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

Chapter 1
Introduction: A Moment of Opportunity and Challenge

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)*

Chapter 1
Introduction: A Moment of Opportunity and Challenge

Information, knowledge, and culture are central to human freedom and human development. How they are produced and exchanged in our society critically affects the way we see the state of the world as it is and might be; who decides these questions; and how we, as societies and polities, come to understand what can and ought to be done. For more than 150 years, modern complex democracies have depended in large measure on an industrial information economy for these basic functions. In the past decade and a half, we have begun to see a radical change in the organization of information production. Enabled by technological change, we are beginning to see a series of economic, social, and cultural adaptations that make possible a radical transformation of how we make the information environment we occupy as autonomous individuals, citizens, and members of cultural and social groups. It seems passé today to speak of "the Internet revolution." In some academic circles, it is positively naïve. But it should not be. The change brought about by the networked information environment is deep. It is structural. It goes to the very foundations of how liberal markets and liberal democracies have coevolved for almost two centuries.

A series of changes in the technologies, economic organization, and social practices of production in this environment has created new opportunities for how we make and exchange information, knowledge, and culture. These changes have increased the role of nonmarket and nonproprietary production, both by individuals alone and by cooperative efforts in a wide range of loosely or tightly woven collaborations. These newly emerging practices have seen remarkable success in areas as diverse as software development and investigative reporting, avant-garde video and multiplayer online games. Together, they hint at the emergence of a new information environment, one in which individuals are free to take a more active role than was possible in the industrial information economy of the twentieth century. This new freedom holds great practical promise: as a dimension of individual freedom; as a platform for better democratic participation; as a medium to foster a more critical and self-reflective culture; and, in an increasingly information-dependent global economy, as a mechanism to achieve improvements in human development everywhere.

The rise of greater scope for individual and cooperative nonmarket production of information and culture, however, threatens the incumbents of the industrial information economy. At the beginning of the twenty-first century, we find ourselves in the midst of a battle over the institutional ecology of the digital environment. A wide range of laws and institutions-from broad areas like telecommunications, copyright, or international trade regulation, to minutiae like the rules for registering domain names or whether digital television receivers will be required by law to recognize a particular code-are being tugged and warped in efforts to tilt the playing field toward one way of doing things or the other. How these battles turn out over the next decade or so will likely have a significant effect on how we come to know what is going on in the world we occupy, and to what extent and in what forms we will be able-as autonomous individuals, as citizens, and as participants in cultures and communities-to affect how we and others see the world as it is and as it might be.

The Emergence of the Networked Information Economy

The most advanced economies in the world today have made two parallel shifts that, paradoxically, make possible a significant attenuation of the limitations that market-based production places on the pursuit of the political values central to liberal societies. The first move, in the making for more than a century, is to an economy centered on information (financial services, accounting, software,

science) and cultural (films, music) production, and the manipulation of symbols (from making sneakers to branding them and manufacturing the cultural significance of the Swoosh). The second is the move to a communications environment built on cheap processors with high computation capabilities, interconnected in a pervasive network-the phenomenon we associate with the Internet. It is this second shift that allows for an increasing role for nonmarket production in the information and cultural production sector, organized in a radically more decentralized pattern than was true of this sector in the twentieth century. The first shift means that these new patterns of production-nonmarket and radically decentralized-will emerge, if permitted, at the core, rather than the periphery of the most advanced economies. It promises to enable social production and exchange to play a much larger role, alongside property- and market-based production, than they ever have in modern democracies.

The first part of this book is dedicated to establishing a number of basic economic observations. Its overarching claim is that we are seeing the emergence of a new stage in the information economy, which I call the "networked information economy." It is displacing the industrial information economy that typified information production from about the second half of the nineteenth century and throughout the twentieth century. What characterizes the networked information economy is that decentralized individual action-specifically, new and important cooperative and coordinate action carried out through radically distributed, nonmarket mechanisms that do not depend on proprietary strategies-plays a much greater role than it did, or could have, in the industrial information economy. The catalyst for this change is the happenstance of the fabrication technology of computation, and its ripple effects throughout the technologies of communication and storage. The declining price of computation, communication, and storage have, as a practical matter, placed the material means of information and cultural production in the hands of a significant fraction of the world's population-on the order of a billion people around the globe. The core distinguishing feature of communications, information, and cultural production since the mid-nineteenth century was that effective communication spanning the ever-larger societies and geographies that came to make up the relevant political and economic units of the day required ever-larger investments of physical capital. Large-circulation mechanical presses, the telegraph system, powerful radio and later television transmitters, cable and satellite, and the mainframe computer became necessary to make information and communicate it on scales that went beyond the very local. Wanting to communicate with others was not a sufficient condition to being able to do so. As a result, information and cultural production took on, over the course of this period, a more industrial model than the economics of information itself would have required. The rise of the networked, computer-mediated communications environment has changed this basic fact. The material requirements for effective information production and communication are now owned by numbers of individuals several orders of magnitude larger than the number of owners of the basic means of information production and exchange a mere two decades ago.

The removal of the physical constraints on effective information production has made human creativity and the economics of information itself the core structuring facts in the new networked information economy. These have quite different characteristics than coal, steel, and manual human labor, which characterized the industrial economy and structured our basic thinking about economic production for the past century. They lead to three observations about the emerging information production system. First, nonproprietary strategies have always been more important in information production than they were in the production of steel or automobiles, even when the economics of communication weighed in favor of industrial models. Education, arts and sciences, political debate, and theological disputation have always been much more importantly infused with nonmarket motivations and actors than, say, the automobile industry. As the material barrier that ultimately nonetheless drove much of our information environment to be funneled through the

proprietary, market-based strategies is removed, these basic nonmarket, nonproprietary, motivations and organizational forms should in principle become even more important to the information production system.

Second, we have in fact seen the rise of nonmarket production to much greater importance. Individuals can reach and inform or edify millions around the world. Such a reach was simply unavailable to diversely motivated individuals before, unless they funneled their efforts through either market organizations or philanthropically or state-funded efforts. The fact that every such effort is available to anyone connected to the network, from anywhere, has led to the emergence of coordinate effects, where the aggregate effect of individual action, even when it is not self-consciously cooperative, produces the coordinate effect of a new and rich information environment. One needs only to run a Google search on any subject of interest to see how the "information good" that is the response to one's query is produced by the coordinate effects of the uncoordinated actions of a wide and diverse range of individuals and organizations acting on a wide range of motivations-both market and nonmarket, state-based and nonstate.

