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Contemporary Technology Discourse and the Legitimation of Capitalism

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Abstract
At the center of contemporary discourse on technology – or the digital discourse – is the assertion that network technology ushers in a new phase of capitalism which is more democratic, participatory, and de-alienating for individuals. Rather than viewing this discourse as a transparent description of the new realities of techno-capitalism and judging its claims as true (as the hegemonic view sees it) or false (a view expressed by few critical voices), this article offers a new framework which sees the digital discourse as signaling a historical shift in the technological legitimation of capitalism, concurrent with the emergence of the post-Fordist phase of capitalism. Technology discourse legitimated the Fordist phase of capitalism by stressing the ability of technology and technique to mitigate exploitation. It hence legitimated the interventionist welfare state, the central planning in businesses and the economy, the hierarchized corporation, and the tenured worker. In contrast, contemporary technology discourse legitimates the post-Fordist phase of capitalism by stressing the ability of technology to mitigate alienation. It hence legitimates the withdrawal of the state from markets, the dehierarchization and decentralization of businesses, and the flexibilization of production and the labor process.

Keywords
capitalism, information technology, legitimation, post-Fordism, technology discourse, Critical Theory

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Locating the Digital Discourse

The past four decades have witnessed two extraordinary transformations in advanced societies. One is the transformation of capitalism from Fordism to post-Fordism, involving changes not only in the regime of accumulation – i.e., in how production is carried out, where, and by whom – but also in the mode of social regulation, entailing a whole set of political arrangements and cultural practices. This has been a deep social transformation: globalization, the 'new economy', Google, outsourcing, 'just-in-time' production, the rise of India – these are just few of the new keywords in the lexicon of the new capitalism. The other transformation was the emergence of network technology (or information and communication technology) and its integration into virtually every sphere of life. This has been nothing short of a technological revolution: globalization, the 'new economy', Google, outsourcing, 'just-in-time' production, the rise of India; indeed, many of the keywords in the lexicon of the new technology parallel those of the new capitalism.

The question then arises: What is the nature of this close affinity between a new capitalism and a new technology? The answer seems straightforward: a new technology enables a new society. This outlook reflects a prevailing assumption: that technology makes society. According to this view, to talk about digital technology is both transparent and instructive. Transparent since the discourse on technology is merely a reflection of the realities of digital technology (to say, for example, that network technology allows flexibility and interactivity is to merely speak the truth); and instructive, since to talk about technology is ultimately to describe the operation of society (for example, flexible technology creates a flexible economy). This, however, is a partial understanding of technology discourse; technology discourse is not a transparent vignette on reality and is therefore worthy of analysis in its own right. To substantiate this argument, we first need to locate this mode of analysis – i.e., analyzing technology discourse – within the broader field of the social study of technology.

Technology and Society

Three theoretical approaches have been proposed to account for the relations between technology and society. The most prevalent approach is that *technology shapes society*, thus framing the inquiry in terms of the effects of technology on society. Underlying this 'technologistic' approach (Robins and Webster, 1999) are two assumptions: *neutrality* – technology has a history of its own, its development stems from its internal dynamics, and it is therefore an a-social force, external to social power struggles (Bijker, 1995; Feenberg, 1995; Robins and Webster, 1985); and *inevitability* – technology determines the shape of society, reconfiguring it in accordance with its internal workings (Feenberg, 1991; Smith and Marx, 1994; Winner, 1977).

The uncovering and overcoming of these problematic assumptions (often denounced as 'technological determinism') have underpinned critical approaches to technology, which suggest that *society shapes technology*. Such approaches seek to introduce social coordinates into the analysis of technology construction, dissemination, and use. These critical approaches share 'an insistence that the "black-box" of technology must be opened, to allow the socio-economic patterns embedded in both the content of

technologies and the processes of innovation to be exposed and analyzed' (Williams and Edge, 1996). Likewise, late Marxist analysis has been particularly fruitful in uncovering the extent to which technologies of production have been the means in the arsenal of class struggle, rather than mere implementation of universal instrumental rationality (Aronowitz and DiFazio, 1994; Braverman, 1974; Huws, 2003; Noble, 1984).

Despite the contrast between these two approaches, both share an engagement with technology as an instrument. The third intervention into the relations between technology and society, and the one that informs this article, focuses on *technology as discourse* – cultural, social, political, and ideological. According to this approach, the discourse on technology is not simply a reflection of the centrality of technology in the operation of modern societies; instead, it plays a constitutive role in their operation, and enables precisely that centrality. Some see technology discourse as a form of 'projection' (Heffernan, 2000) of social realities, or a 'technological vision' (Sturken and Thomas, 2004), through which transformations of political, economic and social nature are filtered. Thus, for example, the emerging technology of the mechanical clock in seventeenth-century Europe played a central role as a metaphor and cognitive framework to deliberate the ideological debate between authoritarian and liberal conceptions of political order (Mayr, 1986).

A stronger version of that approach sees technology discourse as assuming a more active role in the construction of reality, a reality which it presumes merely to describe. Here, technology discourse is seen as central in shaping the political, cultural, and social *Zeitgeist*. Nye, for example, argues that the *American Technological Sublime* – the reverence of technology in and of itself – has become at the turn of the twentieth century 'one of America's central 'ideas about itself'' (Nye, 1994: xiv), functioning to reaffirm and bind multicultural individuals into a society by celebrating and admiring technological achievements in the public sphere. Technology discourse played an equally central role in the construction of nationalistic culture in Germany's Third Reich, where technological rationality was co-opted by irrational politics to create a political culture of *Reactionary Modernism* (Herf, 1984), with technology helping to define the emerging German national-fascist identity. And lastly, the emergence of the discourse on *The Human Motor* (Rabinbach, 1992) during the nineteenth century was interwoven with scientific and technological transformations: The scientific 'discovery' of the laws of energy was central to a revolution in the perception of humans as containers of energy, leading to new practices, such as Taylorism, which in effect rendered the human body a 'motor' and mobilized it to the mechanical process of mass production.

