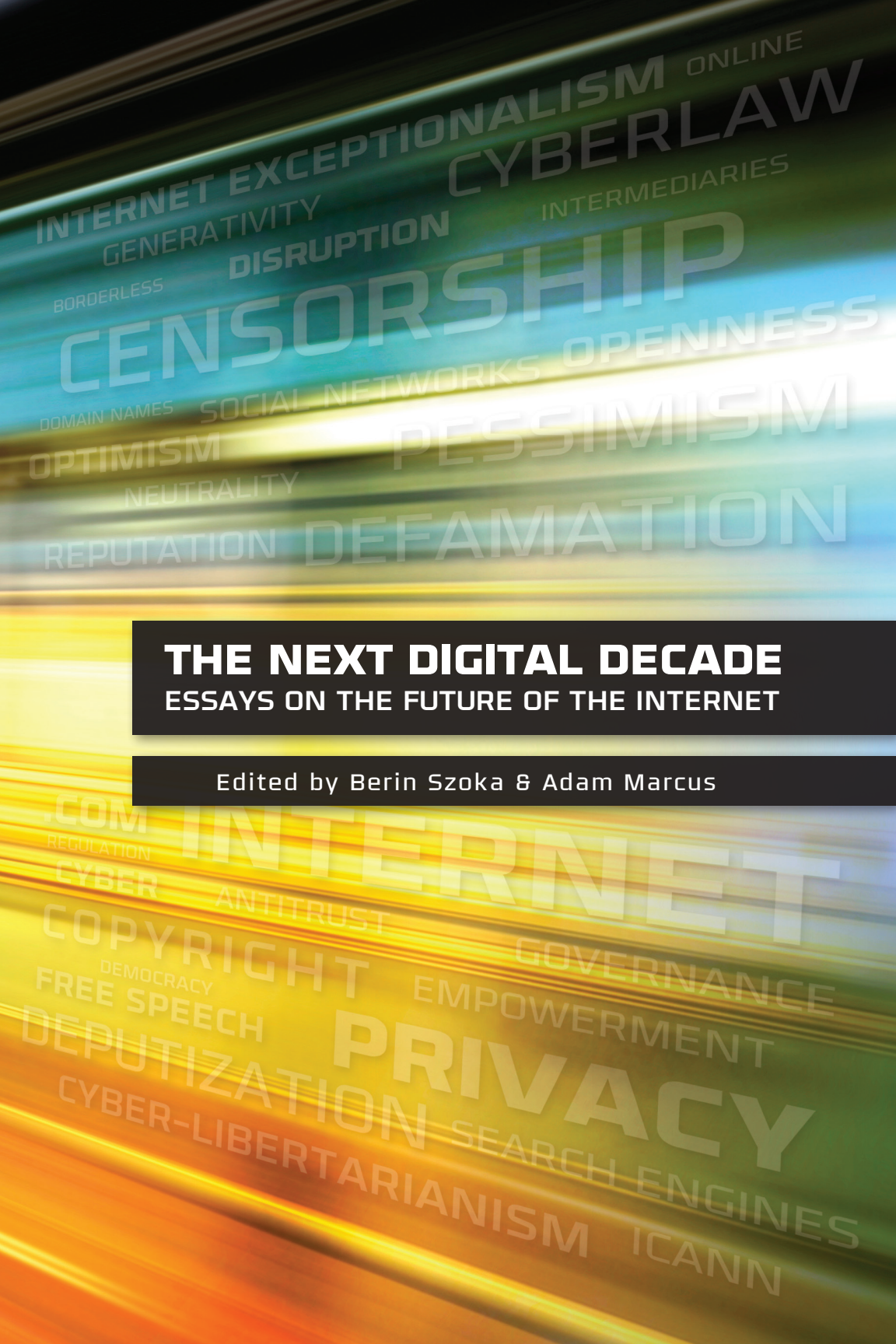

THE NEXT DIGITAL DECADE

ESSAYS ON THE FUTURE OF THE INTERNET

Edited by Berin Szoka & Adam Marcus

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CHAPTER 2

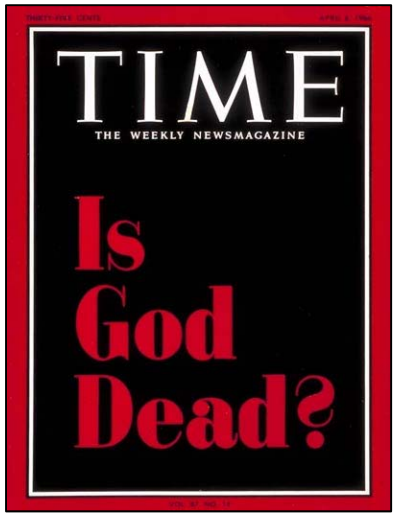
IS THE GENERATIVE INTERNET AT RISK?

The Case for Internet Optimism, Part 2: Saving the Net from Its *Supporters*

By Adam Thierer*

In an earlier essay, I argued that two distinct strands of "Internet pessimism" increasingly dominate Internet policy discussions. The pessimism of "Net skeptics" is rooted in a general skepticism of the supposed benefits of cyberspace, digital technologies, and information abundance. Here, I respond to a very different strand of Internet pessimism—one expressed by fans of the Internet and cyberspace who nonetheless fear that dark days lie ahead unless steps are taken to "save the Net" from a variety of ills, especially the perceived end of "openness."

Introduction: Is the Web Really Dying?



"The Death of the Internet" is a hot meme in Internet policy these days. Much as a famous *Time* magazine cover asked "Is God Dead?" in 1966,[1] *Wired* magazine, the magazine for the modern digerati, proclaimed in a recent cover story that "The Web is Dead."[2] A few weeks later, *The Economist* magazine ran a cover story fretting about "The Web's New Walls," wondering "how the threats to the Internet's openness can be averted."[3] The primary concern expressed in both essays:

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1 "Is God Dead?" TIME, April 8, 1966, **www.time.com/time/covers/0,16641,19660408,00.html**

2 Chris Anderson & Michael Wolff, *The Web Is Dead. Long Live the Internet*, WIRED, Aug. 17, 2010, **www.wired.com/magazine/2010/08/ff_webrip/all/1**. Incidentally, there's a long history of pundits declaring just about everything "dead" at some point, from email, RSS, and blogging to eReaders, browser, and even Facebook and Twitter. *See* Harry McCracken, *The Tragic Death of Practically Everything*, TECHNOLOGIZER, Aug. 18, 2010, **http://technologizer.com/2010/08/18/the-tragic-death-of-practically-everything**

3 *The Web's New Walls*, THE ECONOMIST, Sept. 2, 2010, **www.economist.com/research/articlesBySubject/displayStory.cfm?story_id=16943579&subjectID=348963&fsrc=nwl**

The wide-open Internet experience of the past decade is giving way to a new regime of corporate control, closed platforms, and walled gardens.

