

A LEVER LONG ENOUGH: Value driven enterprise in the networked information economy

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Abstract

Today's networked information economy makes possible new forms of non-market, non-corporate activity such as Open Source software development. But Open Source software is just one example of a significant new means of value creation, using an open development model for

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decentralized, commons-based peer production. With transaction costs for information being driven towards zero, opportunities for online peer production are increasing. However, novel means alone do not explain the growth of collaborative service projects. By examining the motivations of peer producers and open development project leaders, we begin to see the outline of an alternative, post-capitalist economic vision with self-sustaining, collaborative, value-driven enterprises working alongside profit-driven markets and firms. This

article discusses how networked peer production, combined with the ethos of open standards/open development, provides a powerful new means to amplify and sustain value-driven enterprise for the benefit of society.

Networked Peer Production

"Five-thousand people were given paint-stirring sticks, and on the top of the stick was a card, one side of it reflective green and the other side was reflective red. At the front of the theater, there was a [video] camera, mapping that red and green pixel for pixel onto a huge display... when people turned their wands they would change the color of their pixel, but there were five-thousand pixels, so you literally weren't able to find yourself... [W]ithin five minutes the audience was collectively playing a game of Pong by moving a red paddle up and down through a sea of green. It defied any notion of how one might actually go about managing that many people to do a collective activity. By the end of the half-an-hour the audience was flying a flight simulator."

Brenda Laurel¹, describing an experiment by Loren Carpenter called Cinematrix done at SIGGRAPH '93, an international computer graphics conference and trade show.

We have all heard of Open Source software. Much has been written about it in this very forum. Its ubiquity, less often noted, is remarkable:

- 69% of all Web sites run on Apache software (as compared to Microsoft's 23%)²
- 30% of the servers on which those sites run use the Linux operating system (Microsoft has 50% of the market, but Linux use is growing much faster, at about 50% annual growth rate according to IDC's Q3 2003 Worldwide Quarterly Server Tracker³
- 88% of Secure Shell (SSH) implementations, used to connect securely to remote computers, over the Internet are OpenSSH, up from 5% in 2000 and 50% in 2001⁴.
- A February, 2004 Forrester Research survey found that almost 50% of businesses questioned already use open source software⁵.

There are many other examples. Most significantly, according to CMP TSG/Insight, 41% of all development tools used are open source⁶. Thus, open source serves as its own network-enabled bootstrapping technology.

Open Source software, however, is only one, and not even the most significant, manifestation of what Yale Law professor Yochai Benkler calls "*commons-based peer production*," a networked

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model of economic production that is not organized in either markets or businesses—as virtually all other economic activity is and always has been in capitalist societies. Peer production on the Internet has enabled distributed masses of people to share open production of complex products and services, largely for no financial compensation.

While the idea of non-market, non-corporate production is not new—science has traditionally worked this way—large-scale, decentralized, sustained open production by diverse groups of peers on a wide variety of focused

projects is a new phenomenon that has been enabled and encouraged by the confluence of computers, networking, and the information economy.

Non-market peer production has been used to:

- ***Create a world-class encyclopedia:*** Wikipedia is a peer-edited, open development online encyclopedia. As of September, 2004, in less than four years since its inception, Wikipedia has grown to include over 350,000 high-quality articles in English and over 650,000 in other languages (Britannica has only 85,000 articles online), with over 25,000 contributors. In the past six months alone, Wikipedia has grown by more than 50%.
- ***Develop a superior Internet directory:*** The Open Directory Project (ODP), a 65,000-person human-edited directory of the Web, is a peer-production alternative to the Yahoo! Directory. As of this writing, ODP has categorized more than four million websites in nearly 600,000 categories. ODP's consistent quality is such that it now powers the core directory services for many of the Web's biggest search portals, including Lycos, HotBot, AOL Search, and Google.
- ***Publish major news sites:*** OhmyNews is a leading news outlet in South Korea. Its unusual power derives from its unique open editing system, which makes "every citizen a reporter", currently including more than 33,000 citizen-reporters a day. In the US, open production projects like Slashdot, Kuro5hin, and Indymedia engage hundreds of thousands of

participants in the production, editing, and peer-review of breaking news, opinion, and analysis.