The Discourse on Technology as Legitimation Discourse

The strongest version of this approach to the social study of technology sees technology discourse as a particular outlook, an ideology. According to this view – developed particularly by members of the Frankfurt School as part of a broader critique of instrumental reason – with modernity, and specifically with the harnessing of science and technology to the needs of capitalism and the modern state, technology discourse has come to play a central role in the legitimation of a techno-political order, i.e., a political order that is legitimated by technology and techniques. In this political context, technology becomes

an unquestionable 'good', a 'religion' (Noble, 1999), and a 'myth' (Robins and Webster, 1999: 151; Mosco, 2004) which suggests that virtually any social problem is subject to a technical and technological fix (Aronowitz, 1994; Segal, 1985). The idea (indeed, ideal) of technology gains in itself a constitutive role in society, becoming the point of departure and the yardstick against which other realms of society are examined and worked out; technology becomes 'both means and the ends, the instrument of progress but also its fulfillment' (Robins and Webster, 1999: 151). In short, with modernity, 'Technology has become not just the material basis for society but in a real sense its social and ideological model as well' (Segal, 1994: 3).

Furthermore, technology functions as an 'ideological tool that mystif[ies] mechanisms of power and domination' (Best and Kellner, 2000), and is 'one of the major sources of public power in modern societies', commonly used as an alibi 'to justify what are in reality relations of force' (Feenberg, 1995). One of the most eloquent theoretizations of the ideological functions of technology discourse is offered by Jürgen Habermas (1970). Habermas points to the substitution of technical and technological discussions with their emphasis on instrumental rationality, for political debate, which is based on communicative action and aimed at arriving at substantive rationality (see also Feenberg, 1991; Marcuse, 1964; Pippin, 1995). In his early seminal article 'Technology and science as ''ideology''', Habermas (1970) lays out a history of capitalist legitimation, whereby a legitimation based on the internal workings of the market (as articulated in neoclassical economics) is replaced by a political legitimation with the emergence of the Keynesian welfare state and the central planning of the economy. From this point onward, political practice is measured in terms of the technical problems at hand, rather than in substantive terms. The role of politics is reduced to finding the technical means to achieve goals (e.g., economic growth) that in themselves are understood to lie outside the realm of politics (Habermas, 1970: 100–3). Technology discourse is 'ideological' to the extent that political issues are treated as technical ones: tensions and contradictions are overcome by delimiting the scope of the political, and as a result the instrumental rationality of technical language colonizes the sphere of politics.

Habermas's notion of technology discourse as legitimation discourse, then, puts forward two arguments: (1) a general argument regarding the depoliticizing ramifications of a technologistic consciousness; and (2) a historically-specific argument regarding the legitimation of capitalism in its Keynesian stage, or in our terminology here, in its Fordist phase. This article offers both a *revival* of the general argument and an *updating* of the historically-specific argument. A revival is needed because the role of technology discourse in the legitimation of contemporary society is not less, perhaps more central than it has been in the past.[1] An updating is called for because the historical circumstances which inform Habermas's thesis have since changed: both capitalism and the dominant technological paradigm have gone through sweeping transformations. I shall describe them briefly in the next section.

Transformations in Capitalism

The past few decades have been marked by transformations in capitalism pertaining to how production is carried out, where and by whom. According to one dominant view, the

restructuring of capitalism was the result of the crisis in the mode of capital accumulation which had reigned in Western capitalist societies since the 1930s and came to be known as Fordism, and its substitution by an emergent phase of a more flexible mode of capitalist accumulation, post-Fordism (Aglietta, 2001; Boyer, 2002). Post-Fordism entails a shift from mass production to 'just-in-time' production and mass customization (Harvey, 1990), and from the large-scale, hierarchized, and centralized corporation that controls all aspects of production to lean, decentralized production, with a core company that outsources most facets of production to other, small and mid-size companies (Castells, 1996). The process of production has also become global, involving a global division of labor, and run by multinational corporations. Lastly, flexibility has also come to dominate the labor process both at the micro-level, with workers asked to switch between multiple tasks and ad-hoc projects, and at the macro-level, involving more flexible and precarious employment schemes (Bauman, 2000; Castells, 1996; Greenbaum, 1995; Jessop, 1994; Sennett, 2000, 2006). Concurrent with the new regime of accumulation arose a form of social regulation, which encompasses not only the mode of production, but also 'a facilitating shell' (Fraser, 2003) of economic, social, and political arrangements, cultural and artistic sensibilities, the world of ideas and bodies of knowledge, everyday life experiences, and the conception of the individual in this society. Following Gramsci (1971), we can therefore speak of a post-Fordist *society*.

The shift to a post-Fordist society entails a transformation in the relations among three key actors: capital, the state, and labor. Fordist society was characterized by a strong social compact between capital and labor within the framework of a strong state. Capital made concessions to labor in the form of high wages, job security, and high levels of employment; labor conceded to capital's needs by curbing its most militant demands for a radical social revolution, and providing capital with labor power for production and consumption power to purchase increasing volumes of products. The state gained political legitimacy from both groups by transforming itself into an interventionist, Keynesian, welfare state, which protected capitalism from both internal failures and an external overthrow and at the same time provided a buffer zone between labor and the possibly harsh realities of markets (by providing social services and installing various security schemes), hence further embedding markets in society. Appropriately, Fordist society was dominated in advanced capitalist societies by a political culture of social democracy (Harvey, 2005; Offe, 1984; Polanyi, 2001; Ram, 2007: Ch. 3).

Post-Fordist society is characterized by a new constellation of power among these three actors, with capital gaining increased independence from both labor and the state. This has brought about all but the demise of the Fordist social compact. Capital has become more mobile and global, detached from particular localities and polities, leaving labor weaker. The state, likewise, lost much of its leverage to exert control over capital which now operates in a global free market, and reacted by measures of self-discipline – deregulation, privatization, and downsizing. As labor became weaker vis-à-vis capital, it all but evaporated discursively, institutionally, and sociologically in Western societies. The power of 'the working class' as a frame of reference for political mobilization or for the construction of political identity has been diluted, as was the power of the labor movement and big unions. Collective bargaining was replaced by individual contracts, and tenured, long-term employment schemes were replaced by untenured, temporal ones

(Bauman, 2001; Beck, 2000; Piven and Cloward, 1997). Post-Fordist society is appropriately dominated by a political culture of neoliberalism (Harvey, 2005).

The emergence of the new capitalism has been closely intertwined with a transformation in the dominant technology system from mechanical and centralized to informational and networked. The networked organization (Castells, 1996), the command and control of headquarters in a global chain of production (Harvey, 1990; Robins and Webster, 1999), 'just-in-time' production (Harvey, 1990), the expansion in space of production, distribution, and consumption processes (Beniger, 1986), the flexibilization of the work process (Greenbaum, 1995; Robins and Webster, 1999) – network technology has been instrumental in bringing about and materializing all these changes, which is precisely why so many have called ours the information, or network society (Barney, 2004; Bell, 1999; Castells, 1996; Duff, 2000; Lash, 2002; Mackay, 2003; Mattelart, 2003; May, 2002; Robins and Webster, 1999, Stehr, 2001; Webster, 2002).