This fear is given fuller elucidation in recent books by two of the intellectual godfathers of modern cyberlaw: Jonathan Zittrain's *The Future of the Internet—And How to Stop It*,[4] and Tim Wu's *The Master Switch: The Rise and Fall of Information Empires*.[5] These books are best understood as the second and third installments in a trilogy that began with the publication of Lawrence Lessig's seminal 1999 book, *Code and Other Laws of Cyberspace*.[6]

Lessig's book framed much of how we study and discuss cyberlaw and Internet policy. More importantly, *Code* spawned a *bona fide* philosophical movement within those circles as a polemic against both cyber-libertarianism and Internet exceptionalism (closely related movements), as well as a sort of call to arms for a new Net activist movement. The book gave this movement its central operating principle: Code and cyberspace *can* be bent to the will of some amorphous collective or public will, and it often *must* be if we are to avoid any number of impending disasters brought on by nefarious-minded (or just plain incompetent) folks in corporate America scheming to achieve "perfect control" over users.

It's difficult to know what to label this school of thinking about Internet policy, and Prof. Lessig has taken offense at me calling it "cyber-collectivism."[7] But the collectivism of which I speak is a more generic type, not the hard-edged Marxist brand of collectivism of modern times. Instead, it's the belief that markets, property rights, and private decision-making about the future course of the Net must yield to supposedly more enlightened actors and mechanisms. As Declan McCullagh has remarked, Lessig and his students

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

5 TIM WU, THE MASTER SWITCH: THE RISE AND FALL OF INFORMATION EMPIRES (2010).

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

7 Adam Thierer, *Our Conflict of Cyber-Visions*, CATO UNBOUND, May 14, 2009, **www.cato-unbound.org/2009/05/14/adam-thierer/our-conflict-of-cyber-visions/**

> prefer … what probably could be called technocratic philosopher kings, of the breed that Plato's *The Republic* said would be "best able to guard the laws and institutions of our State—let them be our guardians." These technocrats would be entrusted with making wise decisions on our behalf, because, according to Lessig, "politics is that process by which we collectively decide how we should live."[8]

What is it, exactly, that these cyber-collectivists seek to protect or accomplish? To the extent it can be boiled down to a single term, their rallying cry is: Openness! "Openness" is almost always The Good; anything "closed" (restricted or proprietary) in nature is The Bad. Thus, since they recoil at the "cyber-collectivist" label, we might think of adherents to this philosophy as "Openness Evangelicals," since they evangelize in favor of "openness" and seemingly make all else subservient to it.

For example, in *Future of the Internet*, Zittrain argues that, for a variety of reasons, we run the risk of seeing the glorious days of "generative" devices and the "open" Internet give way to more "tethered appliances" and closed networks. He says:

> Today, the same qualities that led to [the success of the Internet and general-purpose PCs] are causing [them] to falter. As ubiquitous as Internet technologies are today, the pieces are in place for a wholesale shift away from the original chaotic design that has given rise to the modern information revolution. This counterrevolution would push mainstream users away from the generative Internet that fosters innovation and disruption, to an appliancized network that incorporates some of the most powerful features of today's Internet while greatly limiting its innovative capacity—and, for better or worse, heightening its regulability. A seductive and more powerful generation of proprietary networks and information appliances is waiting for round two. If the problems associated with the Internet and PC are not addressed, a set of blunt solutions will likely be applied to solve the problems at the expense of much of what we love about today's information ecosystem.[9]

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8 Declan McCullagh, *What Larry Didn't Get*, CATO UNBOUND, May 4, 2009, **www.cato-unbound.org/2009/05/04/declan-mccullagh/what-larry-didnt-get**

9 Zittrain, *supra* note 4 at 8.

In other words, Zittrain fears most will flock to tethered appliances in a search for stability or security. That's troubling, he says, because those tethered appliances are less "open" and more likely to be "regulable," either by large corporate intermediaries or government officials. Thus, the "future of the Internet" Zittrain is hoping to "stop" is a world dominated by tethered digital appliances and closed walled gardens because they are too easily controlled by other actors.

My primary beef with these "Openness Evangelicals" is not that openness and generativity aren't fine generic principles but that:

1. They tend to significantly overstate the severity of this problem (the supposed decline of openness or generativity, that is);

2. I'm more willing to allow evolutionary dynamism to run its course within digital markets, even if that means some "closed" devices and platforms remain (or even thrive); and,

3. It's significantly more likely that the "openness" advocated by Openness Evangelicals will devolve into expanded government control of cyberspace and digital systems than that unregulated systems will become subject to "perfect control" by the private sector, as they fear.

More generally, my problem with this movement—and Zittrain's book, in particular—comes down to the dour, depressing "the-Net-is-about-to-die" fear that seems to fuel this worldview. The message seems to be: "Enjoy the good old days of the open Internet while you can, because any minute now it will be crushed and closed-off by corporate marauders!" Lessig started this nervous hand-wringing in *Code* when he ominously predicted that "Left to itself, cyberspace will become a perfect tool of control."[10] Today, his many disciples in academia (including Zittrain and Wu) and a wide variety of regulatory advocacy groups continue to preach this gloomy gospel of impending digital doom and "perfect control" despite plenty of evidence that supports the case for optimism.

For example, Wu warns there are "forces threatening the Internet as we know it"[11] while Zittrain worries about "a handful of gated cloud communities whose proprietors control the availability of new code."[12] At times, this paranoia of

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10 LAWRENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE (1999) at 5-6.

11 WU, *supra* note 5 at 7.

12 Jonathan Zittrain, *Lost in the Cloud*, NEW YORK TIMES, July 19, 2009, **www.nytimes.com/2009/07/20/opinion/20zittrain.html**.

some in the Openness Evangelical clan borders on outright hysteria. In August 2008, a Public Knowledge analyst likened Apple's management of applications in its iPhone App Store to the tyranny of Orwell's *1984*! [13] In other words, the Big Brother they want us to fear is *Corporate* Big Brother. Someday very soon, we are repeatedly told, the corporate big boys will toss the proverbial "master switch," suffocating Internet innovation and digital freedom, and making us all cyber-slaves within their commercialized walled gardens. The possibility of consumers escaping from these walled gardens or avoiding them altogether is treated as remote—if the notion is entertained at all.

We might think of this fear as "The Great Closing," or the notion that, unless radical interventions are pursued—often through regulation—a Digital Dark Age of Closed Systems will soon unfold, complete with myriad America Online-like walled gardens, "sterile and tethered devices," corporate censorship, and gouging of consumers. Finally, the implicit message in the work of all these hyper-pessimistic critics is that markets must be steered in a more sensible direction by those technocratic philosopher kings (although the details of their blueprint for digital salvation are often scarce).

Problems with "The Great Closing" Thesis

There are serious problems with the "Great Closing" thesis as set forth in the high-tech threnody of Lessig, Zittrain, Wu, and other Openness Evangelicals, or ""as *The New York Times* has called them, digital "doomsayers."[14]

No Clear Definitions of Openness or Closedness; Both Are Matters of Degree

"Open" vs. closed isn't as black and white as some Openness Evangelicals make it out to be. For example, Zittrain praises the supposedly more open nature of PCs and the openness to innovation made possible by Microsoft's Windows operating system. How ironic, since so many have blasted Windows as the Great Satan of closed code! Meanwhile, while most others think of Apple as "everyone's favorite example of innovation,"[15] Zittrain makes the

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13 Alex Curtis, *Benefits of iPhone App Store Tainted by 1984-like Control*, Public Knowledge Blog, Aug. 11, 2008, **www.publicknowledge.org/node/1703** The tech gadget website Gizmodo recently ran a similar Apple-as-Big-Brother essay: Matt Buchanan, *Big Brother Apple and the Death of the Program*, GIZMODO, Oct. 22, 2010, **http://gizmodo.com/5670812/big-brother-apple-and-the-death-of-the-program**.

