

# The Internet of Things: Monopoly Capitalism vs. Collaborative Commons

***This post is excerpted from Jeremy Rifkin's new book, [The Zero Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism](#), published today by Palgrave Macmillan.***

If I had told you 25 years ago that, in a quarter century's time, one-third of the human race would be communicating with one another in huge global networks of hundreds of millions of people -- exchanging audio, video, and text -- and that the combined knowledge of the world would be accessible from a cellphone, that any single individual could post a new idea, introduce a product, or pass a thought to a billion people simultaneously, and that the cost of doing so would be nearly free, you would have shaken your head in disbelief. All are now reality.

But what if I were to say to you that 25 years from now, the bulk of the energy you use to heat your home and run your appliances, power your business, drive your vehicle, and operate every part of the global economy will likewise be nearly free? That's already the case for several million early adopters who have transformed their homes and businesses into micropower plants to harvest renewable energy on site. Even before any of the fixed costs for installation of solar and wind are paid back -- often in as little as two to eight years -- the marginal cost of the harvested energy is nearly free. Unlike fossil fuels and uranium for nuclear power, in which the commodity itself always costs something, the sun collected on your rooftop, the wind traveling up the side of your building, the heat coming up from the ground under your office, and the garbage anaerobically decomposing into biomass energy in your kitchen are all nearly free.

And what if prosumers everywhere were able to connect, produce and share their own energy, physical products, and services on a global Collaborative Commons, at low or near zero marginal cost? That too is beginning to evolve on a small scale as

thousands of start-up businesses and hobbyists establish 3D-printing operations, infofecture products at near zero marginal cost, power their Fab Labs with green electricity, market their goods for nearly free on hundreds of global websites, and deliver their products in electric and fuel-cell vehicles powered by their own green energy.

A powerful new technology revolution is emerging that is going to fundamentally alter our economic life. The Communication Internet is converging with an embryonic Energy Internet and Logistics Internet to create a new technology platform -- the Internet of Things (IoT) -- that connects everything and everyone. Billions of sensors are being attached to natural resources, production lines, the electricity grid, logistics networks, recycling flows, and implanted in homes, offices, stores, and vehicles, feeding Big Data into the IoT global neural network. Small and medium sized enterprises and *Prosumers* will be able to connect to the network and use Big Data, analytics, and algorithms to accelerate efficiency, dramatically increase productivity, and lower the marginal cost of producing and sharing a wide range of physical products and services to near zero, making them nearly free, just like we now do with information goods.

The plummeting of marginal costs is spawning a hybrid economy -- part capitalist market and part Collaborative Commons -- with far reaching implications for society. Millions of people are already transferring parts of their economic lives to the global Collaborative Commons. Prosumers are plugging into the fledgling IoT and making and sharing their own information, entertainment, green energy, and 3D-printed products at near zero marginal cost. They are also sharing cars, homes, clothes and other items via social media sites, rentals, redistribution clubs, and cooperatives at low or near zero marginal cost. Meanwhile, students are enrolling in free massive open online courses (MOOCs) that operate at near zero marginal cost. Social entrepreneurs are even bypassing the banking establishment and using crowdfunding to finance socially responsible startup businesses as well as creating alternative currencies in the incipient sharing economy. In this new world, social capital is as important as financial capital, access trumps ownership, sustainability

supersedes consumerism, cooperation ousts competition, and "exchange value" in the capitalist marketplace is increasingly replaced by "sharable value" on the Collaborative Commons.

The critical policy question now raging around the world is who will control the new IoT infrastructure and reap the vast benefits brought on by the unleashing of "extreme productivity"? The struggle to capture the IoT platform is being aggressively waged among governments, capitalist enterprises, and champions of an emerging Collaborative Commons, in courtrooms, legislatures and in the public arena. The outcome of this epic struggle will largely define the political landscape and the nature of economic activity as we move further into the twenty-first century.

