively developed account of a generative system Zittrain unabashedly admires is Wikipedia, which he admits is undemocratic.[102] It is also a system that facilitates repression of unpopular viewpoints, and this is likely to affect outsider groups most dramatically.

Who will step forward to somehow cultivate the Zittrainnet is a mystery. The future of the Internet, Zittrain asserts, would be much safer in the hands of those who can competently safeguard it. He describes these people in very general terms as being skilled and of good faith. These hands do not belong to people who are affiliated with dot-coms, because they use tethering to constrain generativity when doing so is profitable. Nor do they belong to dot-gov bureaucrats, who are at best uninformed and at worst eager to use the Internet to enforce regimes of totalitarian rule. Readers of the book learn a lot more about who Zittrain thinks should not be in control of the Internet than who should be. But there are a number of hints and suggestions scattered throughout its pages that he believes he and his colleagues are well placed to direct the Internet's future. If they are going to attempt to do this by writing books, perhaps Zittrain's offering makes sense as a declaration of first principles. Maybe his next book will describe the steps along the path to the Zittrainnet more concretely.

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101. *See, e.g.*, chainlynx / cl-l41nl`/n><, *Critique of Zittrain's "The Future of the Internet and How to Stop It"*, http://chainlynx.blogspot.com/2008/09/critique-of-zittrans-future-of-internet.html (Sept. 8, 2008, 18:43 PST) ("For a book whose title suggests solutions to the problems with the Internet, Zittrain's ideas underdeliver. Virtual machines, extra-legal incentives, data portability and network neutrality are all things that are familiar, and have been, to policymakers and programmers for a while. In a book such as this which only worries about theoretical overtures and not about the detailed technical implementation, more out-of-the-box, grander thinking and proposals would have been welcome.").

102. P. 141 ("And Wikipedia is decidedly not a democracy: consensus is favored over voting and its head counts.").