Third, and likely most radical, new, and difficult for observers to believe, is the rise of effective, large-scale cooperative efforts-peer production of information, knowledge, and culture. These are typified by the emergence of free and open-source software. We are beginning to see the expansion of this model not only to our core software platforms, but beyond them into every domain of information and cultural production-and this book visits these in many different domains-from peer production of encyclopedias, to news and commentary, to immersive entertainment.

It is easy to miss these changes. They run against the grain of some of our most basic Economics 101 intuitions, intuitions honed in the industrial economy at a time when the only serious alternative seen was state Communism-an alternative almost universally considered unattractive today. The undeniable economic success of free software has prompted some leading-edge economists to try to understand why many thousands of loosely networked free software developers can compete with Microsoft at its own game and produce a massive operating system-GNU/Linux. That growing literature, consistent with its own goals, has focused on software and the particulars of the free and open-source software development communities, although Eric von Hippel's notion of "user-driven innovation" has begun to expand that focus to thinking about how individual need and creativity drive innovation at the individual level, and its diffusion through networks of like-minded individuals. The political implications of free software have been central to the free software movement and its founder, Richard Stallman, and were developed provocatively and with great insight by Eben Moglen. Free software is but one salient example of a much broader phenomenon. Why can fifty thousand volunteers successfully coauthor *Wikipedia,* the most serious online alternative to the *Encyclopedia Britannica*, and then turn around and give it away for free? Why do 4.5 million volunteers contribute their leftover computer cycles to create the most powerful supercomputer on Earth, SETI@Home? Without a broadly accepted analytic model to explain these phenomena, we tend to treat them as curiosities, perhaps transient fads, possibly of significance in one market segment or another. We should try instead to see them for what they are: a new mode of production emerging in the middle of the most advanced economies in the world-those that are the most fully computer networked and for which information goods and services have come to occupy the highest-valued roles.

Human beings are, and always have been, diversely motivated beings. We act instrumentally, but also noninstrumentally. We act for material gain, but also for psychological well-being and gratification, and for social connectedness. There is nothing new or earth-shattering about this, except perhaps to some economists. In the industrial economy in general, and the industrial

information economy as well, most opportunities to make things that were valuable and important to many people were constrained by the physical capital requirements of making them. From the steam engine to the assembly line, from the double-rotary printing press to the communications satellite, the capital constraints on action were such that simply wanting to do something was rarely a sufficient condition to enable one to do it. Financing the necessary physical capital, in turn, oriented the necessarily capital-intensive projects toward a production and organizational strategy that could justify the investments. In market economies, that meant orienting toward market production. In state-run economies, that meant orienting production toward the goals of the state bureaucracy. In either case, the practical individual freedom to cooperate with others in making things of value was limited by the extent of the capital requirements of production.

In the networked information economy, the physical capital required for production is broadly distributed throughout society. Personal computers and network connections are ubiquitous. This does not mean that they cannot be used for markets, or that individuals cease to seek market opportunities. It does mean, however, that whenever someone, somewhere, among the billion connected human beings, and ultimately among all those who will be connected, wants to make something that requires human creativity, a computer, and a network connection, he or she can do so-alone, or in cooperation with others. He or she already has the capital capacity necessary to do so; if not alone, then at least in cooperation with other individuals acting for complementary reasons. The result is that a good deal more that human beings value can now be done by individuals, who interact with each other socially, as human beings and as social beings, rather than as market actors through the price system. Sometimes, under conditions I specify in some detail, these nonmarket collaborations can be better at motivating effort and can allow creative people to work on information projects more efficiently than would traditional market mechanisms and corporations. The result is a flourishing nonmarket sector of information, knowledge, and cultural production, based in the networked environment, and applied to anything that the many individuals connected to it can imagine. Its outputs, in turn, are not treated as exclusive property. They are instead subject to an increasingly robust ethic of open sharing, open for all others to build on, extend, and make their own.

Because the presence and importance of nonmarket production has become so counterintuitive to people living in market-based economies at the end of the twentieth century, part I of this volume is fairly detailed and technical; overcoming what we intuitively "know" requires disciplined analysis. Readers who are not inclined toward economic analysis should at least read the introduction to part I, the segments entitled "When Information Production Meets the Computer Network" and "Diversity of Strategies in our Current Production System" in chapter 2, and the case studies in chapter 3. These should provide enough of an intuitive feel for what I mean by the diversity of production strategies for information and the emergence of nonmarket individual and cooperative production, to serve as the basis for the more normatively oriented parts of the book. Readers who are genuinely skeptical of the possibility that nonmarket production is sustainable and effective, and in many cases is an efficient strategy for information, knowledge, and cultural production, should take the time to read part I in its entirety. The emergence of precisely this possibility and practice lies at the very heart of my claims about the ways in which liberal commitments are translated into lived experiences in the networked environment, and forms the factual foundation of the political-theoretical and the institutional-legal discussion that occupies the remainder of the book.

Networked Information Economy and Liberal, Democratic Societies

How we make information, how we get it, how we speak to others, and how others speak to us are core components of the shape of freedom in any society. Part II of this book provides a detailed

look at how the changes in the technological, economic, and social affordances of the networked information environment affect a series of core commitments of a wide range of liberal democracies. The basic claim is that the diversity of ways of organizing information production and use opens a range of possibilities for pursuing the core political values of liberal societies-individual freedom, a more genuinely participatory political system, a critical culture, and social justice. These values provide the vectors of political morality along which the shape and dimensions of any liberal society can be plotted. Because their practical policy implications are often contradictory, rather than complementary, the pursuit of each places certain limits on how we pursue the others, leading different liberal societies to respect them in different patterns. How much a society constrains the democratic decision-making powers of the majority in favor of individual freedom, or to what extent it pursues social justice, have always been attributes that define the political contours and nature of that society. But the economics of industrial production, and our pursuit of productivity and growth, have imposed a limit on how we can pursue any mix of arrangements to implement our commitments to freedom and justice. Singapore is commonly trotted out as an extreme example of the trade-off of freedom for welfare, but all democracies with advanced capitalist economies have made some such trade-off. Predictions of how well we will be able to feed ourselves are always an important consideration in thinking about whether, for example, to democratize wheat production or make it more egalitarian. Efforts to push workplace democracy have also often foundered on the shoals-real or imagined-of these limits, as have many plans for redistribution in the name of social justice. Market-based, proprietary production has often seemed simply too productive to tinker with. The emergence of the networked information economy promises to expand the horizons of the feasible in political imagination. Different liberal polities can pursue different mixtures of respect for different liberal commitments. However, the overarching constraint represented by the seeming necessity of the industrial model of information and cultural production has significantly shifted as an effective constraint on the pursuit of liberal commitments.