This article argues that the emergence of a new capitalism and a new technology has been accompanied by the rise of a new technology discourse which offers a new type of legitimation to capitalism. During the Fordist phase of capitalism, technology discourse extolled the capacity of technology to enhance social goals of security, stability, and equality by mitigating the *exploitative* nature of capitalism. In contrast, during the contemporary post-Fordist phase of capitalism, technology discourse extols the capacity of technology to enhance individual goals of personal empowerment, authenticity, and creativity by mitigating the *alienating* nature of capitalism. By this move from the mitigation of exploitation to the mitigation of alienation, I further suggest, contemporary technology discourse legitimates new constellations of power entailed by the new capitalism, at the heart of which is the weakening of labor and the state vis-à-vis capital, the liberalization of markets, the privatization of work, and the flexibilization of employment.

Previous analyses have already pointed to the ideological functions of contemporary technology discourse (Aune, 2001; Barbrook and Cameron, 1996; Best and Kellner, 2000; Borsook, 2000; Dean, 2002; Frank, 2000; Gere, 2002; Mosco, 2004; Turner, 2006; Wajcman, 2004). Such analyses tend to present contemporary technology discourse as false, utopian, or mythical. Thus, for example, Frank argues that information technology came to be 'The most powerful symbolic weapon in the arsenal of market populism' (2000: 57), with the Internet specifically providing 'a sort of cosmic affirmation of the principles of market populism' (2000: 79). And Aune concludes that the digital discourse played a decisive role in the ideological struggle of *Selling the Free Market* (Aune, 2001: Ch. 7) during the 1980s and 1990s. Such analyses assert contemporary technology discourse to be an ideology of the free market, according to which network technology is leading to 'the *apotheosis of the market* – an electronic exchange within which everybody can become a free trader' (Barbrook and Cameron, 1996), that is, as embodying an ideal of the free market (Robins and Webster, 1999: 67). Likewise, in *The Digital Sublime*, Mosco understands the digital discourse as *the* myth of our time. By insisting on digital technology as ushering in a historical break, it 'mask[s] the continuities that make the power we observe today ... in the global market . . . very much a deepening and extension of old forms of power' (Mosco, 2004: 83).

Such works, then, analyze the digital discourse as an ideology in the Marxist sense of the term: an ideational veil which conceals material contradictions. While such an

approach is insightful in its own right, it also misses an aspect of the digital discourse which I would like to highlight in my analysis. Rather than assessing the *truth value* of the claims made by the digital discourse, I will endeavor to decipher the particular historical form that such discourse assumes and assess its *legitimation value*. Analyzing the digital discourse as a sociological unit of analysis in its own right (that is, as a social reality, rather than simply a report on social reality) will give us insight into the particular form which technology discourse assumes. Such an analysis will show the dual character of contemporary technology discourse, which at one and the same time promises an overcoming of the alienating components of capitalism because of its integration with network technology *and* a naturalization and de-politicization of the continuation, and even exacerbation of its exploitative components.

I opt for the concept of 'discourse' (rather than 'ideology') to highlight the productive role of technology discourse in the construction of reality. Technology discourse is a cognitive map (Jameson, 1991), or an episteme (Foucault, 1994), i.e., a body of knowledge that is inextricably intertwined with technological reality, social structures, and everyday practices. Unlike 'ideology', 'discourse' does not imply the imposition of false ideas on reality in order to plaster over social contradictions; instead, it suggests a dialectical relation between ideas and (material) reality: the one constituting and affirming the other, until eventually discourse and reality are hard to distinguish both in discourse and in reality (Scott, 1988). Located at the intersection of capitalism and technology, then, my analysis offers a critique of a technologically-centered discourse – which renders social relations technological and a-political – that facilitates the emergence of post-Fordist capitalism. As such, it is not a critique of post-Fordism *per se*, but an attempt to highlight the ideological logic of contemporary capitalism as it is projected on technology.

The Digital Discourse

By investigating the new technology discourse, then, this article seeks to register the dominant narratives and keywords used to account for the emergent realities of contemporary capitalism, and explain the hegemonic and legitimatory dimensions of this new discursive universe. The digital discourse is a hegemonic body of knowledge that explains the structure and dynamics of contemporary society as arising from the structure and dynamics of network technology, or information and communication technology.[2] The inherent characteristics of network technology are seen in the digital discourse as paradigmatically different from those of previous dominant technologies, and hence as socially transformative. The general tone of the digital discourse towards these transformations is located on the spectrum between optimistic and euphoric: the overall trend of technological advancement is seen as universally progressive, and problems – which are acknowledged at times – are promised to be resolved, usually by further integrating network technology into social systems and practices. A network civilization is ultimately a more benevolent civilization.

The digital discourse can be thought of as a popular articulation of a few intellectual traditions, most notably postindustrialism, postmodernism, and posthumanism. Like them, the digital discourse also postulates a radical historical break brought about by

technology and information. For the postindustrialists, the determining role of knowledge, information, and technology in the productive process, and the corollary decline of the working class and rise of a technocratic elite – bent on (universal) rational planning rather than (particular) class loyalties – lead to the substitution of a rational-technocratic political sphere for the ideological politics of class struggle, and to the strengthening of civil society (Bell, 1976, 1999; Touraine, 1971). For the postmodernists, the dissociation between signifier and signified, and the constitution of an 'empire of signs' (Barthes, 1982), a 'hyperreality' (Baudrillard, 1983) '*media*-ted' (Lash, 2002) by network technology is at the heart of the shift to a new 'mode of information' (Poster, 1990). Like the postindustrialists, they too uphold the emancipatory potential of this informational transformation: liberation from grand narratives, from essentialist and authoritarian bodies of knowledge, from metaphysical ontologies, and from the overdetermination of signs (Baudrillard, 1981; Lyotard, 1984). In the same vein, posthumanists extol the constitution of new subjects. The informationalization of the body and the networking of identities make the construction of one's identity more negotiated and indeterminate, and allow the overcoming of essentialist categories. This, in turn, opens up new opportunities for equality, especially for previously underprivileged subjectivities, such as women (Haraway, 1991, 1997; Hayles, 1999; Turkle, 1997). Hence, postindustrialists, postmodernists, and posthumanists all locate network technology at the heart of a radical break in social life which helps transcend what they deem to be the Achilles heel of industrialism, modernism, and humanism, respectively. They all thus find network technology to offer relief from the various pathologies of alienation.

