

Running head: NET MUTUALISM

Net Mutualism: Natural Economics of Information Networks

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Abstract

This paper argues that the information network economy is giving rise to forms of behavior that are pedagogically ecological.

Net Mutualism

Daly (2004) argues that “the economic system is embedded as a component of human culture, it is in a constant state of evolution” (p.7). While this may seem obvious, it needs to be reiterated as we debate the necessary steps to transform our “operating system” from being programmed by neoclassic assumptions to one built upon ecological architecture. If there is one point of agreement between neo-classical and ecological economics, it’s that the market responds to the behavior of people, and people are far from static entities. As such it is of great interest that emergent behavior in online networks is spontaneously forming patterns of mutualism that appear to be, in the view of economist Yochai Benkler (2006), reversing long, dominant trends in capitalism. “It is the first modern communications medium that expands its reach by decentralizing the capital structure of production and distribution of information, culture, and knowledge. Much of the physical capital that embeds most of the intelligence in the network is widely diffused and owned by end users” (p. 30). As end users, we are self-organizing towards cooperative economics, which makes evolutionary sense, for as Golley (1998) notes, “There seems to be no logical reason why competition should be chosen over mutualism as a way of organizing relationships” (p.182). Fortunately, network economics offers a view into group behavior that might suggest the future evolution of human cooperative economics.

Electronic Networks as Pedagogy

The “real message of globalization,” Nicanor Perlas tells us, is to become “more aware of how deeply we’re interconnected as human beings across all of society” (quoted in Senge *et al*, p. 239). This is made visible because, “The global economy is organized around technology” (Woodbridge, 2004, p. 118), and because markets requires electronic communication to facilitate

their activities. In the crudest sense, prices are markers that set various systems into motion. But when this process is globalized and amplified by computer networks, complexity increases. Capra (2004) notes how, “The information circuits of the global economy operate at such speed and use such a multitude of sources that they constantly react to a flurry of information, and thus the system as a whole is spinning out of control” (p. 140). As such, global interconnectedness, Woodbridge believes, “makes market prices and mechanisms unreliable tools when it comes to deciding how to provision societies in conditions of ecological scarcity. Thus, there is an urgent need to look more to technology and management solutions to address the huge challenge of provisioning growth and poverty reduction” (p. 167).

When it comes to provisioning—the primary task of social organization—Woodridge thinks computer networks are an essential component of global coordination and resource management. He remains convinced that globalization “works,” but qualifies that with a general critique of business as usual:

In the end, sound environmental management is just that! Pricing mechanism can be used to assist, but the world needs to look to management, technology, and organizational solutions if the challenges of global provisioning are to be met. Simply stated, it is necessary to change the interface between human societies and natural systems, and this cannot be done without changing technologies and management practices. (p. 204)

Such changes are happening at a grassroots level, but they are yet to “trickle up” to the global managers of corporations. To some critics this is an impossible task because they believe technology innately conditions and alienates our experience of the world. So though we need the computers to facilitate our system, there are also phenomenological consequences. “Interface”

and “management” are design issues, but network technology also has the potential of distancing us from “nature.”

Not surprisingly, based on computer models described in *The Limits of Growth* (2004), Meadows *et al* demonstrate that the problem of overshoot are potentially exacerbated by global technology. Systems require feedback for checks and balances, but feedback in the global system can be impacted by three factors: goals, costs, and delays. Goals are a matter of ethics. As Daly points out, “economics is about what we desire and what we’re willing to give up to get it” (p.3). He lists three critical questions:

- 1) What ends do we desire?
- 2) What limited, or scarce, resources do we need to attain these ends?
- 3) What ends get priority, and to what extent should we allocate resources to them? (p. 3)

These are questions of provisioning, but also are moral queries. A computer network doesn’t make ethical decisions, and when something is disembedded or abstracted in the symbolic language of binary codes and money, decisions about humans and communities are easier to make without consciousness. A forest in Borneo can be clear-cut in New York; ethical decisions can be made at a distance in the same way one is more likely to drop bombs from 3,000 feet than stand next to a child and pull a gun’s trigger. No doubt, technology dissociates us from the local impact of a keystroke.