Enhanced Autonomy

The networked information economy improves the practical capacities of individuals along three dimensions: (1) it improves their capacity to do more for and by themselves; (2) it enhances their capacity to do more in loose commonality with others, without being constrained to organize their relationship through a price system or in traditional hierarchical models of social and economic organization; and (3) it improves the capacity of individuals to do more in formal organizations that operate outside the market sphere. This enhanced autonomy is at the core of all the other improvements I describe. Individuals are using their newly expanded practical freedom to act and cooperate with others in ways that improve the practiced experience of democracy, justice and development, a critical culture, and community.

I begin, therefore, with an analysis of the effects of networked information economy on individual autonomy. First, individuals can do more for themselves independently of the permission or cooperation of others. They can create their own expressions, and they can seek out the information they need, with substantially less dependence on the commercial mass media of the twentieth century. Second, and no less importantly, individuals can do more in loose affiliation with others, rather than requiring stable, long-term relations, like coworker relations or participation in formal organizations, to underwrite effective cooperation. Very few individuals living in the industrial information economy could, in any realistic sense, decide to build a new Library of Alexandria of global reach, or to start an encyclopedia. As collaboration among far-flung individuals becomes more common, the idea of doing things that require cooperation with others becomes much more attainable, and the range of projects individuals can choose as their own therefore

qualitatively increases. The very fluidity and low commitment required of any given cooperative relationship increases the range and diversity of cooperative relations people can enter, and therefore of collaborative projects they can conceive of as open to them.

These ways in which autonomy is enhanced require a fairly substantive and rich conception of autonomy as a practical lived experience, rather than the formal conception preferred by many who think of autonomy as a philosophical concept. But even from a narrower perspective, which spans a broader range of conceptions of autonomy, at a minimum we can say that individuals are less susceptible to manipulation by a legally defined class of others-the owners of communications infrastructure and media. The networked information economy provides varied alternative platforms for communication, so that it moderates the power of the traditional mass-media model, where ownership of the means of communication enables an owner to select what others view, and thereby to affect their perceptions of what they can and cannot do. Moreover, the diversity of perspectives on the way the world is and the way it could be for any given individual is qualitatively increased. This gives individuals a significantly greater role in authoring their own lives, by enabling them to perceive a broader range of possibilities, and by providing them a richer baseline against which to measure the choices they in fact make.

Democracy: The Networked Public Sphere

The second major implication of the networked information economy is the shift it enables from the mass-mediated public sphere to a networked public sphere. This shift is also based on the increasing freedom individuals enjoy to participate in creating information and knowledge, and the possibilities it presents for a new public sphere to emerge alongside the commercial, mass-media markets. The idea that the Internet democratizes is hardly new. It has been a staple of writing about the Internet since the early 1990s. The relatively simple first-generation claims about the liberating effects of the Internet, summarized in the U.S. Supreme Court's celebration of its potential to make everyone a pamphleteer, came under a variety of criticisms and attacks over the course of the past half decade or so. Here, I offer a detailed analysis of how the emergence of a networked information economy in particular, as an alternative to mass media, improves the political public sphere. The first-generation critique of the democratizing effect of the Internet was based on various implications of the problem of information overload, or the Babel objection. According to the Babel objection, when everyone can speak, no one can be heard, and we devolve either to a cacophony or to the reemergence of money as the distinguishing factor between statements that are heard and those that wallow in obscurity. The second-generation critique was that the Internet is not as decentralized as we thought in the 1990s. The emerging patterns of Internet use show that very few sites capture an exceedingly large amount of attention, and millions of sites go unnoticed. In this world, the Babel objection is perhaps avoided, but only at the expense of the very promise of the Internet as a democratic medium.

In chapters 6 and 7, I offer a detailed and updated analysis of this, perhaps the best-known and most contentious claim about the Internet's liberalizing effects. First, it is important to understand that any consideration of the democratizing effects of the Internet must measure its effects as compared to the commercial, mass-media-based public sphere, not as compared to an idealized utopia that we embraced a decade ago of how the Internet might be. Commercial mass media that have dominated the public spheres of all modern democracies have been studied extensively. They have been shown in extensive literature to exhibit a series of failures as platforms for public discourse. First, they provide a relatively limited intake basin-that is, too many observations and concerns of too many people in complex modern societies are left unobserved and unattended to by the small cadre of commercial journalists charged with perceiving the range of issues of public

concern in any given society. Second, particularly where the market is concentrated, they give their owners inordinate power to shape opinion and information. This power they can either use themselves or sell to the highest bidder. And third, whenever the owners of commercial media choose not to exercise their power in this way, they then tend to program toward the inane and soothing, rather than toward that which will be politically engaging, and they tend to oversimplify complex public discussions. On the background of these limitations of the mass media, I suggest that the networked public sphere enables many more individuals to communicate their observations and their viewpoints to many others, and to do so in a way that cannot be controlled by media owners and is not as easily corruptible by money as were the mass media.