Likewise, at the heart of the digital discourse[3] is the notion of networks, not simply as a technological paradigm, but as the paradigmatic architecture of social action in contemporary society.[4] Network technology is seen as the bedrock of late capitalism and as the watershed between one social form and the next.[5] As a legitimation discourse for contemporary capitalism, we can discern the arguments of the digital discourse with regard to four sites at the juncture of network technology and capitalism – market, work, production, and humans.[6] The integration of network technology into these sites – and the respective construction of network market, network work, network production and the network human – create, according to the digital discourse, a new form of capitalism. In what follows, I delineate the central narratives of the digital discourse and highlight how they constitute a new legitimation discourse. Specifically, I will show that the digital discourse constructs contemporary capitalism as an overcoming of the pitfalls of Fordism (and at times industrialism in general) in terms of alienation. In such a discourse, I will argue, the pitfalls of capitalism in terms of exploitation, are either neutralized, ignored, or accepted as indispensable or inevitable components of this new capitalism.

Network Market

The digital discourse extols the enhanced capacity of markets to be self-regulated and self-governed. Networks foster spontaneous order,[7] an order (rational and benevolent) which emerges bottom-up without any centralized planning, external governance, or oversight. Power in the network is distributed rather than concentrated;[8] its particles can be assembled by individual nodes by way of smart mobs[9] in order to bring about desired

outcomes.[10] By facilitating new, bottom-up formations of meaningful action, based on disparate nodes, networks contribute to individual empowerment.[11] Top-down management – of either private companies or national economies – becomes not only unnecessary, but also unfeasible because the lack of centralized planning and oversight yields a market system that is bent, and in fact thrives on perpetual flux;[12] network markets are inherently unstable, unpredictable, and nonlinear.[13] These characteristics, in turn, make network markets more dynamic, allowing for more openings, and hence more opportunities to come about. Network markets allow for the friction-free[14] and streamlined flow of substance, and for smoother interaction between disparate nodes, relieved from the hindrance of regulatory obstacles.[15] To survive and thrive in the ecology of network markets, nodes must respond with adaptability.[16] They must let go of any claim to stability, anchors, and constants, and replace them with flexibility. Networks therefore are defined by project-specific, ad-hoc assemblages of nodes, rather than established groups and structures.[17]

The discourse on the network market, I suggest, represents a fundamental shift in the political culture of contemporary capitalist societies, from a technology discourse that legitimates social democracy to one that legitimates neoliberalism. The digital discourse lends legitimacy to political power to withdraw from the central management of the economy. The increasing autonomy of markets from society, and their resulting volatility are seen in the digital discourse as stemming from network technology, as benevolent, and as transcending the shortcomings of the Keynesian welfare state. The legitimation of the central planning on the economy – epitomized in Keynesian policies – and the embeddedness of markets in society (Polanyi, 2001) rested on the ability of these practices to mitigate exploitation. Furthermore, the technology discourse of the dominant technological systems during Fordism – centralized and expensive machinery with high output volumes, which in turn demanded market predictability and stable labor relations – further cemented a legitimation based on the mitigation of exploitation. In contrast, the legitimacy of a deregulated market, privatized social institutions, and marketized social relations now rests on the ability of these practices to mitigate alienation by allowing individuals more opportunities to engage directly with the market. These practices are seen as facilitated and guaranteed by the internal workings of network technology, such as spontaneous order, bottom-up rationality, and market democratization. At that same time, the implications of these practices in terms of exacerbating exploitation – by dismantling the social safety net which served as a buffer zone between individuals and the market – are neutralized and accepted. Furthermore, the technology discourse of contemporary dominant technological systems – decentralized and distributed with a capacity for flexibility, which in turn requires flexible working relations – further cements a legitimation that is unresponsive to concerns of exploitation.

Network Work

According to the digital discourse, network technology not only perfects the operation of markets, it also completely transforms the world of work. The introduction of network technology renders the workplace decentralized and dehierarchized.[18] It de-

differentiates between various echelons in the workplace, thus rendering it flat. Power relations in the network workplace are determined based on criteria of professionalism and meritocracy, not on ownership of the means of production or lack thereof.[19] Power relations are therefore not fixed and pre-determined but change according to the particular task at hand, and the skills it requires. The multiple actors who once populated the workplace (the boss, the worker, the manager, the CEO) have been replaced by a single classless actor in the network workplace: the digerati.

The digerati is able to multi-task, flexibly shift between different projects and deploy different skills. The worker-turned-digerati is expected to be entrepreneurial – not a cog in the machine, but a node among competing nodes in the network.[20] The capitalist-turned-digerati is interested in the advance of technology more than in the accumulation of capital. All the digerati are seen as ontologically the same: passionate about technological progress, and deploying their technological expertise, rather than their financial prowess, to command power. The digerati is adverse to command, bureaucracy, and hierarchy, and tends to be anti-establishment, contrarian and critical.[21]

Network technology facilitates the conflation of work and leisure, of productive-time and free-time, of office-space and home-space, of public and private activities. On the one hand, this means that work is ever-present and can be performed anywhere and anytime. On the other hand, with networks, the very nature of work changes; networks allow the reintegration of play, joy, and passion into the reproduction of society.[22] These novelties allow workers to bring their personal, lifeworld qualities of creativity, and deep personal engagement to bear on their work activities, and re-eroticize the disenchanted world of work. Network work does away with the bureaucratic, gray, stifling organization, and creates an airy, de-bureaucratized, and de-compartmentalized structure of work.

The discourse on network work, I argue, signals a radical break from the technology discourse on work alienation in the bureaucratized Fordist organization. Network technology is seen in the digital discourse as the pivotal axis of rendering work, i.e., the work process, work relations, and the workplace, more humane and liberating for the worker. At the level of social structure, the discourse on network work also signals a shift from a Fordist discourse of class to a post-Fordist discourse of networks. In the discourse of networks, individuals are construed as autonomous nodes and defined by their connections to other nodes in the network; the social is seen as a flat, decentralized sphere of ever-flowing, multiple, and ad-hoc assemblages. This is in stark contrast to the Fordist conception of the social sphere as consisting of a hierarchized, stable, and category-defined arena. The notion of network work and its grounding in a technological reality allows for the substitution of a hierarchical, competitive, and antagonistic model of class by a de-hierarchized, cooperative, agreeable, and inherently inclusive model of networks.