Though Meadows *et al* argue that costs are the second reason why technology and markets won’t automatically lead to sustainability, but information technology (and hopefully green technology as well) are decreasing in price, and novel uses are often coming from unexpected sectors of society (such as cell phones in Africa becoming mini-network hubs for information dissemination, coordination and organization). So though transitioning (retooling)

is expensive for industrial and abatement technology, networking is increasingly cheaper. The third factor is information distortions and delays. Feedback is subject to “overshoot, oscillation, and instability,” such as oil prices and finance bubbles. “In systems terms, changing structure means changing the *feedback structure, the information links* in a system: the content and timeliness of the data that actors in the system have to work with, and the ideas, goals, incentives, costs, and feedbacks that motivate or constrain behavior” (Meadows et al, p. 237). A fourth factor can be misperception or the lack of ecologically oriented information. Thankfully this kind of feedback is getting better and more transparent as evidenced by the ever-expanding social Web that enables alternative information networks. (More about this will be explained in the next section.)

Hornberg (2001) points out that machines are semiotic instruments that manifest a matrix of relations: “It is noteworthy that ‘technology’ does not refer to the machines themselves but to the ‘systematic knowledge’ and ascertained ‘truths’ that go into their constructions” (p. 121). Just as pollution or strip mines are types of communication, so too is a tractor, which still embodies unequal relations and distribution of power. Thus, economics are not just “house management” (as Jacobs’ deconstruction of the term reveals (p. 10)), but is in fact a phenomenology. Castells observes that in the case of global computer networks, the medium is the message. In the same way that “ecology is the study of connections” (Golley, p. 231), networks are pedagogical manifestations of linkage:

The fragmentation of culture and the recurrent circularity of the hypertext lead to the individualization of cultural meaning in communication networks. The networking of production, the differentiation of consumption, the decentering of power and the individualization of experience are reflected, amplified and codified by the fragmentation

of meaning in the broken mirror of the electronic hypertext, where the only shared meaning is the meaning of sharing the network. (Quoted in Rantanen, 2005, p.144)

McLuhan argued that with every technological adaptation there are both gains and losses. For example, the phone makes conversing across space easier, but we also lose the dimension of body language in communication. Consequently, global electronic networks increase our connectivity while simultaneously disembedding us.

Most of us have little idea of our capacity to create the qualities we truly value in living, because our culture has encouraged shifting the burden away from this sort of knowledge for a very long time. By giving us perceived power, modern technology reduces the felt need to cultivate our own sources of power. After a while, power through our technology is all that we know. (Senge et al, pp.207-8)

This is along the lines of Mander's (1996) "absence of the sacred" argument when he observes, "the advance of computers is contributing to a loss of ecological sensitivity and understanding, since the very process of using computers, particularly educating through computers effectively excludes an entire set of ideas and experiences that heretofore had been building blocks for developing connection with the earth" (Mander, 356-7).

Here Comes Everybody

Though there remains a chicken and egg argument about technological adaptation—does the technology create the culture, or the culture create the technology—the fact is that like singer and song, technology and economics are inseparable. But one thing is for sure, technology makes observable phenomena otherwise invisible, such as when sound becomes visible on the wing of a plane when it breaks the sound barrier. If the medium is the message, then technology manifests an ideological matrix. Yet end users are ingenious, and may have different uses for the tools that

were not originally intended. So though global computer networks possess the negative characteristics noted above, there are positive signs that through the process of self-organization, nature's architecture of creativity is in fact asserting itself within networks, because as end users who constantly shape and evolve networks, we remain ecological beings.

The chaos we are witnessing in global financial markets may in fact be an example of dissipative structures. From Capra's model of the increasingly abstracted networked economy, a system can become unstable, then encounter a bifurcation point "where new structures and new forms of order may emerge" (p.14). This reach towards novelty has an architecture, one of the most important being self-generating networks:

the hallmark of self-organization, occurs only when the system is far from equilibrium....

[S]elf-organization is the spontaneous emergence of new structures and new forms of behavior in open systems far from equilibrium, characterized by internal feedback loops and described mathematically by nonlinear equations. (Capra, 1996, p. 85)

In the context of economics, Jacobs describes this phenomenon in terms of evolutionary theory. In her summary of governing processes that lead to successful economic and ecological life, she argues that nature and economics evolve via a process of "development and codevelopment through differentiations and their combinations; expansion through diversification; continuation through self-refueling; stabilization through self-correction— all brought into order through unpredictable self-correction" (p. 145). This "in the making" is always happening now in the same way that language is always being collectively invented. "Like language," Jacobs argues, "economic life permits us to develop cultures and multitudes of purposes... that's its function which is most meaningful for us" (147).