The empirical and theoretical literature about network topology and use provides answers to all the major critiques of the claim that the Internet improves the structure of the public sphere. In particular, I show how a wide range of mechanisms-starting from the simple mailing list, through static Web pages, the emergence of writable Web capabilities, and mobility-are being embedded in a social system for the collection of politically salient information, observations, and comments, and provide a platform for discourse. These platforms solve some of the basic limitations of the commercial, concentrated mass media as the core platform of the public sphere in contemporary complex democracies. They enable anyone, anywhere, to go through his or her practical life, observing the social environment through new eyes-the eyes of someone who could actually inject a thought, a criticism, or a concern into the public debate. Individuals become less passive, and thus more engaged observers of social spaces that could potentially become subjects for political conversation; they become more engaged participants in the debates about their observations. The various formats of the networked public sphere provide anyone with an outlet to speak, to inquire, to investigate, without need to access the resources of a major media organization. We are seeing the emergence of new, decentralized approaches to fulfilling the watchdog function and to engaging in political debate and organization. These are being undertaken in a distinctly nonmarket form, in ways that would have been much more difficult to pursue effectively, as a standard part of the construction of the public sphere, before the networked information environment. Working through detailed examples, I try to render the optimism about the democratic advantages of the networked public sphere a fully specified argument.

The networked public sphere has also begun to respond to the information overload problem, but without re-creating the power of mass media at the points of filtering and accreditation. There are two core elements to these developments: First, we are beginning to see the emergence of nonmarket, peer-produced alternative sources of filtration and accreditation in place of the market-based alternatives. Relevance and accreditation are themselves information goods, just like software or an encyclopedia. What we are seeing on the network is that filtering for both relevance and accreditation has become the object of widespread practices of mutual pointing, of peer review, of pointing to original sources of claims, and its complement, the social practice that those who have some ability to evaluate the claims in fact do comment on them. The second element is a contingent but empirically confirmed observation of how users actually use the network. As a descriptive matter, information flow in the network is much more ordered than a simple random walk in the cacophony of information flow would suggest, and significantly less centralized than the mass media environment was. Some sites are much more visible and widely read than others. This is true both when one looks at the Web as a whole, and when one looks at smaller clusters of similar sites or users who tend to cluster. Most commentators who have looked at this pattern have interpreted it as a reemergence of mass media-the dominance of the few visible sites. But a full consideration of the various elements of the network topology literature supports a very different interpretation, in which order emerges in the networked environment without re-creating the failures of the mass-media-dominated public sphere. Sites cluster around communities of interest:

Australian fire brigades tend to link to other Australian fire brigades, conservative political blogs (Web logs or online journals) in the United States to other conservative political blogs in the United States, and to a lesser but still significant extent, to liberal political blogs. In each of these clusters, the pattern of some high visibility nodes continues, but as the clusters become small enough, many more of the sites are moderately linked to each other in the cluster. Through this pattern, the network seems to be forming into an attention backbone. "Local" clusters-communities of interest-can provide initial vetting and "peer-review-like" qualities to individual contributions made within an interest cluster. Observations that are seen as significant within a community of interest make their way to the relatively visible sites in that cluster, from where they become visible to people in larger ("regional") clusters. This continues until an observation makes its way to the "superstar" sites that hundreds of thousands of people might read and use. This path is complemented by the practice of relatively easy commenting and posting directly to many of the superstar sites, which creates shortcuts to wide attention. It is fairly simple to grasp intuitively why these patterns might emerge. Users tend to treat other people's choices about what to link to and to read as good indicators of what is worthwhile for them. They are not slavish in this, though; they apply some judgment of their own as to whether certain types of users-say, political junkies of a particular stripe, or fans of a specific television program-are the best predictors of what will be interesting for them. The result is that attention in the networked environment is more dependent on being interesting to an engaged group of people than it is in the mass-media environment, where moderate interest to large numbers of weakly engaged viewers is preferable. Because of the redundancy of clusters and links, and because many clusters are based on mutual interest, not on capital investment, it is more difficult to buy attention on the Internet than it is in mass media outlets, and harder still to use money to squelch an opposing view. These characteristics save the networked environment from the Babel objection without reintroducing excessive power in any single party or small cluster of them, and without causing a resurgence in the role of money as a precondition to the ability to speak publicly.

Justice and Human Development

Information, knowledge, and information-rich goods and tools play a significant role in economic opportunity and human development. While the networked information economy cannot solve global hunger and disease, its emergence does open reasonably well-defined new avenues for addressing and constructing some of the basic requirements of justice and human development. Because the outputs of the networked information economy are usually nonproprietary, it provides free access to a set of the basic instrumentalities of economic opportunity and the basic outputs of the information economy. From a liberal perspective concerned with justice, at a minimum, these outputs become more readily available as "finished goods" to those who are least well off. More importantly, the availability of free information resources makes participating in the economy less dependent on surmounting access barriers to financing and social-transactional networks that made working out of poverty difficult in industrial economies. These resources and tools thus improve equality of opportunity.

From a more substantive and global perspective focused on human development, the freedom to use basic resources and capabilities allows improved participation in the production of information and information-dependent components of human development. First, and currently most advanced, the emergence of a broad range of free software utilities makes it easier for poor and middle-income countries to obtain core software capabilities. More importantly, free software enables the emergence of local capabilities to provide software services, both for national uses and as a basis for participating in a global software services industry, without need to rely on permission from multinational software companies. Scientific publication is beginning to use commons-based

strategies to publish important sources of information in a way that makes the outputs freely available in poorer countries. More ambitiously, we begin to see in agricultural research a combined effort of public, nonprofit, and open-source-like efforts being developed and applied to problems of agricultural innovation. The ultimate purpose is to develop a set of basic capabilities that would allow collaboration among farmers and scientists, in both poor countries and around the globe, to develop better, more nutritious crops to improve food security throughout the poorer regions of the world. Equally ambitious, but less operationally advanced, we are beginning to see early efforts to translate this system of innovation to health-related products.

All these efforts are aimed at solving one of the most glaring problems of poverty and poor human development in the global information economy: Even as opulence increases in the wealthier economies-as information and innovation offer longer and healthier lives that are enriched by better access to information, knowledge, and culture-in many places, life expectancy is decreasing, morbidity is increasing, and illiteracy remains rampant. Some, although by no means all, of this global injustice is due to the fact that we have come to rely ever-more exclusively on proprietary business models of the industrial economy to provide some of the most basic information components of human development. As the networked information economy develops new ways of producing information, whose outputs are not treated as proprietary and exclusive but can be made available freely to everyone, it offers modest but meaningful opportunities for improving human development everywhere. We are seeing early signs of the emergence of an innovation ecosystem made of public funding, traditional nonprofits, and the newly emerging sector of peer production that is making it possible to advance human development through cooperative efforts in both rich countries and poor.