14 Eric Pfanner, *Proclaimed Dead, Web is Showing Signs of New Life*, NEW YORK TIMES, Oct. 31, 2010, **www.nytimes.com/2010/11/01/technology/01webwalls.html**

15 Amar Bhide, *Don't Expect Much From the R&D Tax Credit*, WALL STREET JOURNAL, Sept. 11, 2010, **http://online.wsj.com/article/SB10001424052748704644404575481534193344088.html**

iPhone and iPad out to be "sterile, tethered" appliances. But the company's App Store has offered millions of innovators the opportunity to produce almost every conceivable type of mobile application the human mind could imagine for those devices.[16] Moreover, those Apple devices don't block completely "open" communications applications or interfaces, such as Web browsers, email and SMS clients, or Twitter. "In the abstract," notes University of South Carolina School of Law professor Ann Bartow, "generativity and tetheredness may be opposites, but in reality they can exist within a single appliance."[17]

While the Apple devices seem to prove that, in reality, almost *all* modern digital devices and networks feature some generative and "non-generative" attributes. "No one has ever created, and no one will ever create, a system that allows any user to create anything he or she wants. Instead, every system designer makes innumerable tradeoffs and imposes countless constraints," note James Grimmelmann and Paul Ohm.[18] "Every generative technology faces … tradeoffs. Good system designers always restrict generativity of some kinds in order to encourage generativity of other kinds. The trick is in striking the balance," they argue.[19] Yet, "Zittrain never fully analyzes *split-generativity* systems, those with generative layers built upon non-generative layers, or vice-versa."[20]

The zero-sum fear that the ascendancy of mobile apps means less "generativity" or the "death of the Web" is another myth. Nick Bilton of *The New York Times* notes:

> Most of these apps and Web sites are so intertwined that it's difficult to know the difference. With the exception of downloadable games, most Web apps for news and services require pieces of the Web and Internet to function properly. So as more devices become connected to the Internet, even if they're built to access beautiful walled gardens, like mobile

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16 Apple, *Apple's App Store Downloads Top Three Billion*, Jan. 5, 2010, **www.apple.com/pr/library/2010/01/05appstore.html**

17 Ann Bartow, *A Portrait of the Internet as a Young Man*, 108 MICHIGAN LAW REVIEW 6, at 1102-03, **www.michiganlawreview.org/assets/pdfs/108/6/bartow.pdf**

18 James Grimmelmann & Paul Ohm, *Dr. Generative or: How I Learned to Stop Worrying and Love the iPhone*, MARYLAND LAW REVIEW (2010) at 940-41.

19 *Id.* at 941.

20 *Id.* at 944. (emphasis in original).

> apps or TV-specific interfaces, they will continue to access the Web too, enabling each platform to grow concurrently.[21]

Ironically, it was Chris Anderson, editor of *Wired* and author of the apocalyptic "Web is Dead" cover story, who best explained why fears of "The Great Closing" are largely overblown:

> Ecommerce continues to thrive on the Web, and no company is going to shut its Web site as an information resource. More important, the great virtue of today's Web is that so much of it is noncommercial. The wide-open Web of peer production, the so-called generative Web where everyone is free to create what they want, continues to thrive, driven by the nonmonetary incentives of expression, attention, reputation, and the like.[22]

And Jeff Bertolucci of *PC World* makes it clear generative computing is alive and well:

> The next big computing platform won't be a version of Apple's Mac OS, Google's Android, or Microsoft's Windows. It's already here—and it's the Web. And the drive to offer the most compelling window to the Web possible, via the browser, is intense. The browser is spreading beyond the PC and smartphone to new types of gadgetry, including TV set-top boxes and printers. This is a trend that will accelerate in the coming years.[23]

The Evils of Closed Systems or Digital "Appliances" Are Greatly Over-Stated

Openness Evangelicals often fail to appreciate how there obviously must have been a need / demand for some "closed" or "sterile" devices or else the market wouldn't have supplied them. Why *shouldn't* people who want a simpler or more secure digital experience be offered such options? Wu worries that devices like the iPad "are computers that have been reduced to a strictly limited set of functions that they are designed to perform extremely well."[24] Needless to say,

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21 Nick Bilton, *Is the Web Dying? It Doesn't Look That Way*, NEW YORK TIMES BITS BLOG, Aug. 17, 2010, **http://bits.blogs.nytimes.com/2010/08/17/the-growth-of-the-dying-web**

22 Anderson & Wolff, *supra* note 2.

23 Jeff Bertolucci, *Your Browser in Five Years,* PC WORLD, June 16, 2010, **www.pcworld.com/article/199071/your_browser_in_five_years.html**

24 Wu, *supra* note 5 at 292.

it will be hard for many consumers to sympathize with Wu's complaint that products work too well!

However, as noted throughout this essay, it's also not quite true that those devices are as closed or crippled as their critics suggest. As Grimmelmann and Ohm aptly note, "restricting generativity in one place (for example, by building computers with fixed circuit boards rather than a tangle of reconfigurable wires) can massively enhance generativity overall (by making computers cheap and usable enough that everyone can tinker with their software)."[25] For example, in November 2010, Damon Albarn, lead singer of the popular band "Gorillaz," announced that the group's next album would be recorded entirely on an iPad.[26]

Regardless, just how far would these critics go to keep devices or platform perfectly "generative" or "open" (assuming we can even agree on how to define these concepts)? Do the Openness Evangelicals really think consumers would be better served if they were forced to fend for themselves with devices that arrived totally unconfigured? Should the iPhone or iPad, for example, be shipped to market with no apps loaded on the main screen, forcing everyone to go find them on their own? Should TiVos have no interactive menus out-of-the-box, forcing consumers to go online and find some "homebrew" code that someone whipped up to give users an open source programming guide?

Some of us are able to do so, of course, and those of us who are tech geeks sometimes find it easy to look down our noses at those who want their hand held through cyberspace, or who favor more simplistic devices. But there's nothing wrong with those individuals who seek simplicity, stability, or security in their digital devices and online experiences—even if they find those solutions in the form of "tethered appliances" or "walled gardens." Not everyone wants to tinker or to experience cyberspace as geeks do. Not everyone wants to program their mobile phones, hack their consoles, or write their own code. Most people live perfectly happy lives without ever doing any of these things! Nonetheless, many of those "mere mortals" *will* want to use many of the same toys that the tech geeks use, or they may just want to take more cautious steps into the occasionally cold pool called cyberspace—one tippy toe at a time. Why shouldn't those users be accommodated with "lesser" devices or a "curated" Web experience? Kevin Kelly argues that there's another way of looking at these trends. Digital tools are becoming more specialized, he argues, and "with the advent of rapid fabrication … specialization will leap ahead so that any tool can be customized to an individual's personal needs or desires."[27] Viewed in

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25 Grimmelmann & Ohm, *supra* note 18, at 923.