Nature's creative process is evident in the way that emergent practices on the Internet are altering traditional models of hierarchical media distribution. For example, many of the books used in my background research for this essay are paperless and free (see Lessig, 2004; Benkler, 2006; Mason, 2008; Boyle, 2008). They are offered via an alternative to standard copyright called Creative Commons, which in essence is a tool for authors and artists to offer their work to the public so that they can be shared, remixed and expanded upon without punishment to the users, as long as the work is not resold without authorization. Consequently, the books I downloaded are offered free on computer networks I use, and also as an object for sale on Amazon.com in the form of a physical book. Musicians are also experimenting with this new system of distribution, which is contrary to classical concepts of copyright and property ownership; some are even asking their fans to set their own price for new albums (Radiohead and Nine Inch Nails recently did this on their official Websites). Such distribution practices are characterized by sharing and an open information architecture, which are relevant to the study of ecological economics because they may represent an evolutionary step (bifurcation) in the nature of economies that Jacobs speaks of, and could signify emergent behavior resulting from the dissipative structure represented by our current financial collapse.

Shirky (2008) documents a number of practices now resulting from online social networks. He explores the "architecture of participation" that characterizes so many new social media practices:

Though the hive is not part of any individual bee, it is part of the colony, both shaped by and shaping the lives of its inhabitants. The hive is a social device, a piece of bee information technology that provides a platform, literally, for the communication and coordination that keeps the colony viable. Individual bees can't be understood separately

from the colony or from their shared, co-created environment. So it is with human networks; bees make hives, we make mobile phones. (p.17)

To summarize the myriad of cultural shifts documented in his book, Shirky says, “The current change, in one sentence, is this: most of the barriers to group action have collapsed, and without those barriers, we are free to explore new ways of gathering together and getting things done” (p. 22). Such activities include sharing, cooperation and collective action, the kinds of activities that are already decentralizing the media business, and provide solutions for historically troublesome social dilemmas such as the “tragedy of the commons.” As Benkler argues, “It is the feasibility of producing information, knowledge, and culture through social, rather than market and proprietary relations—through cooperative peer production and coordinate individual action—that creates the opportunities for greater autonomous action, a more critical culture, a more discursively engaged and better informed republic, and perhaps a more equitable global community” (p. 92).

Why is this relevant to ecological economics? Analyzing carrying capacity is important and necessary for management of ecosystems, but without tools for collective action, how will we achieve our goals? Just as neoclassic economics fails to calculate the “free” services of the ecosystem, it also neglects to factor the voluntary, gift-giving behaviors of the public, which are often marginalized as exotic anomalies of cultures outside of capitalism’s sphere. Benkler’s analysis of network economic behavior reveals something quite different than normal economic assumptions, yet they are intuitive if we recall how many times we offer services for free without motivation for monetary gain in our everyday behaviors. Helping friends move, cooking for others, giving directions, fixing a flat tire, and holding open a door are banal activities but not insignificant markers of human behavior in which we see ourselves as part of an overall unity,

but they are not calculated in economic equations. Part of the problem, I believe, is simply ideological. So many institutions of thought have invested in the notion of competition as being the sole motivating factor of the market.

The idea of competition as the dominant strain of evolutionary thinking is a consequence of positivism, male domination of science, and Darwin's historical moment in which colonialism, imperialism and racism shaped institutional thought, thereby centering mechanistic thinking at the core of economic theory. Darwinian evolution, Golley notes, "may be useful in explaining development in individuals, it lacks the power to explain group behaviors" (p.186). Indeed, Jacobs offers an alternative take on evolution that can inform our discussion of emergent mutualism on the Net. Jacobs argues that successful predators "graduate to become symbionts" (p. 121). Fitness of habitat is the alternate meaning of being "fit"; we settle into niches that make the best sense for survival, a kind of patterning also made evident by self-generating communities on the Web.