A Critical Culture and Networked Social Relations

The networked information economy also allows for the emergence of a more critical and self-reflective culture. In the past decade, a number of legal scholars-Niva Elkin Koren, Terry Fisher, Larry Lessig, and Jack Balkin-have begun to examine how the Internet democratizes culture. Following this work and rooted in the deliberative strand of democratic theory, I suggest that the networked information environment offers us a more attractive cultural production system in two distinct ways: (1) it makes culture more transparent, and (2) it makes culture more malleable. Together, these mean that we are seeing the emergence of a new folk culture-a practice that has been largely suppressed in the industrial era of cultural production-where many more of us participate actively in making cultural moves and finding meaning in the world around us. These practices make their practitioners better "readers" of their own culture and more self-reflective and critical of the culture they occupy, thereby enabling them to become more self-reflective participants in conversations within that culture. This also allows individuals much greater freedom to participate in tugging and pulling at the cultural creations of others, "glomming on" to them, as Balkin puts it, and making the culture they occupy more their own than was possible with mass-media culture. In these senses, we can say that culture is becoming more democratic: self-reflective and participatory.

Throughout much of this book, I underscore the increased capabilities of individuals as the core driving social force behind the networked information economy. This heightened individual capacity has raised concerns by many that the Internet further fragments community, continuing the long trend of industrialization. A substantial body of empirical literature suggests, however, that we are in fact using the Internet largely at the expense of television, and that this exchange is a good one from the perspective of social ties. We use the Internet to keep in touch with family and intimate friends, both geographically proximate and distant. To the extent we do see a shift in social

ties, it is because, in addition to strengthening our strong bonds, we are also increasing the range and diversity of weaker connections. Following Manuel Castells and Barry Wellman, I suggest that we have become more adept at filling some of the same emotional and context-generating functions that have traditionally been associated with the importance of community with a network of overlapping social ties that are limited in duration or intensity.

Four Methodological Comments

There are four methodological choices represented by the thesis that I have outlined up to this point, and therefore in this book as a whole, which require explication and defense. The first is that I assign a very significant role to technology. The second is that I offer an explanation centered on social relations, but operating in the domain of economics, rather than sociology. The third and fourth are more internal to liberal political theory. The third is that I am offering a liberal political theory, but taking a path that has usually been resisted in that literature-considering economic structure and the limits of the market and its supporting institutions from the perspective of freedom, rather than accepting the market as it is, and defending or criticizing adjustments through the lens of distributive justice. Fourth, my approach heavily emphasizes individual action in nonmarket relations. Much of the discussion revolves around the choice between markets and nonmarket social behavior. In much of it, the state plays no role, or is perceived as playing a primarily negative role, in a way that is alien to the progressive branches of liberal political thought. In this, it seems more of a libertarian or an anarchistic thesis than a liberal one. I do not completely discount the state, as I will explain. But I do suggest that what is special about our moment is the rising efficacy of individuals and loose, nonmarket affiliations as agents of political economy. Just like the market, the state will have to adjust to this new emerging modality of human action. Liberal political theory must first recognize and understand it before it can begin to renegotiate its agenda for the liberal state, progressive or otherwise.

The Role of Technology in Human Affairs

The first methodological choice concerns how one should treat the role of technology in the development of human affairs. The kind of technological determinism that typified Lewis Mumford, or, specifically in the area of communications, Marshall McLuhan, is widely perceived in academia today as being too deterministic, though perhaps not so in popular culture. The contemporary effort to offer more nuanced, institution-based, and political-choice-based explanations is perhaps best typified by Paul Starr's recent and excellent work on the creation of the media. While these contemporary efforts are indeed powerful, one should not confuse a work like Elizabeth Eisenstein's carefully argued and detailed *The Printing Press as an Agent of Change*, with McLuhan's determinism. Assuming that technologies are just tools that happen, more or less, to be there, and are employed in any given society in a pattern that depends only on what that society and culture makes of them is too constrained. A society that has no wheel and no writing has certain limits on what it can do. Barry Wellman has imported into sociology a term borrowed from engineering-affordances./1 Langdon Winner called these the "political properties" of technologies./2 An earlier version of this idea is Harold Innis's concept of "the bias of communications."/3 In Internet law and policy debates this approach has become widely adopted through the influential work of Lawrence Lessig, who characterized it as "code is law."/4

The idea is simple to explain, and distinct from a naïve determinism. Different technologies make different kinds of human action and interaction easier or harder to perform. All other things being equal, things that are easier to do are more likely to be done, and things that are harder to do are less likely to be done. All other things are never equal. That is why technological determinism in the

strict sense-if you have technology "t," you should expect social structure or relation "s" to emerge-is false. Ocean navigation had a different adoption and use when introduced in states whose land empire ambitions were effectively countered by strong neighbors-like Spain and Portugal-than in nations that were focused on building a vast inland empire, like China. Print had different effects on literacy in countries where religion encouraged individual reading-like Prussia, Scotland, England, and New England-than where religion discouraged individual, unmediated interaction with texts, like France and Spain. This form of understanding the role of technology is adopted here. Neither deterministic nor wholly malleable, technology sets some parameters of individual and social action. It can make some actions, relationships, organizations, and institutions easier to pursue, and others harder. In a challenging environment-be the challenges natural or human-it can make some behaviors obsolete by increasing the efficacy of directly competitive strategies. However, within the realm of the feasible-uses not rendered impossible by the adoption or rejection of a technology-different patterns of adoption and use can result in very different social relations that emerge around a technology. Unless these patterns are in competition, or unless even in competition they are not catastrophically less effective at meeting the challenges, different societies can persist with different patterns of use over long periods. It is the feasibility of long-term sustainability of different patterns of use that makes this book relevant to policy, not purely to theory. The same technologies of networked computers can be adopted in very different patterns. There is no guarantee that networked information technology will lead to the improvements in innovation, freedom, and justice that I suggest are possible. That is a choice we face as a society. The way we develop will, in significant measure, depend on choices we make in the next decade or so.