26 *Damon Albarn Records New Gorillaz Album on an iPad*, NME NEWS, November 12, 2010, **http://www.nme.com/news/gorillaz/53816**

27 Kevin Kelly, *What Technology Wants* (2010) at 295-6.

this light, the Openness Evangelicals would hold back greater technological specialization in the name of preserving market norms or structures they prefer.

The best argument against digital appliancization is that the desire for more stable and secure systems will lead to a more "regulable" world—*i.e.*, one that can be more easily controlled by both corporations and government. As Zittrain puts it:

> Whether software developer or user, volunteering control over one's digital environment to a Manager means that the manager can change one's experience at any time—or worse, be compelled to by outside pressures. … The famously ungovernable Internet suddenly becomes much more governable, an outcome most libertarian types would be concerned about.[28]

No doubt, concerns about privacy, child safety, defamation, cybersecurity, identity theft and so on, will continue to lead to calls for more intervention. At the corporate level, however, some of that potential intervention makes a great deal of sense. For example, if ISPs are in a position to help do something to help alleviate some of these problems—especially spam and viruses—what's wrong with that? Again, there's a happy balance here that critics like Zittrain and Wu fail to appreciate. Bruce Owen, an economist and the author of *The Internet Challenge to Television*, discussed it in his response to Zittrain's recent book:

> Why does Zittrain think that overreaction is likely, and that its costs will be unusually large? Neither prediction is self-evident. Faced with the risk of infection or mishap, many users already restrain their own taste for PC-mediated adventure, or install protective software with similar effect. For the most risk-averse PC users, it may be reasonable to welcome "tethered" PCs whose suppliers compete to offer the most popular combinations of freedom and safety. Such risk-averse users are reacting, in part, to negative externalities from the poor hygiene of other users, but such users in turn create positive externalities by limiting the population of PCs vulnerable to contagion or hijacking. As far as one can tell, this can as easily produce balance or under-reaction as overreaction—it is an empirical question. But, as long as flexibility has value to users,

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[28] Jonathan Zittrain, *Has the Future of the Internet Happened*? Sept. 7, 2010, CONCURRING OPINIONS blog, **www.concurringopinions.com/archives/2010/09/has-the-future-of-the-internet-come-about.html**

> suppliers of hardware and interconnection services will have incentives to offer it, in measured ways, or as options.[29]

Indeed, we can find happy middle-ground solutions that balance openness and stability—and platform operators must be free to discover where that happy medium is through an ongoing process of trial and error, for only through such discovery can the right balance be struck in a constantly changing landscape. A world full of hybrid solutions would offer more consumers more choices that better fit their specific needs.

Finally, to the extent something more must be done to counter the supposed regulability of cyberspace, the solution should not be new limitations on innovation. Instead of imposing restrictions on code or coders to limit regulability, we should instead place more constraints on our government(s). Consider privacy and data collection concerns. While, as a general principle, it is probably wise for companies to minimize the amount of data they collect about consumers to avoid privacy concerns about data breaches, there are also benefits to the collection of that data. So rather than legislating the "right" data retention rules, we should hold companies to the promises they make about data security and breaches, and tightly limit the powers of government to access private information through intermediaries in the first place.

Most obviously, we could begin by tightening up the Electronic Communications Privacy Act (ECPA) and other laws that limit government data access.[30] More subtly, we must continue to defend Section 230 of the Communications Decency Act, which shields intermediaries from liability for information posted or published by users of their systems, because (among many things) such liability would make online intermediaries more susceptible to the kind of back-room coercion that concerns Zittrain, Lessig and others. If we're going to be legislating the Internet, we need more laws like that, not those of the "middleman deputization" model or those that would regulate code to achieve this goal.

Companies Have Strong Incentives to Strike the Right Openness/Closedness Balance

Various social and economic influences help ensure the scales won't be tipped completely in the closed or non-generative direction. The Web is built on

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29 Bruce Owen, *As Long as Flexibility Has Value to Users, Suppliers Will Have Incentives to Offer It*, BOSTON REVIEW, March/April 2008, **www.bostonreview.net/BR33.2/owen.php**

30 A broad coalition has proposed such reforms. See **www.digitaldueprocess.org**.

powerful feedback mechanisms and possesses an extraordinary level of transparency in terms of its operations.

Moreover, the breaking news cycle for tech developments can be measured not in days, but in minutes or even seconds. Every boneheaded move meets immediate and intense scrutiny by bloggers, tech press, pundits, gadget sites, *etc.* Never has the white-hot spotlight of public attention been so intense in helping to shine a light on corporate missteps and forcing their correction. We saw this dynamic at work with the Facebook Beacon incident,[31] Google' Buzz debacle,[32] Amazon *1984* incident,[33] Apple's Flash restrictions,[34] the Sony rootkit episode,[35] and other examples.

Things Are Getting More Open All the Time Anyway

Most corporate attempts to bottle up information or close off their platforms end badly. The walled gardens of the past failed miserably. In critiquing Zittrain's book, Ann Bartow has noted that "if Zittrain is correct that CompuServe and America Online (AOL) exemplify the evils of tethering, it's pretty clear the market punished those entities pretty harshly without Internet governance-style interventions."[36] Indeed, let's not forget that AOL was the big, bad corporate boogeyman of Lessig's *Code* and yet, just a decade later, it has been relegated to an also-ran in the Internet ecosystem.

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31 *See* Nancy Gohring, *Facebook Faces Class-Action Suit Over Beacon*, NETWORKWORLD.COM, Aug. 13, 2008, **http://www.networkworld.com/news/2008/081308-facebook-faces-class-action-suit-over.html**.

32 *See* Ryan Paul, *EPIC Fail: Google Faces FTC Complaint Over Buzz Privacy*, ARS TECHNICA, Feb. 17, 2010, **http://arstechnica.com/security/news/2010/02/epic-fail-google-faces-complaint-over-buzz-privacy-issues.ars**.

33 *See* John Timmer, *Amazon Settles 1984 Suit, Sets Limits on Kindle Deletions*, ARS TECHNICA, Oct. 2, 2009, **http://arstechnica.com/web/news/2009/10/amazon-stipulates-terms-of-book-deletion-via-1984-settlement.ars**.

34 *See* Rob Pegoraro, *Apple Ipad's Rejection of Adobe Flash Could Signal the Player's Death Knell*, THE WASHINGTON POST, Feb. 7, 2010, **http://www.washingtonpost.com/wp-dyn/content/article/2010/02/05/AR2010020501089.html**.

35 *See* Wikipedia, *Sony BMG CD Copy Protection Scandal,* **http://en.wikipedia.org/wiki/Sony_BMG_CD_copy_protection_scandal** (last accessed Dec. 9, 2010).