The discourse on network work embodies a technologistic response to the critique of Fordist capitalism, centered on industrial technology, and built on top-down control, authority, hierarchy and centralization. The digerati is seen as embodying a rejection of Fordist hierarchy between workers and capitalists in the workplace and in society at large. The work process is seen as a site of emancipation and personal freedom rather than alienation, and network technology is rendered an axis through which social tensions are alleviated.

Network Production

Network technology also brings about a new mode of production, according to the digital discourse. Network technology creates a productive space which allows the de-differentiation between previously well-demarcated structures – 'corporations', 'capitalists', 'workers', and so forth – and their reconstruction as homologous nodes of prosumption and entrepreneurship in the network of production.[23] Networks allow each of its nodes easy access to participate in production, and for collaboration among them.[24] Networks allow the de-alienation of the productive process; creativity, self-expression, personal idiosyncrasies, authenticity, passion, hobbies, and individualism – all are seen as new forces of production, assets to be harnessed to wealth creation.[25] Network production is conducive to the expression of personal characteristics, and hence allows more individual freedom and authenticity. Networks are a space of self-realization *through* production, allowing the inversion of the alienation which dominated industrial production.

De-alienation takes place in another way as well: network technology allows individuals to encounter products not simply as docile producers, and not just as passive consumers of a mass society, but as prosumers, which entails enhanced control over the processes of production and consumption, and deep engagement with them. Such engagement is epitomized in the notion of interactivity, and in techniques such as mass-customization, personalization, and social production.[26]

According to the digital discourse, network production – flat and dehierarchized – is inherently participatory, inclusive, and democratic.[27] This is epitomized by the technique and ethics of open source.[28] The inclusive tendencies of open source and social production,[29] in general,[30] also make the network inherently populist, empowering the 'little guys', underprivileged, and off-centered.[31] The ad-hoc and fleeting assemblages which characterize the network, and the lack of long-term stability within institutions, make collaboration between nodes the prime mode of action, replacing competition.[32] At the same time that networks allow collaboration around a project, they also help maintain the autonomy of each node, since they are not pressured to assimilate into established structures.

Technology discourse on network production, I suggest, further legitimates the new realities and constellations of power entailed by this new mode of production, specifically regarding work, by emphasizing the capacity of network capitalism to alleviate alienation, while at the same time obliterating concerns and critiques centered on the mitigation of exploitation. 'Work' in the digital discourse is reconceptualized as an eroticized, playful activity of prosumption, involving creativity, deep engagement, interactivity, and inter-personal communication.

Alongside, the institutions where the social organization of work during Fordism (and through much of industrialism) were contained and anchored – the company, the union, the guild, the professional, the cadre – are rendered obsolete with the emergence of the prosumer. At the same time that work becomes more meaningful and humane, allowing greater outlet for personal potential, and harnessing amateurish skills and leisure time into social reproduction, it also becomes more privatized and individualized, shifting more risks from capital to labor, and dismantling the social buffer zone offered during

Fordism – a buffer zone which promised to enhance social equity and personal security. In the digital discourse, network technology is portrayed as making the production process more democratic and engaging and at the same time undermining the institutional arrangements which made those processes more stable and protective.

The re-construction of workers as prosumers also lends legitimacy to the privatization of work. The seemingly ad-hoc, contractual, egalitarian, and de-hierarchized relations which characterize market relations are transplanted into the relations of production. And so workers are reconceptualized as nodes in the network, equal to all other nodes, entrepreneurial, and competing on the shared and leveled playing field of the network.

Network production is therefore constructed as offering a transcendence of the pitfalls of industrial production: hierarchy between producers, on the one hand, and consumers and workers on the other hand, alienation of the worker from the work process, suppression of creativity and personal expression, the massification of production and consumption, and so forth. This narrative follows the pattern of the digital discourse we have already observed: at one and the same an affirmation of the capacity of network technology to enhance de-alienation *and* a suppression and exclusion of concerns regarding the exploitative nature of capitalism. In other words, at the same time that contemporary technology discourse promises more engaging roles for individuals in the process of production, it also accepts and legitimates the individualization, atomization, and privatization of work life. As it promises more flexibility and creativity, it also legitimates greater precariousness, instability, and vulnerability.

More than that, according to the digital discourse, the demands for de-alienation and individual emancipation – such as decentralization, dehierarchization, de-bureaucratization, and individual empowerment and satisfaction (i.e., criteria judged by the *conditions* of the labor process) – go hand in hand with the traditional (and indispensable) demands of capitalism for profitability (judged by the quality and quantity of the *product* of the labor process). In fact, through the axis of network production, these two demands are now seen as mutually constitutive: More productivity *demands* individual freedom, it demands that creativity and personal expression be brought to bear on the productive process as new forces of production. At the same time, it also demands the atomization of workers, their adaptability and flexibility, their entrepreneurship, and so forth. In other words, the digital discourse shows network technology to be a means that improves capitalism in two senses: it gives better responses to the internal demands inherent in capitalism (i.e., the endless accumulation of capital) while at the same time it changes how capitalism works so as to alleviate the alienating tendencies of capitalist production.

This interlinking of rationalization with de-alienation is a key ideological component of contemporary technology discourse. By providing a technological resolution that speaks to both system and lifeworld, the digital discourse presents network technology as playing a central role in reducing and even eliminating class antagonism, which dominated industrial capitalism. On the one hand, it answers to the systemic demands of the economy – rationality, productivity, and growth – by facilitating a mode of production which is more rational and efficient, and mustering new productive forces, such as creativity and personal expression. On the other hand, network technology also answers the demands of lifeworld through a new mode of production which is more de-alienating.

Network Human

Finally, according to the digital discourse, network technology revolutionizes society because for the first time since the industrial revolution technology is compatible with human essence. The architecture and characteristics of network technology – based on binary information, communication, flexibility, adaptability, and so forth – echo the essence of humans. Because network technology resonates with the true essence of humans, it is particularly conducive in helping to reconstruct a more authentic human experience.