The Role of Economic Analysis and Methodological Individualism

It should be emphasized, as the second point, that this book has a descriptive methodology that is distinctly individualist and economic in orientation, which is hardly the only way to approach this problem. Manuel Castells's magisterial treatment of the networked society/5locates its central characteristic in the shift from groups and hierarchies to networks as social and organizational models-looser, flexible arrangements of human affairs. Castells develops this theory as he describes a wide range of changes, from transportation networks to globalization and industrialization. In his work, the Internet fits into this trend, enabling better coordination and cooperation in these sorts of loosely affiliated networks. My own emphasis is on the specific relative roles of market and nonmarket sectors, and how that change anchors the radical decentralization that he too observes, as a matter of sociological observation. I place at the core of the shift the technical and economic characteristics of computer networks and information. These provide the pivot for the shift toward radical decentralization of production. They underlie the shift from an information environment dominated by proprietary, market-oriented action, to a world in which nonproprietary, nonmarket transactional frameworks play a large role alongside market production. This newly emerging, nonproprietary sector affects to a substantial degree the entire information environment in which individuals and societies live their lives. If there is one lesson we can learn from globalization and the ever-increasing reach of the market, it is that the logic of the market exerts enormous pressure on existing social structures. If we are indeed seeing the emergence of a substantial component of nonmarket production at the very core of our economic engine-the production and exchange of information, and through it of information-based goods, tools, services, and capabilities-then this change suggests a genuine limit on the extent of the market. Such a limit, growing from within the very market that it limits, in its most advanced loci, would represent a genuine shift in direction for what appeared to be the ever-increasing global reach of the market economy and society in the past half century.

Economic Structure in Liberal Political Theory

The third point has to do with the role of economic structure in liberal political theory. My analysis in this regard is practical and human centric. By this, I mean to say two things: First, I am concerned with human beings, with individuals as the bearers of moral claims regarding the structure of the political and economic systems they inhabit. Within the liberal tradition, the position I take is humanistic and general, as opposed to political and particular. It is concerned first and foremost with the claims of human beings as human beings, rather than with the requirements of democracy or the entitlements of citizenship or membership in a legitimate or meaningfully self-governed political community. There are diverse ways of respecting the basic claims of human freedom, dignity, and well-being. Different liberal polities do so with different mixes of constitutional and policy practices. The rise of global information economic structures and relationships affects human beings everywhere. In some places, it complements democratic traditions. In others, it destabilizes constraints on liberty. An understanding of how we can think of this moment in terms of human freedom and development must transcend the particular traditions, both liberal and illiberal, of any single nation. The actual practice of freedom that we see emerging from the networked environment allows people to reach across national or social boundaries, across space and political division. It allows people to solve problems together in new associations that are outside the boundaries of formal, legal-political association. In this fluid social economic environment, the individual's claims provide a moral anchor for considering the structures of power and opportunity, of freedom and well-being. Furthermore, while it is often convenient and widely accepted to treat organizations or communities as legal entities, as "persons," they are not moral agents. Their role in an analysis of freedom and justice is derivative from their role-both enabling and constraining-as structuring context in which human beings, the actual moral agents of political economy, find themselves. In this regard, my positions here are decidedly "liberal," as opposed to either communitarian or critical.

Second, I am concerned with actual human beings in actual historical settings, not with representations of human beings abstracted from their settings. These commitments mean that freedom and justice for historically situated individuals are measured from a first-person, practical perspective. No constraints on individual freedom and no sources of inequality are categorically exempt from review, nor are any considered privileged under this view. Neither economy nor cultural heritage is given independent moral weight. A person whose life and relations are fully regimented by external forces is unfree, no matter whether the source of regimentation can be understood as market-based, authoritarian, or traditional community values. This does not entail a radical anarchism or libertarianism. Organizations, communities, and other external structures are pervasively necessary for human beings to flourish and to act freely and effectively. This does mean, however, that I think of these structures only from the perspective of their effects on human beings. Their value is purely derivative from their importance to the actual human beings that inhabit them and are structured-for better or worse-by them. As a practical matter, this places concern with market structure and economic organization much closer to the core of questions of freedom than liberal theory usually is willing to do. Liberals have tended to leave the basic structure of property and markets either to libertarians-who, like Friedrich Hayek, accepted its present contours as "natural," and a core constituent element of freedom-or to Marxists and neo-Marxists. I treat property and markets as just one domain of human action, with affordances and limitations. Their presence enhances freedom along some dimensions, but their institutional requirements can become sources of constraint when they squelch freedom of action in nonmarket contexts. Calibrating the reach of the market, then, becomes central not only to the shape of justice or welfare in a society, but also to freedom.

Whither the State?

The fourth and last point emerges in various places throughout this book, but deserves explicit note here. What I find new and interesting about the networked information economy is the rise of individual practical capabilities, and the role that these new capabilities play in increasing the relative salience of nonproprietary, often nonmarket individual and social behavior. In my discussion of autonomy and democracy, of justice and a critical culture, I emphasize the rise of individual and cooperative private action and the relative decrease in the dominance of market-based and proprietary action. Where in all this is the state? For the most part, as you will see particularly in chapter 11, the state in both the United States and Europe has played a role in supporting the market-based industrial incumbents of the twentieth-century information production system at the expense of the individuals who make up the emerging networked information economy. Most state interventions have been in the form of either captured legislation catering to incumbents, or, at best, well-intentioned but wrongheaded efforts to optimize the institutional ecology for outdated modes of information and cultural production. In the traditional mapping of political theory, a position such as the one I present here-that freedom and justice can and should best be achieved by a combination of market action and private, voluntary (not to say charitable) nonmarket action, and that the state is a relatively suspect actor-is libertarian. Perhaps, given that I subject to similar criticism rules styled by their proponents as "property"-like "intellectual property" or "spectrum property rights"-it is anarchist, focused on the role of mutual aid and highly skeptical of the state. (It is quite fashionable nowadays to be libertarian, as it has been for a few decades, and more fashionable to be anarchist than it has been in a century.)