36 Bartow, *supra* note 17 at 1088, **www.michiganlawreview.org/assets/pdfs/108/6/bartow.pdf**

The America Online Case Study:
Remembering Yesterday's Face of "Closed" Evil

When it comes to "closed" systems, evil has a face, but it seems the face is always changing. When Lessig penned *Code* a decade ago, it was American Online (AOL) that was set to become the corporate enslaver of cyberspace. For a time, it was easy to see why Lessig and others might have been worried. Twenty five million subscribers were willing to pay $20 per month to get a guided tour of AOL's walled garden version of the Internet. Then AOL and Time Warner announced a historic mega-merger that had some predicting the rise of "new totalitarianisms"[37] and corporate "Big Brother."[38]

But the deal quickly went off the rails.[39] By April 2002, just two years after the deal was struck, AOL-Time Warner had already reported a staggering $54 billion loss.[40] By January 2003, losses had grown to $99 billion.[41] By September 2003, Time Warner decided to drop AOL from its name altogether and the deal continued to slowly unravel from there.[42] In a 2006 interview with the *Wall Street Journal*, Time Warner President Jeffrey Bewkes famously declared the death of "synergy" and went so far as to call synergy "bullsh*t"![43] In early 2008, Time Warner decided to shed AOL's dial-up service[44] and in 2009 spun off AOL entirely.[45] Further deconsolidation followed for Time Warner, which

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37 Norman Soloman, *AOL Time Warner: Calling The Faithful To Their Knees*, Jan. 2000, **www.fair.org/media-beat/000113.html**

38 Robert Scheer, *Confessions of an E-Columnist*, Jan. 14, 2000, ONLINE JOURNALISM REVIEW, **www.ojr.org/ojr/workplace/1017966109.php**

39 Adam Thierer, *A Brief History of Media Merger Hysteria: From AOL-Time Warner to Comcast-NBC*, Progress & Freedom Foundation, PROGRESS ON POINT 16.25, Dec. 2, 2009, **www.pff.org/issues-pubs/pops/2009/pop16.25-comcast-NBC-merger-madness.pdf**

40 Frank Pellegrini, *What AOL Time Warner's $54 Billion Loss Means*, April 25, 2002, TIME ONLINE, **www.time.com/time/business/article/0,8599,233436,00.html**

41 Jim Hu, *AOL Loses Ted Turner and $99 billion,* CNET NEWS.COM, Jan. 30, 2004, **http://news.cnet.com/AOL-loses-Ted-Turner-and-99-billion/2100-1023_3-982648.html**

42 *Id.*

43 Matthew Karnitschnig, *After Years of Pushing Synergy, Time Warner Inc. Says Enough*, WALL STREET JOURNAL, June 2, 2006, **http://online.wsj.com/article/SB114921801650969574.html**

44 Geraldine Fabrikant, Time Warner Plans to Split Off AOL's Dial-Up Service, NEW YORK TIMES, Feb. 7, 2008, **www.nytimes.com/2008/02/07/business/07warner.html?_r=1&adxnnl=1&oref=slogin&adxnnlx=1209654030-ZpEGB/n3jS5TGHX63DONHg**

45 Press Release, Time Warner, Time Warner Inc. Completes Spin-off of AOL Inc. (Dec. 10, 2009), **http://www.timewarner.com/corp/newsroom/pr/0,20812,1946835,00.html**.

spun off its cable TV unit and various other properties. Looking back at the deal, Fortune magazine senior editor at large Allan Sloan called it the "turkey of the decade."[46]

In the larger scheme of things, AOL's story has already become an afterthought in our chaotic cyber-history. But we shouldn't let those old critics forget about their lugubrious lamentations. To recap: the big, bad corporate villain of Lessig's *Code* attempted to construct the largest walled garden ever, and partner with a titan of the media sector in doing so—*and this dastardly plot failed miserably.*

The hysteria about AOL's looming monopolization of instant messaging—and with it, the rest of the Web—seems particularly silly: Today, anyone can download a free chat client like Digsby or Adium to manage multiple IM services from AOL, Yahoo!, Google, Facebook and just about anyone else, all within a single interface, essentially making it irrelevant which chat service your friends use.

From this case study one would think the Openness Evangelicals would have gained a newfound appreciation for the evolutionary and dynamic nature of digital markets and come to understand that, in markets built upon code, the pace and nature of change is unrelenting and utterly unpredictable. Indeed, *contra* Lessig's lament in *Code* that "Left to itself, cyberspace will become a perfect tool of control," cyberspace has proven far more difficult to "control" or regulate than any of us ever imagined. The volume and pace of technological innovation we have witnessed over the past decade has been nothing short of stunning.

Critics like Zittrain and Wu, however, wants to keep beating the cyber-sourpuss drum. So, the face of corporate evil had to change. Today, Steve Jobs has become the supposed apotheosis of all this closed-system evil instead of AOL. Jobs serves as a prime villain in the books of Zittrain and Wu and in many of the essays they and other Openness Evangelicals pen. It's worth noting, however, that their enemies list is growing longer and now reads like a "Who's Who" of high-tech corporate America. According to Zittrain and Wu's books, 'we need to worry about just about every major player in the high-tech ecosystem—telcos, cable companies, wireless operators, entertainment providers, Facebook, and others.

Even Google—Silicon Valley's supposed savior of Internet openness—is not spared their scorn. "Google is the Internet's switch," Wu argues. "In fact, it's

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46 Allan Sloan, *'Cash for…' and the Year's Other Clunkers*, WASHINGTON POST, Nov. 17, 2009, **www.washingtonpost.com/wp-dyn/content/article/2009/11/16/AR2009111603775.html**

the world's most popular Internet switch, and as such, it might even be described as the current custodian of the Master Switch." More ominously, he warns, "it is the switch that transforms mere communications into networking—that ultimately decides who reaches what or whom."[47]

It seems, then, that the face of "closed" evil is constantly morphing. Shouldn't that tell us something about how dynamic these markets are?

There are few reasons to believe that today's efforts to build such walled gardens would end much differently. Indeed, increasingly when companies or coders erect walls of any sort, holes form quickly. For example, it usually doesn't take long for a determined group of hackers to find ways around copy/security protections and "root" or "jailbreak" phones and other devices.[48] Once hacked, users are usually then able to configure their devices or applications however they wish, effectively thumbing their noses at the developers. This process tends to unfold in a matter of just days, even hours, after the release of a new device or operating system.

Number of Days Before New Devices Were "Rooted" or "Jailbroken"[49]

original iPhone	10 days
original iPod Touch	35 days
iPhone 3G	8 days
iPhone 3GS	1 day
iPhone 4	38 days
iPad	1 day
T-Mobile G1 (first Android phone)	13 days
Palm Pre	8 days

Of course, not every user will make the effort—or take the risk[50]—to hack their devices in this fashion, even once instructions are widely available for doing so.

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47 Wu, *supra* note 5 at 280.

48 "In living proof that as long as there's a thriving geek fan culture for a device, it will never be long for the new version to be jailbroken: behold iOS 4.1. Most people are perfectly willing to let their devices do the talking for them, accept what's given, and just run sanctioned software. But there are those intrepid few—who actually make up a fairly notable portion of the market—who want more out of their devices and find ways around the handicaps built into them by the manufacturers." Kit Dotson, *New iOS for Apple TV Firmware Released, Promptly Decrypted*, SiliconAngle, Sept. 28, 2010, **http://siliconangle.com/blog/2010/09/28/new-ios-for-apple-tv-firmware-released-promptly-decrypted**

49 Original research conducted by author and Adam Marcus based on news reports.

Nonetheless, even if copyright law might sometimes seek to restrict it, the hacking option still exists for those who wish to exercise it. Moreover, because many manufacturers know their devices are likely to be hacked, they are increasingly willing to make them more "open" right out of the gates or offer more functionality/flexibility to make users happy.