- **Empower grass-roots organizing:** CivicSpace, developed by the creators of DeanSpace, the community site which powered Howard Dean's presidential campaign, allows anyone to utilize sophisticated community-organizing tools for free.
- **And even map craters on Mars:** The Clickworks project was an experiment run by NASA (now concluded) that allowed 85,000 people to collaborate on mapping Mars craters. When NASA did an analysis comparing the work performed by the Internet volunteers to the mapping previously done by trained PhDs, they described the outcomes as "practically indistinguishable."

According to capitalist economics, not-for-profit, commons-based peer production should not be happening—at least not on this scale, producing this degree of consistent quality, in such a diversity of fields. This new dynamic in the marketplace, and the reasons for its growing

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economic and social significance, stem from the ways new technologies have changed the capitalist "rules of the game."

Markets and Firms

Until recently, virtually all economic activity in our capitalist system was centered on the generation of profit. There have been two practical ways to engage in economic activity: sell something for more than you paid for it, or make something

and sell it for more than it cost to make. In turn, there have been two ways to organize the exchanges that enable economic activity: *markets* and *firms* (hierarchical corporations).

In 1937, economist Ronald Coase⁷ identified *transaction costs* as the engine behind the formation of capitalist enterprises. When the transaction cost of a given exchange of goods can be lowered through an intermediary below its natural cost in the marketplace, an opportunity is created for a capitalist enterprise. Conversely, when the open market is more efficient in terms of transaction costs, a corporate intermediary ceases to be viable.

As Prof. Benkler has observed,

The result was that most individuals lived their productive life as part of corporate organizations, with relatively limited control over how, what, or when they produced; and these organizations, in turn, interacted with each other largely through markets. We came to live much of the rest of our lives selecting from menus of goods, heavily advertised to us to try to fit our consumption habits to the decisions that managers had made about investment in product lines.⁸

Then came the information economy, computers, and, most recently, networking.

Information

There are two radical ways in which information behaves differently than physical property, which used to form the core of our economy. These are: A) *the marginal cost of production is zero* (once information is produced, it costs essentially nothing for one individual to transfer it to another), and B) *the input, or raw material (information), is of the same nature as the output (new information)*.

As Prof. Lawrence Lessig points out, “*The crucial feature of this new space is the low cost of digital creation, and the low costs of delivering what gets created.*”⁹

Computing Power

While there has been some debate as to the precision of Moore’s Law (Does processing power double every year? Two years? Eighteen months? Will the pace continue?), the principle articulated is merely a special case of a more profound and important phenomenon in technological evolution. R. Buckminster Fuller¹⁰ identified this evolution in the 1920s—the trend of “*progressive ephemeralization,*” or doing more and more with less and less. What this means in practical terms is that computers and network technology, the key mediums for production and distribution of information, continue to become increasingly accessible at progressively lower cost to more and more people. The potential pool for peer production is rapidly expanding.

Network Technology

Networks themselves have characteristics that make them economically unique. The now familiar Metcalfe’s law states that *the value of a communication system grows at approximately the square of the number of users of the system*¹¹. This means that, in defiance of the classic laws of supply and demand, the more ubiquitous and accessible a network is, the greater its value becomes.

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The combination of ephemeralization and Metcalfe’s law has a determinant effect on the utility of hierarchical corporations as a vehicle for economic activity, because *they push the trend of transaction costs for information exchange towards zero*. This trend does not favor corporate solutions. And yet, certain forms of information production require the kind of collective effort of many people that corporations traditionally afford. This creates a growing opportunity vacuum that peer production enterprises increasingly fill.