Like networks, humans too are seen as informational, multiple and fragmented. Networks allow for a better commensurability and deeper interaction between humans and technology. Through the integration of humans and technology, and the construction of the cyborg, the engagement of humans with the world becomes more meaningful and allows greater degrees of freedom. Networks free humans by affirming and augmenting their non-essentialism. As they are integrated into networks, their self, identity, and experience are distributed among multiple nodes: websites, servers, applications, avatars, and so forth. Being part of the network, humans shift swiftly and easily between multiple tasks: they are flexible and can engage with reality based on only superficial, temporary, and fleeting encounters. With network technology, humans – themselves informational and comprised of a network of components – can be dis-assembled, distributed, and re-assembled in order to create a new whole.[33]

The discourse on the network human, I suggest, embodies an overcoming of the shortcomings of Fordist society in terms of alienation, specifically in regard to authenticity, creativity, and self-expression. In the digital discourse, the relationship between humans and network technology (resulting in the network human) is set in contrast with the relationship of humans and industrial technology (resulting in the industrial human). While allowing smoother integration of humans into the industrial machine, the construction of the industrial human is seen in retrospect as a hindrance to human emancipation because industrial technology did not resonate with the true essence of humans, and in fact suppressed it. The interaction of humans with machines during Industrialism followed the rigid rationale of centralized command and control; it was not in fact *inter*action at all. In the best case, humans utilized technology by command; in the worst case, humans themselves were co-opted into technology, becoming cogs in the machine. With network technology humans have a much deeper interaction with technology, resulting in fusion, integration, and merging, and the construction of a new subjectivity, which fosters a more meaningful and emancipatory interaction with technology.

While celebrating the mitigation of alienation, the digital discourse also legitimates a conception of humans which is conducive to, or at least unresponsive to, the exploitative nature of capitalism. Humans are rendered perfectly compatible with the emergent capitalism and the new social arrangements it entails. In other words, network market, network work, and network production require the reconceptualization of humans as commensurable with network technology, as informational, flexible, and distributed, and as nodes in a techno-human network. The new flexible and network capitalism demands that workers insistently move between multiple tasks and ad-hoc projects which require multiple and varying skills. The old work ethics

of a long apprenticeship and ever-deepening craftsmanship in a single skill (Sennett, 2000: Ch, 6, 2006: Ch. 2) is therefore replaced by an ethics of superficiality and multiplicity, which is seen in the digital discourse as a sign of a more liberated, de-alienated, and authentic person.

The digital discourse extols the power of network technology to construct a new human that transcends the industrial human. Informationalization, disembodiment, distribution, fragmentation, inessentiality, instability, flexibility, interactivity, play – these are precisely the authentic qualities – associated with a demand for de-alienation – that industrial-mechanical technology suppressed, and can now be unleashed and flourish thanks to network technology.

The Spirit of Networks: From Mitigating Exploitation to Mitigating Alienation

I suggest we understand the discourse that was presented above not as a simple description of the realities of network capitalism, but as a discourse that legitimates – through a 'technologistic' framework – the new constellations of power entailed by the new stage of capitalism. At the center of this discourse, I argue, is the promise, anchored in network technology, of capitalism to enhance individual emancipation by alleviating alienation, and the concurrent suppression of the promise to enhance social emancipation by alleviating exploitation, which was a staple of the legitimation discourse on technology during Fordism.

As mentioned above, the history of technology discourse as a legitimation discourse begins with the harnessing of science and technology to capitalist development in the context of the modern state, roughly since the rise of industrial capitalism. The digital discourse should therefore be understood precisely in that context, by locating it not only on the horizon of a *technological* change – from mechanical and centralized industrial technology to a digital and networked post-industrial technology – and not only by locating it on the horizon of the transformation of *capitalism* – from a Fordist phase to a post-Fordist phase – but also by locating it in the context of the *ideological* transformations that have accompanied these changes.

At the beginning of the twentieth century Max Weber pointed out in his seminal work the central role of the ideological component, or 'spirit', in the rise of capitalism. At the close of that century, and in one of the definitive works on the network society, Manuel Castells postulates the emergence of the 'spirit of informationalism' as the cultural bedrock on which the network enterprise and informational capitalism operate (Castells, 1996: 195–200). The aim of this article has been to chart this new spirit and uncover its ideological underpinnings. Concurrent with structural and technological transformations, the rise of the new capitalism also entails transformations in the legitimation function of technology discourse. Under conditions of a flexible regime of accumulation, globalization, neoliberalism, deregulation, privatization, and the dismantling of the welfare state, technology discourse no longer legitimates the interventionist welfare state, the central planning in businesses and the economy, the hierarchized corporation, and the tenured worker; instead it legitimates the withdrawal of the state from markets, the

globalization of the economy, the dehierarchization and decentralization of businesses, and the flexibilization of production and the labor process.

This new legitimation discourse of technology marks a transformation in the 'spirit of capitalism' from its industrial phase, which emphasized the capacity of capitalism to bring about *social emancipation* by alleviating exploitation, to its post-industrial 'spirit of networks' phase, which focuses on capitalism's capacity to enhance *individual emancipation*, by alleviating alienation.

The distinction between two types of emancipation – social and individual – is based on a longstanding tradition in the social sciences, most recently evoked in *The New Spirit of Capitalism* by Boltanski and Chiapello (2005) who distinguish between two threads of discontent from, and critique of capitalism: a 'social critique', focused on the harmful consequences of capitalism to the social body, i.e., exploitation and inequality; and an 'artistic critique', focused on the harmful consequences of capitalism to the person, i.e., alienation and inauthenticity.[34]

Boltanski and Chiapello (2005) argue that the new spirit of capitalism has been constructed as a response to the 'artistic critique' of capitalism while suppressing the 'social critique' of capitalism. Notwithstanding the scope of their analysis, they ignore the role of technology discourse in the legitimation of the new capitalism. Put differently, while they promise to examine the 'ideological changes that have accompanied recent transformations in capitalism' (2005: 3), they neglect to account for the changes in the ideology of technology that have accompanied these transformations.

My argument is that the new spirit of capitalism is inextricably linked with network technology discourse; hence my term: the 'spirit of networks'. The spirit of networks should be understood as a technologistic response to concerns put forth by the 'artistic critique', concerned with individual emancipation, that became influential in the 1960s, offering an overcoming of the technological, institutional, and social shortcomings of Fordism. The spirit of networks therefore marks a watershed in the legitimation function of technology discourse.

During the Fordist phase of capitalism, technological discourse legitimated a socio-economic regime of accumulation which responded to concerns of social emancipation, while downplaying and even trampling upon concerns for individual emancipation. Industrial technology, the assembly line, the bureaucratic corporation, the statist regulation of the economy, and the provision of welfare, were all conceived in the technology discourse during Fordism as technologies and techniques that respond to concerns put forth by the 'social critique' of capitalism, such as the need for social security, stability, and equality, i.e., they were geared towards mitigating exploitation.

