

The Wealth of Networks: How Social Production Transforms Markets and Freedom by Yochai Benkler, Yale University Press

© Copyright 2006, Yochai Benkler.

Part I The Networked Information Economy

Epigraph

"Human nature is not a machine to be built after a model, and set to do exactly the work prescribed for it, but a tree, which requires to grow and develop itself on all sides, according to the tendency of the inward forces which make it a living thing."

"Such are the differences among human beings in their sources of pleasure, their susceptibilities of pain, and the operation on them of different physical and moral agencies, that unless there is a corresponding diversity in their modes of life, they neither obtain their fair share of happiness, nor grow up to the mental, moral, and aesthetic stature of which their nature is capable."

John Stuart Mill, On Liberty (1859)

This printable version has been created under a **Creative Commons Attribution NonCommercial ShareAlike** license - see www.benkler.org - and has been reformatted and designated as recommended reading - with an accompanying Moodle course - for the **NGO Committee on Education of CONGO** - the **Conference Of Non-Governmental Organizations** in Consultative Relationship with the United Nations - in conjunction with the Committee's commitment to the **United Nations Decade of Education for Sustainable Development**, the **International Decade for a Culture of Peace and Non-violence for the Children of the World** and related international Decades, agreements, conventions and treaties.

Part I

The Networked Information Economy

For more than 150 years, new communications technologies have tended to concentrate and commercialize the production and exchange of information, while extending the geographic and social reach of information distribution networks. High-volume mechanical presses and the telegraph combined with new business practices to change newspapers from small-circulation local efforts into mass media. Newspapers became means of communications intended to reach ever-larger and more dispersed audiences, and their management required substantial capital investment. As the size of the audience and its geographic and social dispersion increased, public discourse developed an increasingly one-way model. Information and opinion that was widely known and formed the shared basis for political conversation and broad social relations flowed from ever more capital-intensive commercial and professional producers to passive, undifferentiated consumers. It was a model easily adopted and amplified by radio, television, and later cable and satellite communications. This trend did not cover all forms of communication and culture. Telephones and personal interactions, most importantly, and small-scale distributions, like mimeographed handbills, were obvious alternatives. Yet the growth of efficient transportation and effective large-scale managerial and administrative structures meant that the sources of effective political and economic power extended over larger geographic areas and required reaching a larger and more geographically dispersed population. The economics of long-distance mass distribution systems necessary to reach this constantly increasing and more dispersed relevant population were typified by high up-front costs and low marginal costs of distribution. These cost characteristics drove cultural production toward delivery to ever-wider audiences of increasingly high production-value goods, whose fixed costs could be spread over ever-larger audiences - like television series, recorded music, and movies. Because of these economic characteristics, the mass-media model of information and cultural production and transmission became the dominant form of public communication in the twentieth century.

The Internet presents the possibility of a radical reversal of this long trend. 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. Network routers and servers are not qualitatively different from the computers that end users own, unlike broadcast stations or cable systems, which are radically different in economic and technical terms from the televisions that receive their signals. This basic change in the material conditions of information and cultural production and distribution have substantial effects on how we come to know the world we occupy and the alternative courses of action open to us as individuals and as social actors. Through these effects, the emerging networked environment structures how we perceive and pursue core values in modern liberal societies.

Technology alone does not, however, determine social structure. The introduction of print in China and Korea did not induce the kind of profound religious and political reformation that followed the printed Bible and disputations in Europe. But technology is not irrelevant, either. Luther's were not the first disputations nailed to a church door. Print, however, made it practically feasible for more than 300,000 copies of Luther's publications to be circulated between 1517 and 1520 in a way that earlier disputations could not have been.⁴ Vernacular reading of the Bible became a feasible form of religious self-direction only when printing these Bibles and making them available to individual households became economically feasible, and not when all copyists were either monks or

otherwise dependent on the church. Technology creates feasibility spaces for social practice. Some things become easier and cheaper, others harder and more expensive to do or to prevent under different technological conditions. The interaction between these technological-economic feasibility spaces, and the social responses to these changes - both in terms of institutional changes, like law and regulation, and in terms of changing social practices - define the qualities of a period. The way life is actually lived by people within a given set of interlocking technological, economic, institutional, and social practices is what makes a society attractive or unattractive, what renders its practices laudable or lamentable.

A particular confluence of technical and economic changes is now altering the way we produce and exchange information, knowledge, and culture in ways that could redefine basic practices, first in the most advanced economies, and eventually around the globe. The potential break from the past 150 years is masked by the somewhat liberal use of the term "information economy" in various permutations since the 1970s. The term has been used widely to signify the dramatic increase in the importance of usable information as a means of controlling production and the flow of inputs, outputs, and services. While often evoked as parallel to the "postindustrial" stage, in fact, the information economy was tightly linked throughout the twentieth century with controlling the processes of the industrial economy. This is clearest in the case of accounting firms and financial markets, but is true of the industrial modalities of organizing cultural production as well. Hollywood, the broadcast networks, and the recording industry were built around a physical production model. Once the cultural utterances, the songs or movies, were initially produced and fixed in some means of storage and transmission, the economics of production and distribution of these physical goods took over. Making the initial utterances and the physical goods that embodied them required high capital investment up front. Making many copies was not much more expensive than making few copies, and very much cheaper on a per-copy basis. These industries therefore organized themselves to invest large sums in making a small number of high production-value cultural "artifacts," which were then either replicated and stamped onto many low-cost copies of each artifact, or broadcast or distributed through high-cost systems for low marginal cost ephemeral consumption on screens and with receivers. This required an effort to manage demand for those products that were in fact recorded and replicated or distributed, so as to make sure that the producers could sell many units of a small number of cultural utterances at a low per-unit cost, rather than few units each of many cultural utterances at higher per-unit costs. Because of its focus around capital-intensive production and distribution techniques, this first stage might best be thought of as the "industrial information economy."