## **Network Neutrality**

Until the present, the Internet, and now the more expansive Internet of Things, has been managed as a global Commons with three primary stakeholders playing a collaborative role in its governance -- the government, private sector, and civil society. Now, however, the private sector is beginning to stray from the three-party stakeholder alliance, seeking increased income and profits by way of price discrimination -- a move that threatens to undermine one of the guiding principles of the Internet: network neutrality, a principle that assures a nondiscriminatory, open, universal Communications Commons in which every participant enjoys equal access and inclusion. The concept of network neutrality grew out of the end-to-end design structure of the Internet, which favors the users rather than the network providers. While users pay for Internet connection, and the price they pay can depend on the speed or quality provided by their Internet service provider, once they're connected, their transmitted packets are treated the same way as everyone else's by the network providers.

Network providers -- the major telecom and cable companies -- would now like to change the rules of the game and secure control of information exchanged over the Internet of Things for commercial gain. That control would allow them to charge

different prices for access to specific information or to prioritize transmissions, putting time-sensitive packets at the front of the line for a higher price, or charge application fees, or block specific applications from their networks in favor of others, again based on exacting discriminatory payments.

In January 2014, the U.S. Court of Appeals, the nation's second highest court, knocked down the Federal Communication Commission's (FCC) long-standing regulation requiring "network neutrality," arguing that the commission had overstepped its regulatory authority (the FCC is currently reviewing its policy of network neutrality with the goal of maintaining the principle of open access to the Internet of Things without running afoul of its mandate).

Proponents of network neutrality argue that the network should remain "stupid," thereby allowing millions of end users to collaborate and innovate by developing their own applications. It's this kind of "distributed intelligence" that makes the Internet such a unique communications medium. If network providers were to gain centralized control over access to content and how it is delivered, it would disempower end users and undermine the creativity that comes with distributed collaboration and laterally scaled intelligence.

The struggle over network neutrality is, at its core, a battle of paradigms. The Second Industrial Revolution telecom and cable companies would like to control the content and the traffic on the IoT, in order to boost their margins, and secure a monopoly by dint of their ownership of the "pipes." Prosumers are equally determined to keep the Internet of Things an open Commons and find new apps that will advance network collaboration and a push to near zero marginal costs and near free goods and services.

## **The Internet Monopolists**

And it's not just the telecom and cable companies that are muscling in from the outside, attempting to enclose the IoT. It's coming from the inside as well. Some of the best-known social media sites on the Web are revving up to find new ways to

enclose, commercialize, and monopolize the new communications medium. And their bite is potentially far bigger than the companies managing the pipes.

Unfortunately, some of the biggest Internet companies like Google, Facebook, and Twitter, are cashing in on the very rules of engagement that made them so successful and selling the masses of transmitted Big Data that comes their way to commercial bidders and businesses that use it for targeted advertising and marketing campaigns, research efforts, the development of new goods and services, and a host of other commercial propositions. They are, in effect, exploiting the Commons for commercial ends.

Should we worry about social media sites sharing everything they know about us with third-party commercial interests? Of course, no one wants to be pestered by targeted advertising. More sinister, however, is the prospect of health insurance companies learning whether you had been Googling research on specific illnesses or prospective employers prying into your personal social history by analyzing your data trail on the Web to spot potential quirks, idiosyncrasies, or even possible antisocial behavior.

Worse, is this newest form of commercial exploitation creating corporate monopolies in virtual space that are every bit as centralizing and proprietary as the Second Industrial Revolution companies they are dislodging from power? By 2013, Google was fielding almost 6 billion searches a day, and enjoyed a market share of 67 percent among search engines in the United States, 93 percent in Germany, 89 percent in the United Kingdom, and 95 percent in France.

Facebook has gobbled up 72.4 percent of the global market share of social networks, and as of January 2014, boasted over 1.3 billion active users--that's nearly one out of every six human beings living on Earth. Its visitors spend an average of 405 minutes a month on the site: that's the number of minutes of the next six most popular sites combined -- Tumblr (89), Pinterest (89), Twitter (21), LinkedIn (21), Myspace (8), and Google+ (3). Facebook's revenue in 2013 was \$7.8 billion.