Group-Forming Networks

That alone, however, is insufficient to explain the explosion of not-for-profit peer production projects in recent years. Less well known than Metcalfe’s law, but of even greater significance, is David P. Reed’s Law of Group-Forming Networks (GFNs).¹² Group-forming networks are networks like the Internet that support the development of sub-communities, affiliating sub-groupings of network members, enabled by many-to-many communication tools like email lists, discussions forums, Weblogs, and chat. Reed has found that *the utility of large-networks, particularly social networks like the Internet, can scale exponentially with the size of the network*. If the

value of physical networks grows at a rate of n^2 , the value of GFNs grows at the accelerating rate of 2^n .

This confluence of new conditions enables peer production to emerge as a significant alternative to the traditional market/firm system, when productive activity is not best served by that system.

It still does not explain, however, *why* people choose to participate in such activity. There is largely no profit in it, there is often no fame in it (major projects like Apache don't even credit individual contributors.) While most Open Source coders are motivated by the sheer pleasure of tackling complex technical challenges, that doesn't quite explain why masses of people voluntarily participate in a rather tedious process like Distributed Proofreaders, created independently to support Project Gutenberg.

Project Gutenberg is a peer production effort to digitize public domain books. Volunteers manually enter the text of a book, and other volunteers proofread it for accuracy. Distributed Proofreaders breaks down works entered by Project Gutenberg participants into individual pages, which are then randomly assigned to volunteers who sign up at the Distributed Proofreaders site. The project has dramatically accelerated the output of Project Gutenberg, becoming the main source of its e-books in less than two years. Clearly, the rewards (in any traditional sense) for such activity are not self-evident.

The Value-Driven Enterprise

Most discussion about peer production has focused on the novel *means*—production occurring on a large scale outside the market/corporate system.

I believe that there is something else going on. This newly available means of networked peer production is catalyzing activity that is not just a new way to make the same old stuff. To understand it—to understand how the *ends* of the process of production will be critically changed

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by these new means—we need to look at the most neglected part of human economic activity: *purpose*.

In 1995 a former IBM programmer named Craig Newmark started keeping track of interesting events in the San Francisco area and telling people he knew about them. Word spread, and Craig started an email list to keep everyone notified. He called it “craigslist”.

There are now craigslists for more than 45 major cities in the US, providing “a trustworthy, efficient means for folks to get the word out regarding everyday stuff, and connect with others in the local community to find jobs, housing, companionship and community.” A Forrester report in 2000¹³ confirmed that craigslist was the most effective job site in San Francisco. Craigslist, running entirely on open source software, serves as many pages every day as Amazon.com—with a staff of just 14 people.

There have been estimates that if craigslist was ever offered for sale, it could be worth as much as \$100 million. However, craigslist won't be sold. In 1997, Craig Newmark decided not to make craigslist commercial. Craigslist does not even accept banner ads, despite lucrative offers. Nor

does craigslist charge the public for using its myriad services, except for a small fee required in three major cities for job postings—just enough to keep craigslist sustainable, with enough left over to make a difference with the causes important to Craig—including helping other non-market efforts get off the ground.

When you listen to the founders of enterprises like craigslist, you sense a very different motivation than the profit-driven rationale that powers traditional market/firm activity.

Craigslist CEO Jim Buckmaster told *BusinessWeek*¹⁴,

One thing that people often don't get about us: We're a public service first. Most businesses are conceived as a way of making money. Our primary mindset is philanthropic — to offer what we see as a public service. On our site you don't see banner ads, text ads, cookies, co-marketing agreements, selling user information to third parties—all of those nuisances users encounter on the majority of sites.

Similarly, Jimbo Wales, the founder of Wikipedia, has paid for all Wikipedia operations since its inception, with no financial return whatsoever. In a recent interview on Slashdot¹⁵, he stated:

It is my intention to get a copy of Wikipedia to every single person on the planet in their own language.... [This kind] of big picture ideal makes people very passionate about what we're doing. And it makes it possible for people to set aside a lot of personal differences and disputes...and just compromise to keep getting the work done. Imagine a world in which every single person on the planet is given free access to the sum of all human knowledge. That's what we're doing.

Historically, we have sacrificed certain individual freedoms, tolerated certain social inequities, and relinquished a degree of democratic oversight in order to enjoy the benefits of capitalist production.