Innovation Continues to Unfold Rapidly *in Both Directions* along the "Open" vs. "Closed" Continuum

As noted above, part of Zittrain and Wu's lament seems to be that the devices that the *hoi polloi* choose might crowd out those favored by tinker-happy tech geeks (of which I count myself a proud member). But we geeks need not fear such foreclosure. Just because there are some "closed" systems or devices on the market, it doesn't mean innovation has been foreclosed among more "open" systems or platforms. A hybrid future is both possible and desirable. Again, we can have the best of both worlds—a world full of plenty of closed systems or even "tethered appliances," but also plenty of generativity and openness. As Web 2.0 pioneer Tim O'Reilly notes:

> I'm not terribly taken in by the rhetoric that says that because content silos are going up, and we're seeing more paid content, the open web is over. Individuals, small companies, entrepreneurs, artists, all have enormous ability to share and distribute their work and find an audience. I don't see that becoming less in today's environment.[51]

Consider the battle between the Apple iPhone and Google Android mobile phone operating systems. Zittrain says Android is "a sort of canary in the coal mine"[52] for open platforms, but ignores the frantic pace of its growth, now accounting for one-quarter of mobile Web traffic just three years after its inception[53] and stealing away Apple's marketshare in the process.[54] Beyond

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50 Rooting or jailbreaking a smartphone creates the risk of "bricking" the device—rendering it completely inoperable (and thus no more useful than a brick). Additionally, hacking devices in this fashion typically voids any manufacturer warranty.

51 *The Web is Dead? A Debate*, WIRED, Aug. 17, 2010, **www.wired.com/magazine/2010/08/ff_webrip_debate/all/1**

52 Jonathan Zittrain, *Has the Future of the Internet Happened?* Sept. 7, 2010, CONCURRING OPINIONS blog, **www.concurringopinions.com/archives/2010/09/has-the-future-of-the-internet-come-about.html**

53 Sean Hollister, *Android Accounts for One-Quarter of Mobile Web Traffic, Says Quantcast*, ENGADGET, Sept. 4, 2010, **www.engadget.com/2010/09/04/android-accounts-for-one-quarter-of-mobile-web-traffic-says-qua**; *Android Most Popular Operating System in U.S.*

downplaying Android's success as a marketplace triumph for openness (and proof of the non-governmental forces that work to force a balance between openness and closedness), Zittrain also reverts to the "kill switch" boogeyman: He warns us that any day now Google could change its mind, close the Android platform, and "kill an app, or the entire phone" remotely.[55] But where's the business sense in that? What's the incentive for Google to pursue such a course of action? Would Google be able to produce all those millions of apps currently produced by independent developers? That seems both unlikely and unpopular. Meanwhile, how many times has supposedly control-minded Apple actually thrown the dreaded "kill switch" on apps? There are tens of millions of apps in Apple's App Store and hundreds of billions of downloads. If Steve Jobs is supposed to be the great villain of independent innovation, he seems to be doing a pretty bad job at it! "The App Store is, by some estimates, now a multi-billion-dollar-a-year business," note Grimmelmann and Ohm.[56] "The iPhone is a hotbed of creative tinkering; people are doing amazing things with it."[57]

In fact, Wu admits Apple's App Store offers a "seemingly unlimited variety of functions" and that "Apple does allow outsiders to develop applications on its platform" since "the defeat of the Macintosh by Windows taught Jobs that a platform completely closed to outside developers is suicide."[58] That should be the end of the story. Yet Wu's fear of that big proverbial "kill switch" overrides all: Any day now, that switch will be thrown and Lessig's pessimistic predictions of "perfect control" will finally come to pass, he implies. As Wu says, "all innovation and functionality are ultimately subject to Apple's veto."[59] And consider the lament of Tom Conlon of *Popular Science*: "Once we replace the personal computer with a closed-platform device such as the iPad, we replace

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Among Recent Smartphone Buyers, NIELSEN WIRE, Oct. 5, 2010, **http://blog.nielsen.com/nielsenwire/online_mobile/android-most-popular-operating-system-in-u-s-among-recent-smartphone-buyers**

54 Tricia Duryee, *Apple Continued To Lose U.S. Marketshare Despite Spike From iPhone 4 Sales*, MOCONEWS.NET, Sept. 15, 2010, **http://moconews.net/article/419-apple-continued-to-lose-u.s.-marketshare-despite-spike-from-iphone-4-sa**; Miguel Helft, The iPhone Has a Real Fight on Its Hands, NEW YORK TIMES BITS, Oct. 5, 2010, **http://bits.blogs.nytimes.com/2010/10/05/the-iphone-has-a-real-fight-on-its-hands/**

55 Jonathan Zittrain, *Has the Future of the Internet Happened?* Sept. 7, 2010, CONCURRING OPINIONS blog, **www.concurringopinions.com/archives/2010/09/has-the-future-of-the-internet-come-about.html**

56 Grimmelmann & Ohm, *supra* note 18 at 923.

57 *Id.*

58 Wu, *supra* note 5 at 292.

59 *Id.*

freedom, choice, and the free market with oppression, censorship, and monopoly."[60] But Apple is hardly the only game in town, and each time Apple creates a new product category (iPod, iPhone, iPad, *etc.*), other companies are quick to follow with their own, usually more open systems, often running Google's Android operating system.

Neither Wu nor Zittrain, however, spend much time investigating how often their proverbial kill switch is actually thrown—by Apple or anyone else. There have been a handful of examples, but those are hardly the rule. The *vast* majority of all applications are immediately accepted and offered on the platform. Moreover, if they *were* blocked, they could quickly be found on other platforms. Again, there are plenty of alternatives to Apple products if you don't like their (somewhat) more restrictive policies regarding application development.

Bottom line: Today's supposed "walled gardens" are less "walled" than ever before, and "closed" systems aren't really so closed.

The Internet Was Never Quite So Open or Generative

At times, Zittrain and others seem to have created an Internet imago; an idealized conception of a supposed better time when cyberspace was more open and vibrant. But let's face it, the "good ol' days" that many Openness Evangelicals seem to be longing for weren't really so glorious. Were you online back in 1994? Did you enjoy Trumpet Winsock and noisy 14.4 baud modems? Did you like loading up multiple 5¼-inch floppy disks just to boot your machine? Needless to say, most of us don't miss those days.

