THE NATURE OF NETWORKS

Why Technology Tends to Eliminate Alternatives to Itself

Essay by Nancy B. Zurbuchen
Year: 1999

"Technology is the campfire around which we gather."
Musician/artist Laurie Anderson

Technology and its effect on society have been defined in many ways, including everything from Laurie Anderson's "campfires" to Neil Postman's "totalitarian technocracy." Technology for the masses is taken for granted, as it has become so pervasive in our lives that we don't even notice it anymore. The telephone, pagers, television, and radios have invaded our personal space. More recently, computers and the Internet have done the same. If it continues, as it most certainly will, some have argued that technology will eventually eliminate alternatives to itself. This paper will argue why this belief is not a fanatic's fantasy, but rather it is rooted in the unstoppable behavior of technology.

The Network Argument

"Technology has become our culture, our culture technology."
Kevin Kelly, author

Writ small, the reason technology tends to eliminate alternatives to itself is because of the nature of *networks*. Writ large, it goes like this:

> "Networks have existed in every economy. What's different now is that networks, enhanced and multiplied by technology, penetrate our lives so deeply that 'network' has become the central metaphor around which our thinking and our economy are organized." Why did this happen? Because networks facilitate communication, and communication is the "foundation of our society, of our culture, of our humanity, of our own individual identity, and of all economic systems. This is why networks are such a big deal. Not because it happens to be the fashionable leading business sector of the day, but because its cultural, technological, and conceptual impacts reverberate at the root of our lives." (Kelly, pp.2,5)

The Nature of Networks

"The future of technology is networks. Networks large, wide, deep and fast."
Kevin Kelly, author

Connectivity

Networks come about when two things happen: 1) nodes are connected with other nodes, and 2) bits of information pass between them. Interestingly, the information passing between them does not have to be astonishing to achieve astonishing results. In fact, the exchange of information doesn't have to even originate or interface with a human for the results to be useful, or for it to be considered "networked." An example is tiny, cheap processor chips (known as "jelly beans") embedded into each object in a warehouse. Instead of using barcodes and humans with scanners to keep track of inventory, these tiny chips transmit their SKU and location to receptors in the warehouse. What's the advantage of this information flow? Inventory is real-time, with automatic decrementation as units leave the building; the warehouse can be arranged according to popularity of items rather than by SKU, cutting down on order filling time; orders to the manufacturers are automatically grouped, timed, and predicted. Each jellybean, along with each receptor, is considered a node in the network, each transmission a wireless connection.

In blanketing the world with a vast network of nodes and connectors, we are sealing the migration from mass to bits that began with computer chips, (Kelly, p.74) an essential step in the process of network creation.

Pervasiveness

Networks by nature grow to connect everything to everything because the more nodes and connections, the more valuable it becomes. "The value of a network explodes as its membership increases, and then the value explosion sucks in yet more members, compounding the result." (Kelly p.25) The Internet itself is a prime example of this principle in action. Networks are constantly changing, reacting, and becoming ubiquitous. Even as we participate in a small local network, it is linked to another, and another, and so on.

Intangibility

Networks favor intangible things – ideas, information, and relationships. Because of this, they tend to influence our perception of self and others in that the meanings of words are altered to fit the new medium. For example, the definitions of "public" and "private" blur when the Internet allows mass-delivered messages to be customized for an individual (Jones, p.7); "identity" and "relationship" take on new meanings in the computer-mediated messaging taking place in Internet chat rooms (Jones, p.28); and the concepts of "time" and "place" are compressed into near non-entities. Sandy Stone (1991) has defined virtual communities as "social spaces in which people still meet face-to-face, but under new definitions of both 'meet' and 'face'. . ." Similarly, Steven Jones (1998) wonders "is our notion of 'genuine' changing in an age where more people every day live their lives in increasingly artificial environments?"

Dissemination

Networks are very efficient at disseminating information (call it bits, data, or knowledge) and, by extension, power and wealth. By definition a network is decentralized, with no hierarchical authority. As such, they tend to undermine authority structures, shifting individual allegiance from traditional social entities (companies, families, neighborhoods) to networks of peer groups and interest groups (Kelly, pp.65, 132).