CivicSpace Labs, in turn, describes its mission as, “Building a new kind of civic infrastructure, tools and technologies to connect citizens and help them organize themselves,” while Project Gutenberg founder and CEO Michael Hart says, “Project Gutenberg is powered by ideas, ideals, and by idealism. Project Gutenberg is NOT powered by financial or political power.”

Even Linus Torvalds¹⁶, who, like many “geeks” in the open source community, tends to emphasize the intrinsic pleasures of solving problems and writing code, describes his “basic rule of life” thus:

If you ever wonder, “What should I do?” and you ask yourself [the] question — “What would I want somebody else to do?” — suddenly you know the right answer.

None of these value-driven projects fit into the traditional capitalist model of profit-driven enterprises that are organized in hierarchical corporations to compete in the marketplace. No corporate leader of today could articulate management goals in such a manner, so devoid of consideration for “maximizing shareholder profit,” and keep their job.

What else can we learn from the unique characteristics of these new enabling technologies discussed above? And where can the example of individuals like Craig Newmark and Jimbo Wales lead society in the future?

The Implications for Democracy

Historically, the benefits conveyed by capitalism to society have come at the cost of significant tradeoffs. The pursuit of profit, organized in corporations competing in markets, is at best agnostic to (and often in direct conflict with) the public interest. That is why society has developed a system of checks-and-balances that, in theory, elevates the rule of law above individual and institutional power.

At the same time, we sacrifice certain individual freedoms, tolerate certain social inequities, and relinquish a degree of democratic oversight in order to enjoy the benefits of capitalist production. We don't produce wheat democratically, because we are more interested in everyone eating bread.

The layers of authority in hierarchical organizations reduce individual autonomy, while markets introduce social inequities (in fact, they depend on them—if wealth and the means of production were distributed equally, there would be no market incentive to excel). Neither corporations nor markets are run by democratic means.

We tolerate and even embrace these tradeoffs, because all historical alternatives have dramatically failed. Nevertheless, all but the most zealous of ideologues recognize the imperfections inherent in capitalist economies. Over time, free societies have employed varying degrees of government intervention in order to regulate markets and firms in order to limit the loss of autonomy and reduce social inequities. Most discussion of capitalism centers on the appropriate degree of such intervention.

The inherent qualities of networked peer production systems provide a powerful platform upon which to build transformative, value-driven enterprise.

These controls have been necessary because markets and businesses are fueled by the pursuit of profit, are agnostic towards the social interest, and required to compromise the principles of democracy, autonomy, and

equality. Peer production, in contrast, can serve the public interest and enable the creation of significant value with much less surrender of democracy and loss of individual freedom. As it has evolved, peer production is powered by a commitment to the common interest. It is agnostic towards profit and is both supportive of, and highly dependent upon, democracy, individual freedom, and social justice.

Peer production offers more, however, than mere liberation from the moral conflicts of a profit-driven world. Sadly, the mere will to “Do Good” does not seem sufficient in this world to motivate “right” conduct. If it were, charity alone would solve all problems of want and social inequity. In reality, the magnitude of our problems, the inertia of our institutions, and the relative poverty of the nonprofit realm (total charitable donations in the US equal but 2% of our GDP¹⁷) are inadequate to the task. Many dedicated nonprofit leaders in consequence spend a majority of

their time and energy securing donations to keep their organizations afloat, rather than devoting all of it to the causes to which they are committed.

The inherent qualities of networked peer production systems—the multiplier effect of online collaboration, the democratized production process, and the growing accessibility and low barriers to entry—provide a powerful platform upon which to build transformative, value-driven enterprise. I believe that this insight is the key to understanding the emergence, and significance, of value-driven enterprise on the Internet. All things being equal, most people would prefer to do work that makes a difference. All things are rarely equal, however, in the corporate world.