The more modest truth is that my position is not rooted in a theoretical skepticism about the state, but in a practical diagnosis of opportunities, barriers, and strategies for achieving improvements in human freedom and development given the actual conditions of technology, economy, and politics. I have no objection in principle to an effective, liberal state pursuing one of a range of liberal projects and commitments. Here and there throughout this book you will encounter instances where I suggest that the state could play constructive roles, if it stopped listening to incumbents for long enough to realize this. These include, for example, municipal funding of neutral broadband networks, state funding of basic research, and possible strategic regulatory interventions to negate monopoly control over essential resources in the digital environment. However, the necessity for the state's affirmative role is muted because of my diagnosis of the particular trajectory of markets, on the one hand, and individual and social action, on the other hand, in the digitally networked information environment. The particular economics of computation and communications; the particular economics of information, knowledge, and cultural production; and the relative role of information in contemporary, advanced economies have coalesced to make nonmarket individual and social action the most important domain of action in the furtherance of the core liberal commitments. Given these particular characteristics, there is more freedom to be found through opening up institutional spaces for voluntary individual and cooperative action than there is in intentional public action through the state. Nevertheless, I offer no particular reasons to resist many of the roles traditionally played by the liberal state. I offer no reason to think that, for example, education should stop being primarily a state-funded, public activity and a core responsibility of the liberal state, or that public health should not be so. I have every reason to think that the rise of nonmarket production enhances, rather than decreases, the justifiability of state funding for basic science and research, as the spillover effects of publicly funded information production can now be much greater and more effectively disseminated and used to enhance the general welfare.

The important new fact about the networked environment, however, is the efficacy and centrality of individual and collective social action. In most domains, freedom of action for individuals, alone

and in loose cooperation with others, can achieve much of the liberal desiderata I consider throughout this book. From a global perspective, enabling individuals to act in this way also extends the benefits of liberalization across borders, increasing the capacities of individuals in nonliberal states to grab greater freedom than those who control their political systems would like. By contrast, as long as states in the most advanced market-based economies continue to try to optimize their institutional frameworks to support the incumbents of the industrial information economy, they tend to threaten rather than support liberal commitments. Once the networked information economy has stabilized and we come to understand the relative importance of voluntary private action outside of markets, the state can begin to adjust its policies to facilitate nonmarket action and to take advantage of its outputs to improve its own support for core liberal commitments.

The Stakes of It All: The Battle Over the Institutional Ecology of the Digital Environment

No benevolent historical force will inexorably lead this technological-economic moment to develop toward an open, diverse, liberal equilibrium. If the transformation I describe as possible occurs, it will lead to substantial redistribution of power and money from the twentieth-century industrial producers of information, culture, and communications-like Hollywood, the recording industry, and perhaps the broadcasters and some of the telecommunications services giants-to a combination of widely diffuse populations around the globe, and the market actors that will build the tools that make this population better able to produce its own information environment rather than buying it ready-made. None of the industrial giants of yore are taking this reallocation lying down. The technology will not overcome their resistance through an insurmountable progressive impulse. The reorganization of production and the advances it can bring in freedom and justice will emerge, therefore, only as a result of social and political action aimed at protecting the new social patterns from the incumbents' assaults. It is precisely to develop an understanding of what is at stake and why it is worth fighting for that I write this book. I offer no reassurances, however, that any of this will in fact come to pass.

The battle over the relative salience of the proprietary, industrial models of information production and exchange and the emerging networked information economy is being carried out in the domain of the institutional ecology of the digital environment. In a wide range of contexts, a similar set of institutional questions is being contested: To what extent will resources necessary for information production and exchange be governed as a commons, free for all to use and biased in their availability in favor of none? To what extent will these resources be entirely proprietary, and available only to those functioning within the market or within traditional forms of well-funded nonmarket action like the state and organized philanthropy? We see this battle played out at all layers of the information environment: the physical devices and network channels necessary to communicate; the existing information and cultural resources out of which new statements must be made; and the logical resources-the software and standards-necessary to translate what human beings want to say to each other into signals that machines can process and transmit. Its central question is whether there will, or will not, be a core common infrastructure that is governed as a commons and therefore available to anyone who wishes to participate in the networked information environment outside of the market-based, proprietary framework.

This is not to say that property is in some sense inherently bad. Property, together with contract, is the core institutional component of markets, and a core institutional element of liberal societies. It is what enables sellers to extract prices from buyers, and buyers to know that when they pay, they will be secure in their ability to use what they bought. It underlies our capacity to plan actions that require use of resources that, without exclusivity, would be unavailable for us to use. But property

also constrains action. The rules of property are circumscribed and intended to elicit a particular datum-willingness and ability to pay for exclusive control over a resource. They constrain what one person or another can do with regard to a resource; that is, use it in some ways but not others, reveal or hide information with regard to it, and so forth. These constraints are necessary so that people must transact with each other through markets, rather than through force or social networks, but they do so at the expense of constraining action outside of the market to the extent that it depends on access to these resources.

Commons are another core institutional component of freedom of action in free societies, but they are structured to enable action that is not based on exclusive control over the resources necessary for action. For example, I can plan an outdoor party with some degree of certainty by renting a private garden or beach, through the property system. Alternatively, I can plan to meet my friends on a public beach or at Sheep's Meadow in Central Park. I can buy an easement from my neighbor to reach a nearby river, or I can walk around her property using the public road that makes up our transportation commons. Each institutional framework-property and commons-allows for a certain freedom of action and a certain degree of predictability of access to resources. Their complementary coexistence and relative salience as institutional frameworks for action determine the relative reach of the market and the domain of nonmarket action, both individual and social, in the resources they govern and the activities that depend on access to those resources. Now that material conditions have enabled the emergence of greater scope for nonmarket action, the scope and existence of a core common infrastructure that includes the basic resources necessary to produce and exchange information will shape the degree to which individuals will be able to act in all the ways that I describe as central to the emergence of a networked information economy and the freedoms it makes possible.

At the physical layer, the transition to broadband has been accompanied by a more concentrated market structure for physical wires and connections, and less regulation of the degree to which owners can control the flow of information on their networks. The emergence of open wireless networks, based on "spectrum commons," counteracts this trend to some extent, as does the current apparent business practice of broadband owners not to use their ownership to control the flow of information over their networks. Efforts to overcome the broadband market concentration through the development of municipal broadband networks are currently highly contested in legislation and courts. The single most threatening development at the physical layer has been an effort driven primarily by Hollywood, over the past few years, to require the manufacturers of computation devices to design their systems so as to enforce the copyright claims and permissions imposed by the owners of digital copyrighted works. Should this effort succeed, the core characteristic of computers-that they are general-purpose devices whose abilities can be configured and changed over time by their owners as uses and preferences change-will be abandoned in favor of machines that can be trusted to perform according to factory specifications, irrespective of what their owners wish. The primary reason that these laws have not yet passed, and are unlikely to pass, is that the computer hardware and software, and electronics and telecommunications industries all understand that such a law would undermine their innovation and creativity. At the logical layer, we are seeing a concerted effort, again headed primarily by Hollywood and the recording industry, to shape the software and standards to make sure that digitally encoded cultural products can continue to be sold as packaged goods. The Digital Millennium Copyright Act and the assault on peer-to-peer technologies are the most obvious in this regard.