Grant (2007) suggests that the network business model is less image based, and more based on service. Consider Ebay, Amazon.com, Craigslist and Google, and how little branding they do, both on the front end when you enter their sites, but also in the general marketplace. Yet these are highly profitable businesses that depend not on manufacturing product, but on coordinating the interests of their users. Every time you search Google, for instance, you are helping build an algorithm that will impact future online searches and connections, because searches are ranked by how many links and searches go to particular key words. Or a book that you purchase or review on Amazon.com will generate a sale to stranger. On Ebay you are rated by users based on past behavior, which impact sales with future customers. In such a transparent environment in which the collective intelligence of network users is harvested and shared, we

come to what Grant believes as a significant new stage in the marketplace in which imaging your company green means the opposite: if you have to show it, you're are not doing it. This goes to the heart of Castells' analysis of the network society: the network is the medium, meaning that networks are pedagogical instruments that are less about content, and more about form. As a green marketer, Grant's central thesis is that the only way to market green is to become an ethically green company; anything less would instantaneously be deemed hypocritical in the open market of empowered consumers. It's not worth the "flak" to present a false face.

Golley argues that, "Individuals are more likely to cooperate when they are familiar with other members of the group" (p. 187). In the Tit for Tat experiment regarding the prisoner's dilemma, he notes that people would retaliate if betrayed, but would repeat cooperative behavior as reciprocation for mutual aid. Curiously, an example of this took place as I was writing this paper. Earlier in the day an anonymous deliveryman delivered a COD package for which we accidentally overpaid by 20 Euros. It happened to be a rainy day, so when he arrived we offered him coffee and a towel to dry off. Later in the day he returned with our change, even though we were unaware of the overpayment, and it was probably inconvenient for him to return with the money. Why didn't he just keep the money? Was it our initial act of generosity that compelled him? Or was it personal ethics that guided his behavior? Either way, this is a fraction of the myriad of silent, daily transactions that take place that suggest an alternate set of motives for our behavior in the commons. If this had taken place on a Website like Ebay, this behavior would actually be calculated into the grading of the overall transaction. Thus, there is much to be said for the rankings and transparency of emerging network practices. People leave digital trails on the Web; tweak one strand of the World Wide Web, and it reverberates through another.

I'm reminded of Joseph Campbell's discussion of the soldier in battle who risks his life to rescue a wounded comrade. Moments like that are experiences of unity with the universe, when the notion of self dissolves. Not surprisingly, one of the first acts of Buddhist practice is charity. Why? Because when you give something it is the moment when you acknowledge your connection with another being. As Jacobs remarks, "Possibly the very oldest economic generality is based on the practice of sharing" (p. 27). When Senge *et al*, debate the essay "Global Requiem," their take-home message is that our culture has to change from one that takes to one that gives. If Rifkin (2004) is correct, the rise of the non-profit, volunteer Third Sector may be one of the most promising trends in the wake of the disintegration of the industrial economy:

Now... that the commercial and public sectors are no longer capable of securing some of the fundamental needs of the people, the public has little choice but to begin looking out for itself, once again, by reestablishing viable communities as a buffer against both the impersonal forces of the global market and increasingly weak and incompetent central governing authorities.... The talents and energy of both the employed and unemployed—those with leisure hours and those with idle time—could be effectively directed toward rebuilding thousands of local communities and creating a third force that flourishes independent of the marketplace and the public sector. (pp. 238-9)

What better way to coordinate these activities than by using Meetup.com to schedule a face-to-face meeting with strangers; to organize a "smart mob" with text messaging blasts; to build professional networks on LinkedIn.com; or start a discussion group on Facebook. It's no exaggeration when Shirky titles his book, *Here Comes Everybody: The Power of Organizing Without Organizing*. It's economic communication in the making, now.

I am not arguing that technology itself is making altruism possible, but what global information networks are doing is facilitating and patterning behavior that comes naturally to us. Whereas in the past the cost was prohibitive for users to form their own communities of practice, now they are expanding exponentially, partly due to the increasing connectivity facilitated by the Net. It would be wrong for me to posit global information networks as a utopian solution, especially considering the continued imbalances and access issues of the digital divide, and the problems of distancing and disembedding discussed previously. But what I am suggesting is that we can examine the current situation as evidence for alternative, or more ecological, really, behaviors that are in the process of composting neoclassical assumptions. When it comes to ecological economics, the rise of mutualism on the Net is no trivial matter.

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