Trim Tabs to the Rescue

Futurist R. Buckminster Fuller often talked about the concept of a “trim tab.” Large ocean liners, tankers, aircraft carriers, and other massive vessels have equally massive rudders. However, even the sturdiest rudder axle would snap under the pressures of battling the inertia and water pressure resisting its attempt to change the direction of one of these behemoths. That is why, on the trailing edge of these giant rudders, there is a thin strip of steel called a trim tab. A relatively small motor turns the trim tab, which can withstand the relatively small water pressure against it. That pressure is translated to the massive rudder, which responds by turning in the opposite direction, and redirecting the entire ship.

With what we know today about the structural dynamics of tipping points, it is easy to see how the intentional application of trim tab sensibility can hope to affect change in even the most intractable problems.

Peer-production, enabled by networks like the Internet, makes possible purely-value-driven, non-market enterprise on a scale that was previously impossible. It makes each of us a potential trim tab.

Enterprises dedicated to generating profit tend, over time, to deemphasize the intangible, hard to measure quality of “Doing Good” in relation to the precisely quantifiable monetary metric of “maximizing shareholder profit.” On the other hand, charitable enterprises committed to making a difference generally are reconciled to living off the scraps capitalist enterprises throw their way, constantly at the mercy of the next fundraiser to continue their vital work.

Networked peer production offers a way to make a real difference without massive financial resources, political clout, or business connections. It makes things equal, and the challenge is to use it to make a difference.

Peer production has already been incorporated into profit-driven enterprises like Amazon.com (member book reviews), eBay (peer rating of sellers), and Epinions.com (product ratings and reviews). Clearly, commons-based peer production has a complementary role to traditional profit-driven activity.

It is also apparent that peer-production, enabled by networks like the Internet, makes possible purely-value-driven, non-market enterprise on a scale that was previously impossible. It makes each of us a potential trim tab.

If not for the power of networked peer-production, Michael Hart, who founded Project Gutenberg in 1971 while still a student at the University of Illinois, might still be laboring in obscurity, keying in whole books one at a time much as the monks of old did when transcribing manuscripts before the era of the printing press. He and his handful of helpers likely would not have made significant progress towards the goal of making a rich library of public domain books electronically available to all in his lifetime.

In fact, it took twenty years for the first 1,000 books to be entered. In the following two years, powered by networked peer production, the number of completed Project Gutenberg books doubled to 2,000. In 2001, two years after that, the number doubled to 4,000. The Distributed

Each value-driven venture may only be a tiny lever in the scheme of things, but aligned end to end, using open, Internet-based peer production as the fulcrum, we can form a lever big enough to move the world.

Proofreaders Project further utilized peer production techniques to accelerate the process beginning that year. By October 2003, the number of digitized books had topped 10,000. Project Gutenberg is now international—PG Europe was launched earlier this year. Michael Hart looks forward to the digitization of the millionth book in 2015. His projection might just be conservative.

Tiny Levers, Loosely Joined

My own value-driven effort is Public Interest Entertainment Corporation (PIECORP), a nonprofit attempt to move non-market, value-driven enterprise to the next level. Rather than focusing on production, or individual project sustainability, we seek to act as a trim tab to address the viability of the value-driven enterprise in general. We address these issues through design.

- First, our own open source product, *Mars First!*, is designed as an environment for experiential learning of civil society, non-violent conflict resolution, critical thinking, and science. Thus, we directly address a social need.
- Second, all the tools, technology, platforms, infrastructure, research, designs, and content we produce will be released to the public domain. In this way, we hope to make development of virtual worlds, currently a prohibitively expensive and highly proprietary process, available and affordable to all. We will also freely share the lessons we learn and the tools we build to help facilitate constructive, sustainable, democratic community management.
- Third, via player subscriptions, we will leverage our work to make an even greater difference in the world. First, by becoming rapidly self-supporting, we will sever our final dependence on the market/firm/charity system. Then, we will donate all net revenue to allied, worthwhile purposes: 90% of it to nonprofit organizations working in the fields of civil society, non-violent conflict resolution, democratic empowerment, science education, and critical thinking; and a critical 10% of net revenues to support the creation of other non-market open development enterprises that feature a similar, revenue-generating, further-reproducing model.