More generally information, knowledge, and culture are being subjected to a second enclosure movement, as James Boyle has recently explored in depth. The freedom of action for individuals who wish to produce information, knowledge, and culture is being systematically curtailed in order

to secure the economic returns demanded by the manufacturers of the industrial information economy. A rich literature in law has developed in response to this increasing enclosure over the past twenty years. It started with David Lange's evocative exploration of the public domain and Pamela Samuelson's prescient critique of the application of copyright to computer programs and digital materials, and continued through Jessica Litman's work on the public domain and digital copyright and Boyle's exploration of the basic romantic assumptions underlying our emerging "intellectual property" construct and the need for an environmentalist framework for preserving the public domain. It reached its most eloquent expression in Lawrence Lessig's arguments for the centrality of free exchange of ideas and information to our most creative endeavors, and his diagnoses of the destructive effects of the present enclosure movement. This growing skepticism among legal academics has been matched by a long-standing skepticism among economists (to which I devote much discussion in chapter 2). The lack of either analytic or empirical foundation for the regulatory drive toward ever-stronger proprietary rights has not, however, resulted in a transformed politics of the regulation of intellectual production. Only recently have we begun to see a politics of information policy and "intellectual property" emerge from a combination of popular politics among computer engineers, college students, and activists concerned with the global poor; a reorientation of traditional media advocates; and a very gradual realization by high-technology firms that rules pushed by Hollywood can impede the growth of computer-based businesses. This political countermovement is tied to quite basic characteristics of the technology of computer communications, and to the persistent and growing social practices of sharing-some, like p2p (peer-to-peer) file sharing, in direct opposition to proprietary claims; others, increasingly, are instances of the emerging practices of making information on nonproprietary models and of individuals sharing what they themselves made in social, rather than market patterns. These economic and social forces are pushing at each other in opposite directions, and each is trying to mold the legal environment to better accommodate its requirements. We still stand at a point where information production could be regulated so that, for most users, it will be forced back into the industrial model, squelching the emerging model of individual, radically decentralized, and nonmarket production and its attendant improvements in freedom and justice.

Social and economic organization is not infinitely malleable. Neither is it always equally open to affirmative design. The actual practices of human interaction with information, knowledge, and culture and with production and consumption are the consequence of a feedback effect between social practices, economic organization, technological affordances, and formal constraints on behavior through law and similar institutional forms. These components of the constraints and affordances of human behavior tend to adapt dynamically to each other, so that the tension between the technological affordances, the social and economic practices, and the law are often not too great. During periods of stability, these components of the structure within which human beings live are mostly aligned and mutually reinforce each other, but the stability is subject to shock at any one of these dimensions. Sometimes shock can come in the form of economic crisis, as it did in the United States during the Great Depression. Often it can come from an external physical threat to social institutions, like a war. Sometimes, though probably rarely, it can come from law, as, some would argue, it came from the desegregation decision in *Brown v. Board of Education*. Sometimes it can come from technology; the introduction of print was such a perturbation, as was, surely, the steam engine. The introduction of the high-capacity mechanical presses and telegraph ushered in the era of mass media. The introduction of radio created a similar perturbation, which for a brief moment destabilized the mass-media model, but quickly converged to it. In each case, the period of perturbation offered more opportunities and greater risks than the periods of relative stability. During periods of perturbation, more of the ways in which society organizes itself are up for grabs; more can be renegotiated, as the various other components of human stability adjust to the changes. To borrow Stephen Jay Gould's term from evolutionary theory, human societies exist in a

series of punctuated equilibria. The periods of disequilibrium are not necessarily long. A mere twenty-five years passed between the invention of radio and its adaptation to the mass-media model. A similar period passed between the introduction of telephony and its adoption of the monopoly utility form that enabled only one-to-one limited communications. In each of these periods, various paths could have been taken. Radio showed us even within the past century how, in some societies, different paths were in fact taken and then sustained over decades. After a period of instability, however, the various elements of human behavioral constraint and affordances settled on a new stable alignment. During periods of stability, we can probably hope for little more than tinkering at the edges of the human condition.

This book is offered, then, as a challenge to contemporary liberal democracies. We are in the midst of a technological, economic, and organizational transformation that allows us to renegotiate the terms of freedom, justice, and productivity in the information society. How we shall live in this new environment will in some significant measure depend on policy choices that we make over the next decade or so. To be able to understand these choices, to be able to make them well, we must recognize that they are part of what is fundamentally a social and political choice-a choice about how to be free, equal, productive human beings under a new set of technological and economic conditions. As economic policy, allowing yesterday's winners to dictate the terms of tomorrow's economic competition would be disastrous. As social policy, missing an opportunity to enrich democracy, freedom, and justice in our society while maintaining or even enhancing our productivity would be unforgivable.

Notes

1. Barry Wellman et al., "The Social Affordances of the Internet for Networked Individualism," *JCMC* 8, no. 3 (April 2003).

2. Langdon Winner, ed., "Do Artifacts Have Politics?" in *The Whale and The Reactor: A Search for Limits in an Age of High Technology* (Chicago: University of Chicago Press, 1986), 19-39.

3. Harold Innis, *The Bias of Communication* (Toronto: University of Toronto Press, 1951). Innis too is often lumped with McLuhan and Walter Ong as a technological determinist. His work was, however, one of a political economist, and he emphasized the relationship between technology and economic and social organization, much more than the deterministic operation of technology on human cognition and capability.

4. Lawrence Lessig, *Code and Other Laws of Cyberspace* (New York: Basic Books, 1999).

5. Manuel Castells, *The Rise of Networked Society* (Cambridge, MA, and Oxford: Blackwell Publishers, 1996).