Twitter now has over 600 million registered users, of which 200 million are active tweeters. The rest prefer to be listeners. The company is expected to make more than \$1 billion in revenue in 2014.

The overtly commercial sites, like Amazon and eBay, that include Collaborative Commons features, are also quickly becoming online monopolies. According to a study conducted by Forrester Research, one out of every three online users starts their product searches on Amazon.com, "compared to 13 percent who started their search from a traditional search site." Amazon has "over 152 million active Amazon customer accounts," "over 2 million active seller accounts," a worldwide logistical network that serves 178 countries, and enjoyed revenues in excess of \$74 billion in 2013. By 2008, eBay had grabbed 99 percent of the market for online auctions in the United States, with a similar track record in most other industrialized countries. eBay's revenue in 2012 was \$14.1 billion.

Tim Wu, a professor of law at Columbia University and a senior adviser to the U.S. Federal Trade Commission, raises an interesting question about the new corporate giants that are colonizing large swaths of virtual space. He asks, "how hard would it be to go a week without Google? Or, to up the ante, without Facebook, Amazon, Skype, Twitter, Apple, eBay, and Google?" Wu is putting his finger on a disquieting new reality -- that the new communication medium a younger generation gravitated to because of its promise of openness, transparency, and deep social collaboration masks another persona more concerned with ringing up profit by advancing a networked Commons. Wu writes:

Most of the major sectors [on the Internet] today are controlled by one dominant company or an oligopoly. Google "owns" search; Facebook, social networking; eBay rules auctions; Apple dominates online content delivery; Amazon, retail; and so on.

Wu asks why the Internet looks "increasingly like a Monopoly board."

A growing number of communications-industry analysts and antitrust attorneys are

asking whether these new heavyweights in virtual space are really "natural monopolies" like AT&T and the power and utility companies of the twentieth century and therefore either legitimate candidates for antitrust action or for regulation as public utilities. They argue that if one or both of these courses is not rigorously pursued, the great promise of the IoT as a shared global Commons is going to be irretrievably lost and, with it, the hopes and aspirations of a generation that has put such store on a peer-to-peer collaboratist ethos.

## **Empowering The Energy Internet**

The telecommunication and cable companies, and the profit-making online enterprises are not the only commercial players attempting to thwart an open, transparent, and democratically managed Internet of Things infrastructure.

Already, the creation of an Internet of Things across locales, regions, countries, and continents is coming up against powerful, entrenched energy and electricity transmission companies with commercial interests every bit as formidable as the telecommunication companies, cable companies, and profit-making online enterprises.

Global energy companies and power and utility companies are, in some cases, blocking the creation of an Energy Internet altogether. In other instances, they are attempting to force a centralized architecture on the smart grid, to enable the commercial enclosure of the new energies.

The European Union, the world's largest economy, has taken steps to keep the Energy Internet an open architecture by requiring that conventional power and utility companies unbundle their power generation from their transmission of electricity. The unbundling regulations came about because of growing complaints by millions of small, new renewable energy producers that the big power and utility companies were making it difficult for them to connect their local micropower plants to the main transmission grid. The companies were also accused of discriminatory practices that favored speedy connectivity for green electricity

generated by affiliated business partners and of imposing bureaucratic delays and even refusing to accept green electricity from others.

Electric utilities are also fighting on a second front, with behind-the-scenes maneuvers to design a smart grid that is centralized, proprietary, and closed, and in which all transmission data flows only in one direction, from prosumers to headquarters. The objective is to withhold vital information from the millions of new prosumers on moment-to-moment changes in the price of electricity as well as to prevent them from controlling when to upload their electricity onto the grid to take advantage of peak electricity prices at various times of the day.

These efforts by the electricity transmission companies appear to be losing steam as countries all over the world introduce green feed-in tariffs to encourage millions of end users to produce their own green electricity and share it across an Energy Internet.