The critique of Fordism, to which the 'spirit of networks' responds, therefore, targets precisely the oppressive nature of the administered state and the bureaucratic corporation, the loss of personal authenticity, and the de-eroticization of the productive process, that is, the harmful ramifications of the 'social' underpinnings of Fordism in terms of personal alienation. Their amelioration has in fact become the centerpiece of the spirit of networks which emerged in the post-Fordism phase of capitalism. With post-Fordism, technology discourse legitimates a new socio-economic regime which is construed as responding to concerns for individual emancipation, while simultaneously downplaying concerns for social emancipation. Network technology, the lean and

flexible corporation, and flexible modes of production and employment are all conceived in contemporary technology discourse, presented above, as major technological components that respond to concerns put forth by the 'artistic critique' of capitalism, such as the need for individual empowerment, authenticity, and creativity, i.e., they are geared towards mitigating alienation.

In that context, network technology is constructed in contemporary technology discourse as amending the pitfalls of Fordist production by responding to concerns regarding individual emancipation and harnessing those human facets that have been suppressed during Fordism – individualism, authenticity, creativity, personal expression, and so forth – into the productive process. However, at the same time that network technology responds to these individual demands, it is also construed as requiring the downplaying and even rejection of concerns for social emancipation, the response for which has been epitomized by job tenure, employment security, embedded markets, and the provision of welfare and social security, which characterized Fordist society. The spirit of networks then offers a new trade-off between the societal and the individual, between socially-backed security and individual opportunity, between long-term stability and liberating flexibility; in short, between the social *safety net* which characterized (in ideology, if not always in practice) the Fordist, Keynesian, welfare state, and the promise of the *internet* for personal liberation and de-alienation (Fisher, 2007a).

While technology discourse during Fordism was used to legitimize the social-wide compact between capital, labor, and the state, technology discourse during post-Fordism legitimizes precisely the decomposition of this compact and the constitution of its alternative: privatized relations within the context of a global market and civil society. While Fordism extolled the power of the old technology in the name of social equality and stability as a public and political project, post-Fordism extols the power of the new technology in the name of individual authenticity and liberation as a private and a-political enterprise. The new characteristics of capitalism powered by network technology – flexibility, adaptability, temporality, spontaneity, and so forth – are constructed in contemporary technology discourse as characteristics which at one and the same time promise individual emancipation and negate the possibility for social emancipation.

Technology discourse should not be understood as a *post facto* idyllic legitimation of new material conditions, but as a discourse which enables and facilitates the emergence of such conditions. Post-Fordist social relations are *not* the inevitable social consequences of technological innovations (which indeed create the conditions of possibility for such relations) but the result also of discursive practices which have made such social transformations seem natural, neutral and inevitable, precisely because they are presented as ultimately technological. In other words, the digital discourse emerges not as a result of but *concurrently* with technological, material, and social transformations.

This also implies that it is possible to contemplate alternative technology discourses; it *is* possible to think about network technology differently. Indeed, recent social theory has pointed out that network discourse has the potential to be critical and constructivist, even anti-capitalist. Hardt and Negri (2001, 2005), for example, conceive of a decentralized, network-like 'empire', and hope that the atomized, non-essentialized nodes of the 'multitude' come together in meaningful political action. Dyer-Witheford (1999) notes

that the network structure of global capitalism offers openings for a reconstitution of labor struggles. And Fuchs (2008) theorizes the internet as facilitating two dialectically antagonistic tendencies of competition and cooperation. The hegemonic competitive form of contemporary social relations thrives on the network structure of the internet but also gives rise to an emerging cooperative potentiality.

The introduction of multiple possibilities would indeed transfer much of the weight of social change from a deterministic view of technology to a political understanding of the possibilities of technology to usher in *different* kinds of societies and hence would accentuate the role of agents (classes, states, bureaucracies etc.) in the creation of a new constellation of power. Such a presentation – missing from the hegemonic technology discourse presented above – would have highlighted the political dimension of this new society.

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Notes

1. One indicator for the abundance of technology discourse in the public sphere is the institutionalization of a regular feature on technology in all major newspapers. The flood of popular nonfiction books about the social meaning of technology in recent years is another testament. Some prominent titles in that genre include: Battle, (2005); Anderson (2006a); Benkler (2006); Crumlish (2004); Jonscher (1999); Johnson(2002); Kelly (1995, 1998); Kessler (2006); Kurzweil (2000, 2005); Mitchell,(2004); Moravec (1999); Oram (2001); Perseus Publishing (2002); Reynolds (2006); Scoble and Israel (2006).
2. The term 'network technology' seems to me more appropriate than 'information and communication technology', because it alludes to the networked nature of social processes in contemporary society, and underlines the most significant novelty of the dominant technology paradigm, which is neither the ability to translate reality into information, nor the ability to transfer this information between different nodes through communication channels, but precisely the creation of networks: social, economic, political, and so forth (see Barney, 2000, 2004; Castells, 1996; Fuchs, 2008).
3. The following summary of the digital discourse is based on both a review of popular books on digital technology, and on a discourse analysis of Wired magazine, one of the most consistent and crystallized articulations of the digital discourse. Inaugurated in 1993, Wired has published more than 180 monthly issues to date – each holding some 250 pages – with current circulation of approximately 700,000 in the United States. Wired grew out of, and indeed concurrently with the dot-com bubble, the explosion of digital technology and the Internet, and the emergence of the high-tech industry as a central engine in the economy and a powerful source of identity and culture. Wired is located both socially and geographically at the heart of the revolution it purports to report on: new technologies, new businesses, new people, and new media; Wired, in other words, is also part of that revolution, 'the mouthpiece of the digital revolution' as the magazine's founder readily admits (Wolf, 2003: 52).