Radical decentralization of intelligence in our communications network and the centrality of information, knowledge, culture, and ideas to advanced economic activity are leading to a new stage of the information economy - the networked information economy. In this new stage, we can harness many more of the diverse paths and mechanisms for cultural transmission that were muted by the economies of scale that led to the rise of the concentrated, controlled form of mass media, whether commercial or state-run. The most important aspect of the networked information economy is the possibility it opens for reversing the control focus of the industrial information economy. In particular, it holds out the possibility of reversing two trends in cultural production central to the project of control: concentration and commercialization.

Two fundamental facts have changed in the economic ecology in which the industrial information enterprises have arisen. First, the basic output that has become dominant in the most advanced economies is human meaning and communication. Second, the basic physical capital necessary to express and communicate human meaning is the connected personal computer. The core functionalities of processing, storage, and communications are widely owned throughout the

population of users. Together, these changes destabilize the industrial stage of the information economy. Both the capacity to make meaning - to encode and decode humanly meaningful statements - and the capacity to communicate one's meaning around the world, are held by, or readily available to, at least many hundreds of millions of users around the globe. Any person who has information can connect with any other person who wants it, and anyone who wants to make it mean something in some context, can do so. The high capital costs that were a prerequisite to gathering, working, and communicating information, knowledge, and culture, have now been widely distributed in the society. The entry barrier they posed no longer offers a condensation point for the large organizations that once dominated the information environment. Instead, emerging models of information and cultural production, radically decentralized and based on emergent patterns of cooperation and sharing, but also of simple coordinate coexistence, are beginning to take on an ever-larger role in how we produce meaning - information, knowledge, and culture - in the networked information economy.

A Google response to a query, which returns dozens or more sites with answers to an information question you may have, is an example of coordinate coexistence producing information. As Jessica Litman demonstrated in *Sharing and Stealing*, hundreds of independent producers of information, acting for reasons ranging from hobby and fun to work and sales, produce information, independently and at widely varying costs, related to what you were looking for. They all coexist without knowing of each other, most of them without thinking or planning on serving you in particular, or even a class of user like you. Yet the sheer volume and diversity of interests and sources allows their distributed, unrelated efforts to be coordinated - through the Google algorithm in this case, but also through many others - into a picture that has meaning and provides the answer to your question. Other, more deeply engaged and cooperative enterprises are also emerging on the Internet. Wikipedia, a multilingual encyclopedia coauthored by fifty thousand volunteers, is one particularly effective example of many such enterprises.

The technical conditions of communication and information processing are enabling the emergence of new social and economic practices of information and knowledge production. Eisenstein carefully documented how print loosened the power of the church over information and knowledge production in Europe, and enabled, particularly in the Protestant North, the emergence of early modern capitalist enterprises in the form of print shops. These printers were able to use their market revenues to become independent of the church or the princes, as copyists never were, and to form the economic and social basis of a liberal, market-based freedom of thought and communication. Over the past century and a half, these early printers turned into the commercial mass media: A particular type of market-based production-concentrated, largely homogenous, and highly commercialized - that came to dominate our information environment by the end of the twentieth century. On the background of that dominant role, the possibility that a radically different form of information production will emerge - decentralized; socially, no less than commercially, driven; and as diverse as human thought itself - offers the promise of a deep change in how we see the world around us, how we come to know about it and evaluate it, and how we are capable of communicating with others about what we know, believe, and plan.

This part of the book is dedicated to explaining the technological-economic transformation that is making these practices possible. Not because economics drives all; not because technology determines the way society or communication go; but because it is the technological shock, combined with the economic sustainability of the emerging social practices, that creates the new set of social and political opportunities that are the subject of this book. By working out the economics of these practices, we can understand the economic parameters within which practical political imagination and fulfillment can operate in the digitally networked environment. I describe sustained

productive enterprises that take the form of decentralized and nonmarket-based production, and explain why productivity and growth are consistent with a shift toward such modes of production. What I describe is not an exercise in pastoral utopianism. It is not a vision of a return to production in a preindustrial world. It is a practical possibility that directly results from our economic understanding of information and culture as objects of production. It flows from fairly standard economic analysis applied to a very nonstandard economic reality: one in which all the means of producing and exchanging information and culture are placed in the hands of hundreds of millions, and eventually billions, of people around the world, available for them to work with not only when they are functioning in the market to keep body and soul together, but also, and with equal efficacy, when they are functioning in society and alone, trying to give meaning to their lives as individuals and as social beings.

Chapter 2: Some Basic Economics of Information Production and Innovation

The Diversity of Strategies in our Current Information Production System

The Effects of Exclusive Rights

When Information Production Meets the Computer Network

Strong Exclusive Rights in the Digital Environment

Chapter 3: Peer Production and Sharing

Free/Open-Source Software

Peer Production of Information, Knowledge, and Culture Generally

Chapter 4: The Economics of Social Production

Motivation

Social Production: Feasibility Conditions and Organizational Form

Transaction Costs and Efficiency

The Emergence of Social Production in the Digitally Networked Environment

The Interface of Social Production and Market-Based Businesses

Notes

1. Elizabeth Eisenstein, *Printing Press as an Agent of Change* (Cambridge: Cambridge University Press, 1979).