Our ultimate goal is to help jumpstart a new, alternative economy alongside the traditional, profit-driven, market/firm system that supports, sustains, and develops value-driven enterprise in non-market, non-corporate networks. Each value-driven venture may only be a tiny lever in the scheme of things, but aligned end to end, using open, Internet-based peer production as the fulcrum, we can form a lever big enough to move the world.

After all, if it doesn't make a difference, what's the point?

About the Author

David Galiel is Executive Director of PIECORP, a nonprofit creative studio using popular culture and digital entertainment technologies to promote civil society, non-violent conflict resolution, and critical thinking. Please share your thoughts about this essay with him, david at galiel dot com. If you are interested in Mars First! and would like to learn more, visit <http://www.piecorp.org/>.

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Cited projects:

Wikipedia: <http://wikipedia.org/>

Open Directory Project: <http://dmoz.org/>

OhmyNews: <http://english.ohmynews.com/>

Slashdot: <http://slashdot.org/>

Kuro5hin: <http://www.kuro5hin.org/>

Indymedia: <http://www.indymedia.org/>

CivicSpace Labs: <http://www.civicspacelabs.org/>

Project Gutenberg: <http://www.gutenberg.net/>

Craigslist: <http://www.craigslist.org/>

Distributed Proofreaders: <http://www.pgdp.net/>

PIECORP: <http://www.piecorp.org/>

Resources:

Brenda Laurel: http://www.tauzero.com/Brenda_Laurel/

Yochai Benkler: <http://benkler.org/>

Lawrence Lessig: <http://lessig.org/>

David A. Wheeler, *Why Open Source Software / Free Software (OSS/FS)? Look at the Numbers!*
http://www.dwheeler.com/oss_fs_why.html#market_share

Endnotes:

¹Mark J. Jones, *Brenda Laurel: the technodiva speaks*, CYBERSTAGE LIVE
<http://www.cyberstage.org/archive/cstage11/laurel11.html>.

² *Netcraft*, September 2004 Web Survey <http://www.netcraft.com/>.

³ <http://idc.com/>.

⁴ SSH Usage Profiling, <http://www.openssh.org/usage/>.

⁵ <http://www.forrester.com>.

⁶ *The Rise of Linux*. David Strom, VARBUSINESS Sept 10, 2003.
http://www.varbusiness.com/sections/technology/tech.jhtml?articleId=18825181&_requestid=52799.

⁷ The Ronald Coase Institute, <http://coase.org/>.

⁸ Yochai Benkler, *Freedom in the Commons: Towards A Political Economy of Information*, <http://www.law.duke.edu/shell/cite.pl?52+Duke+L.+J.+1245>.

⁹ Lawrence Lessig, *The Architecture of Innovation* <http://www.law.duke.edu/journals/dlj/articles/dlj51p1783.htm>.

¹⁰ The Buckminster Fuller Institute, <http://www.bfi.org/>.

¹¹ Wikipedia, <http://www.wikipedia.org/>.

¹² David Reed. *That Sneaky Exponential—Beyond Metcalfe's Law to the Power of Community Building*. <http://www.reed.com/Papers/GFN/reedslaw.html>.

¹³ Rachel E. Silverman, *Ranking Job Boards*, from THE WALL STREET JOURNAL, April 25, 2000 <http://www.craigslist.org/about/press/rankingjobboards.html>.

¹⁴ *A Talk with craigslist's Keeper* BUSINESSWEEK, September 8, 2004, Newsmaker Q&A, http://www.businessweek.com/bwdaily/dnflash/sep2004/nf2004098_1574_db051.htm.

¹⁵ Slashdot, July 28, 2004, *Wikipedia Founder Jimmy Wales Responds*, <http://interviews.slashdot.org/interviews/04/07/28/1351230.shtml>.

¹⁶ Jonathan Littman “*Software’s New Icon*” UPSIDE MAGAZINE., August 10, 1999

¹⁷ “Giving USA 2004” report Giving USA Foundation, American Association of Fundraising Counsel <http://www.aafrc.org/gusa/>.