The effects of networks on dissemination of wealth are "not about economies of scale, they are about value that is created above and beyond a single organization – by a larger network – and then returned to the parts, often unevenly" (Kelly, p.28). This network tendency undermines the concept of industrial monopolies. An example is the growth of Silicon Valley, whose success is external to any particular company's success, and has in effect "become one large, distributed company," according to AnnaLee Saxenian, author of *Regional Advantage*.

Economics

According to Kevin Kelly, author of *New Rules for the New Economy*, "The three great currents of the network economy [are]: vast globalization, steady dematerialization into knowledge, and deep, ubiquitous networking. These three tides are washing over all shores. Their encroachment is steady, and ***self-reinforcing***. Their combined effect can be rendered simply: The net wins."

The self-reinforcing (also called self-perfecting) aspect of networks assures that they will be, and are, indispensable in the marketplace. In fact, they ***are*** the marketplace. The lure of networks – the 'ultimate' in faster, easier, and cheaper – drives the economy. Networks allow companies to magnify small advantages and to lock the advantage in (Kelly, p.29).

Because of networks, the new economic laws of "plentitude" turn conventional economic wisdom upside down. Whereas conventional economics state that value comes from scarcity, networked economics recognize that greater value comes from plentitude. Consider the first fax machine. It cost a lot, but it had no value until the second one was produced and put into service. The third and subsequent ones had more value ***and created more value*** than the first two, while at the same time costing less in real dollars (Kelly, p.40). This is an example of the concept of networks being "self-reinforcing."

Opportunities

Networks create an environment for new opportunities from a collective, ever-changing "whole" that has vastly more potential than its individual parts. Networks enable people to make new connections, see new possibilities, and cultivate new relationships. It is out of relationships (between concepts, ideas, and human interaction) that new products, services, and intangibles are spawned. One example is the connection between the nearly free jellybean chips, mentioned earlier in this article, and toppling Telco charges (Kelly, p.31). The result was that it became feasible to exchange data almost anywhere, anytime. The Internet, "granddaddy" of networks, became accessible to the masses.

The Postmodern Influence

"In the great vacuum of meaning, in the silence of unspoken values, in the vacancy of something large to stand for, something bigger than oneself, technology – for better or worse – will shape our society."

Kevin Kelly, author

Scholars have drawn comparisons between postmodern ideology and technology. Steven Jones (1998) quotes Edward Soya (1989) in discussing the reproduction of social space in which identity can be created and negotiated, using the term "postmodern geographies" (Jones, p.9). Kevin Kelly (1998) states that "it is no coincidence that global networks appear at the same time as the postmodern literary movement." Steven Best and Douglas Kellner summed it up in their book, *The Postmodern Turn*: "The postmodern turn results in fragmentation, instability, indeterminacy, and uncertainty." This also sums up the net. (Kelly, p.159).

Networks foster the lack of shared values, advancing contingency and multiplicity. "Because of the nature of the network . . . the anchors of meaning and value are in short supply. We are simply unable to deal with questions that cannot be answered by means of technology." (Kelly, p.159)

Conclusion

The nature of networks – their connectivity, pervasiveness, intangibility, economics, power of dissemination, and their creation of opportunities – ensures technology will virtually eliminate alternatives to itself in a networked society.

References

Best, Steven and Douglas Kellner (1994). *The Postmodern Turn*. Xx:xx.

Cairncross, F. (1997). *The Death of Distance: How the Communications Revolution Will Change Our Lives*. Boston, MA: Harvard University Press

Jones, Steven G. (1998). *Cybersociety 2.0*. Thousand Oaks, CA: Sage Publications

Kelly, Kevin (1998). *New Rules for the New Economy*. New York, NY: Penguin Group.

Leebaert, Derek (1998). *The Future of the Electronic Marketplace*. Cambridge, MA: The MIT Press.

Saxion, AnnaLee (1998). *Regional Advantage*. Xx:xx.