Here's the other forgotten factor about the Net's early history: Until the Net was commercialized, it was an extremely closed system. As Geert Lovink reminds us:

> [In] [t]he first decades[,] the Internet was a closed world, only accessible to (Western) academics and the U.S. military. In order to access the Internet one had to be an academic computer scientist or a physicist. Until the early nineties it was not possible for ordinary citizens, artists, business[es] or activists, in the USA or elsewhere, to obtain an email address

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60 Tom Conlon, *The iPad's Closed System: Sometimes I Hate Being Right*, POPULAR SCIENCE, Jan. 29, 2010, **www.popsci.com/gadgets/article/2010-01/ipad%E2%80%99s-closed-system-sometimes-i-hate-being-right**

> and make use of the rudimentary UNIX-based applications. …
> It was a network of networks—but still a closed one.[61]

Ironically, it was only because Lessig and Zittrain's much-dreaded AOL and CompuServe came along that many folks were even able to experience and enjoy this strange new world called the Internet. "The fact that millions of Americans for the first time experienced the Internet through services like AOL (and continue to do so) is a reality that Zittrain simply overlooks," notes Lovink.[62] Could it be that those glorious "good ol' days" Zittrain longs for were really due to the way closed "walled gardens" like AOL and CompuServe held our hands to some extent and gave many new Netizens a guided tour of cyberspace?

Regardless, we need not revisit or reconsider that history. That's ancient history now because the walls around those gardens came crumbling down.

Summary

When you peel away all the techno-talk and hand-wringing, what Zittrain and other Openness Evangelicals object to is the fact that some people are making choices that they don't approve of. To be generous, perhaps it's because they believe that the "mere mortals" don't fully understand the supposed dangers of the choices they are making. But my contention here has been that things just aren't as bad as they make them out to be. More pointedly, who are these critics to say those choices are irrational?

Again, so what if some mere mortals choose more "closed" devices or platforms because they require less tinkering and "just work?" It isn't the end of the world. Those devices or platforms aren't really as closed as they suggests—in fact, they are far more open in some ways that the earlier technologies and platforms Zittrain, *et.al.* glorify. And it simply doesn't follow that just because *some* consumers choose to use "appliances" that it's the end of the generative devices that others so cherish. "General-purpose computers are so useful that we're not likely to abandon them," notes Princeton University computer science professor Ed Felten.[63] For example, a October 2010 NPD Group survey

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61 Geert Lovink, *Zittrain's Foundational Myth of the Open Internet*, NET CRITIQUE BY GEERT LOVINK, Oct. 12, 2008, **http://networkcultures.org/wpmu/geert/2008/10/12/zittrains-foundational-myth-of-the-open-internet/**

62 *Id.*

63 Ed Felten, *iPad to Test Zittrain's "Future of the Internet" Thesis*, FREEDOM TO TINKER blog, Feb. 4, 2010, **www.freedom-to-tinker.com/blog/felten/ipad-test-zittrains-future-internet-thesis**

revealed that "contrary to popular belief, the iPad isn't causing cannibalization in the PC market because iPad owners don't exhibit the same buying and ownership patterns as the typical consumer electronics customer."[64] According to NPD, only 13% of iPad owners surveyed bought an iPad instead of a PC, while 24% replaced a planned e-reader purchase with an iPad. Thus, to the extent the iPad was replacing anything, it would be other "non-generative" devices like e-readers.

In a similar vein, James Watters, Senior Manager of Cloud Solutions Development at VMware, argues:

> Innovation will be alive and well because the fundamental technologies at the core of cloud computing are designed for massive, vibrant, explosive, awesome, and amazing application innovation. There will always be a big place in the market for companies who achieve design simplicity by limiting what can be done on their platforms—Apple and Facebook may march to massive market share by this principle—but as long as the technologies underpinning the network are open, programmable, extensible, modular, and dynamic as they are and will be, innovation is in good hands.[65]

Thus, we *can* have the best of both worlds—a world full of plenty of "tethered" appliances, but also plenty of generativity and openness. We need not make a choice between the two, and we certainly shouldn't be demanding someone else make it for us.

Against the Stasis Mentality & Static Snapshots

There are some important practical questions that the Openness Evangelicals often fail to acknowledge in their work. Beyond the thorny question of how to define "openness" and "generativity," what metric should be used when existing yardsticks become obsolete so regularly?

This points to two major failings in the work of all the cyber-collectivists—Lessig in *Code*, Zittrain in *Future of the Internet*, and Wu in *The Master Switch*:

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64 *Nearly 90 Percent of Initial iPad Sales are Incremental and not Cannibalizing the PC Market, According to NPD,* NPD Group PRESS RELEASE, October 1, 2010, **www.npd.com/press/releases/press_101001.html**

65 James Watters, *NYT Kicks Off Cloud Paranoia Series*, SILICONANGLE blog, July 21, 2009, **http://siliconangle.com/blog/2009/07/21/nyt-kicks-off-cloud-paranoia-editorial-series**

1. They have a tendency to adopt a static, snapshot view of markets and innovation; and,

2. They often express an overly nostalgic view of the past (without making it clear when the "good 'old days" began and ended) while adopting an excessively pessimist view of the present and the chances for progress in the future.

This is what Virginia Postrel was referring to in *The Future and Its Enemies* when she criticized the stasis mentality because "It overvalues the tastes of an articulate elite, compares the real world of trade-offs to fantasies of utopia, omits important details and connections, and confuses temporary growing pains with permanent catastrophes."[66] And it is what economist Israel Kirzner was speaking of when warned of "the shortsightedness of those who, not recognizing the open-ended character of entrepreneurial discovery, repeatedly fall into the trap of forecasting the future against the background of *today's* expectations rather than against the unknowable background of tomorrow's discoveries."[67]

Indeed, there seems to be a complete lack of appreciation among the Openness Evangelicals for just how rapid and unpredictable the pace of change in the digital realm has been and will likely continue to be. The relentlessness and intensity of technological disruption in the digital economy is truly unprecedented but often under-appreciated. We've had multiple mini-industrial revolutions within the digital ecosystem over the past 15 years. Again, this is "evolutionary dynamism" at work. (Actually, it's more like *revolutionary* dynamism!) Nothing—*absolutely nothing*—that was sitting on our desks in 1995 is still there today (in terms of digital hardware and software). It's unlikely that much of what was on our desk in *2005* is still there either—with the possible exception of some crusty desktop computers running Windows XP. Thus, at a minimum, analysts of innovation in this space "should … extend the time horizon for our assessment of the generative ecosystem"[68] to ensure they are not guilty of the static snapshot problem.

Speaking of Windows, it perfectly illustrates the complexity of defining generative systems. Compare the half-life of Windows PC operating systems—which Zittrain indirectly glorifies in his book as generativity nirvana—to the half-life of Android operating systems. Both Apple and Android-based devices

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66 VIRGINIA POSTREL, THE FUTURE AND ITS ENEMIES (1998), at xvii-xviii.

67 ISRAEL KIRZNER, DISCOVERY AND THE CAPITALIST PROCESS (University of Chicago Press, 1985), at xi.

68 Grimmelmann & Ohm, *supra* note 18 at 947.

have seen multiple OS upgrades since release. Some application developers actually complain about this frantic pace of mobile OS "revolutions," especially with the Android OS, since they must deal with multiple devices and OS versions instead of just one Apple iPhone. They'd rather see more OS consistency among the Android devices for which they're developing to facilitate quicker and more stable rollouts. They also have to consider whether and how to develop the same app for several other competing platforms.