The generation that grew up on the Communication Internet and that takes for granted its right to create value in distributed, collaborative, peer-to-peer virtual commons has little hesitation about generating their own green electricity and sharing it on an Energy Internet. They find themselves living through a deepening global economic crisis and an even more terrifying shift in Earth's climate, caused by an economic system reliant on fossil fuel energy and managed by centralized, top-down command and control systems. If they fault the giant telecommunications, media, and entertainment companies for blocking their right to collaborate freely with their peers in an open Information Commons, they are no less critical of the world's giant energy, power, and utility companies, which they blame, in part, for the high price of energy, a declining economy, and looming environmental crisis.

For a growing number of young people, the conventional energy and utility companies represent the very archetype of centralized power and all the ills that it has forced on the world. The prospect that those ills can be cured by joining together in open, collaborative, and democratically managed green electricity

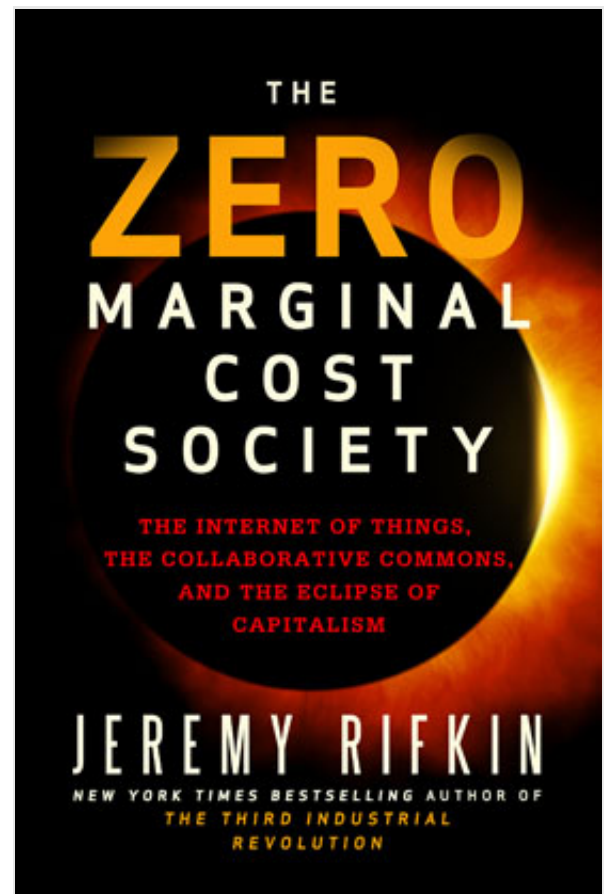


cooperatives to produce and share clean energy is empowering. It is inspiring a generation to rally under the banner of sustainability. The call for free access to communication is now being joined by the demands for near zero marginal cost green energy.

It's highly unlikely that the global companies attempting to capture the Internet of Things will escape some kind of regulatory restriction by way of either antitrust action or treating them as global social utilities with appropriate regulatory oversight. The nature and extent of the oversight is still very much an open question. What's not in question is the need to address the worrisome commercial enclosure of a technology platform whose very existence is predicated on the premise of providing a universal Commons in which all of humanity can collaborate and create value across every sector of social life at near zero marginal cost.

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The struggle between investor capitalists and prosumer collaboratists over control of the Internet of Things, while still embryonic, is shaping up to be the critical economic battle of the first half of the twenty-first century. Global telecom, cable, Internet, energy and electricity companies are determined to enclose the IoT and monopolize the flow of communication, power generation, and logistics, keeping the price of producing and distributing goods and services far above their marginal cost, to optimize their profits. The new prosumers, on the other hand, are increasingly banding together in lateral networks, producing and sharing information goods, renewable energy, 3D printed products, and an array of



services on a global Collaborative Commons at near zero marginal costs, disrupting the workings of capitalist markets. The unfolding economic clash between the capitalists and collaboratists is a manifestation of a cultural conflict that will likely redefine the nature of the human journey in the years ahead. If there is an underlying theme to the emerging cultural conflict, it is the "monopolization vs. democratization of everything."

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