Meanwhile, Windows has offered a more "stable" developing platform for developers because Microsoft rolls out OS upgrades at a much slower pace. Should we should consider an OS with a slower upgrade trajectory more "generative" than an OS that experiences constant upgrades if, in practice, the former allows for more "open" (and potentially rapid) independent innovation by third parties? Of course, there other factors that play into the "generativity" equation,[69] but it would be no small irony to place the Windows PC model on the higher pedestal of generativity than the more rapidly-evolving mobile OS ecosystem.

Conclusion: Toward Evolutionary Dynamism & Technological Agnosticism

Whether we are debating where various devices sit on a generativity continuum (of "open" versus "closed" systems), or what fits where on a "code failure" continuum (of "perfect code" versus "market failure"), the key point is that *the continuum itself is constantly evolving* and that this evolution is taking place at a much faster clip in this arena than it does in other markets. Coders don't sit still. People innovate around "failure." Indeed, "market failure" is really just the glass-is-half-empty view of a golden opportunity for innovation. Markets evolve. New ideas, innovations, and companies are born. Things generally change for the better—and do so rapidly.

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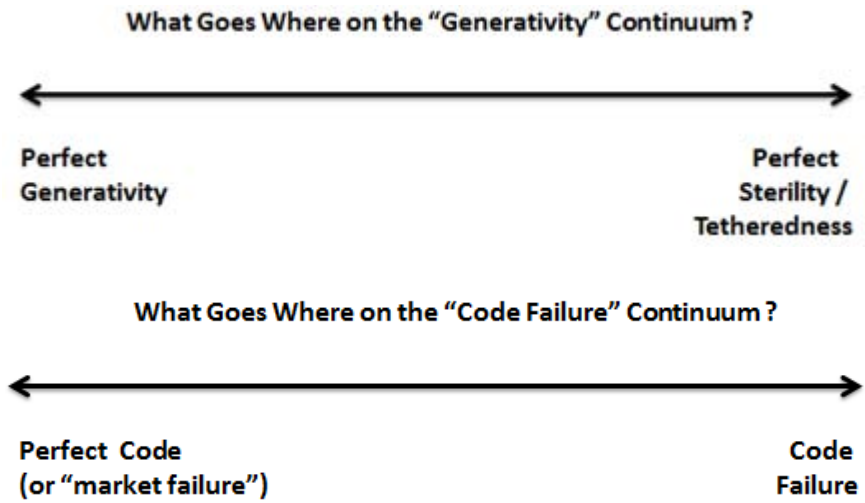
[69] "[G]enerativity is essential but can never be absolute. No technological system is perfectly generative at all levels, for all users, forever. Tradeoffs are inevitable." Grimmelmann and Ohm, *supra* note 18 at 923.



In light of the radical revolutions constantly unfolding in this space and upending existing models, it's vitally important we avoid "defining down" market failure. This is not based on a blind faith in free markets, but rather a profound appreciation for the fact that *in markets built upon code, the pace and nature of change is unrelenting and utterly unpredictable*. *Contra* Lessig's lament in *Code* that "Left to itself, cyberspace will become a perfect tool of control"—cyberspace has proven far more difficult to "control" or regulate than any of us ever imagined. Again, the volume and pace of technological innovation we have witnessed over the past decade has been nothing short of stunning.

We need to give evolutionary dynamism a chance. Sometimes it's during what appears to be a given sector's darkest hour that the most exciting things are happening within it—as the AOL case study illustrates. It's easy to forget all the anxiety surrounding AOL and its "market power" circa 1999-2002, when scholars like Lessig predicted that the company's walled garden approach would eventually spread and become the norm for cyberspace. As made clear in the breakout above, however, the exact opposite proved to be the case. The critics said the sky would fall, but it most certainly did not.

Similarly, in the late 1990s, many critics—including governments both here and in the EU—claimed that Microsoft dominated the browser market. Dour predictions of perpetual Internet Explorer lock-in followed. For a short time, there was some truth to this. But innovators weren't just sitting still; exciting things were happening. In particular, the seeds were being planted for the rise of Firefox and Chrome as robust challengers to IE's dominance—not to mention mobile browsers. Of course, it's true that roughly half of all websurfers

still use a version of IE today. But IE's share of the market is falling rapidly[70] as viable, impressive alternatives now exist and innovation among these competitors is more vibrant than ever.[71] That's all that counts. The world changed, and for the better, despite all the doomsday predictions we heard less than a decade ago about Microsoft's potential dominance of cyberspace. Moreover, all the innovation taking place at the browser layer today certainly undercuts the gloomy "death of the Net" thesis set forth by Zittrain and others. Thus, as O'Reilly argues, this case study again shows us the power of open systems and evolutionary dynamism:

> Just as Microsoft appeared to have everything locked down in the PC industry, the open Internet restarted the game, away from what everyone thought was the main action. I guarantee that if anyone gets a lock on the mobile Internet, the same thing will happen. We'll be surprised by the innovation that starts happening somewhere else, out on the free edges. And that free edge will eventually become the new center, because open is where innovation happens. […] it's far too early to call the open web dead, just because some big media companies are excited about the app ecosystem. I predict that those same big media companies are going to get their clocks cleaned by small innovators, just as they did on the web.[72]

In sum, history counsels patience and humility in the face of radical uncertainty and unprecedented change. More generally, it counsels what we might call "technological agnosticism." We should avoid declaring "openness" a sacrosanct principle and making everything else subservient to it without regard to cost or consumer desires. As Anderson notes, "there are many Web triumphalists who still believe that there is only One True Way, and will fight to the death to preserve the open, searchable common platform that the Web represented for most of its first two decades (before Apple and Facebook, to name two, decided that there were Other Ways)."[73] The better position is one based on a general agnosticism regarding the nature of technological platforms and change. In this view, the spontaneous evolution of markets has value in its

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70 Tim Stevens, *Internet Explorer Falls Below 50 Percent Global Marketshare, Chrome Usage Triples*, ENGADGET, Oct. 5, 2010, **www.engadget.com/2010/10/05/internet-explorer-falls-below-50-percent-global-marketshare-chr**

71 Nick Wingfield & Don Clark, *Browsers Get a Face-Lift*, WALL STREET JOURNAL, Sept. 15, 2010, **http://online.wsj.com/article/SB10001424052748704285104575492102514582856.html**

72 *The Web is Dead? A Debate*, WIRED, Aug. 17, 2010, **www.wired.com/magazine/2010/08/ff_webrip_debate/all/1**

73 *Id.*

own right, and continued experimentation with new models—be they "open" or "closed," "generative" or "tethered"—should be permitted.

Importantly, one need not believe that the markets in code are "perfectly competitive" to accept that they are "competitive *enough*" compared to the alternatives—especially those re-shaped by regulation. "Code failures" are ultimately better addressed by voluntary, spontaneous, bottom-up, marketplace responses than by coerced, top-down, governmental solutions. Moreover, the decisive advantage of the market-driven, evolutionary approach to correcting code failure comes down to the rapidity and nimbleness of those responses.

Let's give those other forces—alternative platforms, new innovators, social norms, public pressure, *etc.*—a chance to work some magic. Evolution happens, if you let it.