4. The emergence of networks as the centerpiece of the digital revolution is encapsulated in terms such as 'second-generation Web' (Anderson, 2006b), 'Web 2.0' (Levy, 2005), and 'the cloud' (Tanz, 2007).
5. See Jonscher (1999); Johnson (2002); Buchanan (2002); Barabasi, (2003); Rheingold (2003); Taylor (2003); and Kelly (1995).
6. The demarcation into four 'areas' of the digital discourse is merely presentational, the line between them is hard to draw in reality.
7. For details, see Strogatz, (2003), Regis (1994), Postrel (1998), and Kelly (1993).
8. See, in this respect, Anderson (2002); Luman (2005); and Leslie (1997).
9. For details, see Rheingold (2003);Sterling (2005); and Kelly (2005).
10. Examples include: Dorigo (2004); Negroponte (1997); Kelly (1997); Wienberger (2008); Bonabeau, Dorigo, and Theraulaz (1999); Surowiecki (2004); and Kelly (1998).
11. Refer to Susstein (2006); Reynolds (2006); and Crumlish (2004).
12. Examples include: Kelly (1998: 108ff); Hughes (1994); Browning and Reiss (1998).
13. See Meyer (2004).
14. This is advocated by Gates(2000).
15. See Wriston (1992); and Gilder (1989).
16. According to Schwartz and Kelly (1996); Glenny (2001).
17. For this, see Kelly (1999).
18. On this, see Copland (1994).
19. A point made by Schwartz (1993).
20. See Bronson (2003).
21. For details, see Borsook (1996); Heilemann (2001).
22. Architect's view in Koolhaas (2003).
23. See Bronson (2003).
24. Friedman (2000, 2005) expounds this well.
25. See Platt (2000).
26. These include Kelly (2005); Goetz (2003); Howe (2006); Koerner (2006); Anderson (2006a); and Scoble and Israel (2006).
27. See Von Hippel (2006).
28. For more, see Benkler (2006); Lessig (2006).
29. Popular examples for social production include Blogs, Wikipedia, Linux, and YouTube.
30. Examples include Oram (2001); Perseus Publishing (2002); Stone Biz (2004); Kline and Burstein (2005).
31. For more, see Shirky (2008); Keen(2007).
32. This is discussed by Tapscott and Williams (2008).
33. See Kunzru (1997); Brown (2004); and Kurzweil (2000, 2005).
34. Indeed, the notion of a dual critique of capitalism is deeply rooted in the history of social thought: Marx's concept of exploitation (the extraction of surplus-value) very much concurs with the social critique, while his notion of alienation (particularly that which emerges between workers and their labor process and between workers and their species-being) falls under the rubric of the social critique; Marcuse's notion of the de-erotization of the work process, and more generally the introduction of psychoanalysis into the analysis of modern society by the Frankfurt School, informs much of the humanist critique; Weber's lament of the

disenchantment of the world, brought about by the iron cage, or rational-instrumental bureaucracy echoes humanist themes; finally, in response to postmodern concerns with identity, these two types of critique have been re-articulated as demands of redistribution and recognition (Fraser and Honneth, 2003).

References

Aglietta M (2001) *A Theory of Capitalist Regulation: The US Experience*. New York: Verso.

Anderson C (2002) Spam-Haters of the World Unite!, *Wired*, September.

—— (2006a) *The Long Tail: Why the Future of Business Is Selling Less of More*. New York: Hyperion.

—— (2006b) People Power, *Wired*, July.

Aronowitz S (1994) Technology and the Future of Work, in G Bender and T Druckrey (eds) *Culture on the Brink: Ideologies of Technology*. Seattle: Bay Press.

Aronowitz S and DiFazio W (1994) *The Jobless Future: Sci-Tech and the Dogma of Work*. Minneapolis: University of Minnesota Press.

Aune J A (2001) *Selling the Free Market: The Rhetoric of Economic Correctness*. New York: The Guilford Press.

Barabasi A-L (2003) *Linked: How Everything Is Connected to Everything Else and What It Means*. New York: Penguin.

Barbrook R and Cameron A (1996) The Californian Ideology, *Science as Culture* 26: 44–72.

Barney D (2000) *Prometheus Wired: The Hope for Democracy in the Age of Network Technology*. Chicago: The University of Chicago Press.

—— (2004) *The Network Society*. Cambridge: Polity.

Barthes R (1982) *Empire of Signs*. New York: Hill and Wang.

Battelle J (2005) *The Search: How Google and Its Rivals Rewrote the Rules of Business and Transformed Our Culture*. New York: Penguin.

Baudrillard J (1981) *For a Critique of the Political Economy of the Sign*. St. Louis: Telos.

—— (1983) *Simulation*. New York: Semiotext(e).

Bauman Z (2000) *Liquid Modernity*. Cambridge: Polity Press.

—— (2001) *The Individualized Society*. Cambridge: Polity Press.

Beck U (2000) *The Brave New World of Work*. Cambridge: Polity.

Bell D (1976) *The Cultural Contradictions of Capitalism*. New York: Basic Books.

—— (1999) *The Coming of Post-Industrial Society: A Venture in Social Forecasting*. New York: Basic Books.

Beniger J (1986) *The Control Revolution: Technological and Economic Origins of the Information Society*. Cambridge, MA: Harvard University Press.

Benkler Y (2006) *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. New Haven, CT: Yale University Press.

Best S and Kellner D (2000) Kevin Kelly's Complexity Theory: The Politics and Ideology of Self-Organizing Systems, *Democracy and Nature* 6(3): 375–400.

Bijker W (1995) *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change*. Cambridge, MA: MIT Press.

Boltanski L and Chiapello È (2005) *The New Spirit of Capitalism*. London: Verso.

Bonabeau E, Dorigo, M and Theraulaz, G (1999) *Swarm Intelligence: From Natural to Artificial Systems*. New York: Oxford University Press.

Borsook P (1996) The Anarchist, *Wired*, April.
—— (2000) *Cyberselfish: A Critical Romp through the Terribly Libertarian Culture of High Tech*. New York: Public Affairs.
Boyer, R, ed, (2002) *Regulation Theory: The State of the Art*. New York: Routledge.
Braverman, H (1974) *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century*. New York: Monthly Review Press.
Bronson P (2003) Boom Space: What's Left After the Thrill is Gone?, *Wired*, June.
Brown J (2004) Time Warp, *Wired*, May.
Browning J and Reiss S (1998) Encyclopedia of the New Economy, *Wired*, March–May.
Buchanan M (2002) *Nexus: Small Worlds and the Groundbreaking Science of Networks*. New York: Norton.
Castells M (1996) *The Rise of the Network Society*. Oxford: Blackwell.
Copland D (1994) Microserfs, *Wired*, January.
Crumlish C (2004) *The Power of Many: How the Living Web Is Transforming Politics, Business, and Everyday Life*, Bloomington, IN: Sybex.
Dean J (2002) *Publicity's Secret: How Technoculture Capitalizes on Democracy*. Ithaca, NY: Cornell University Press.
Dorigo M (2004) The Swarmbots are Coming, *Wired*, February.
Duff A (2000) *Information Society Studies*. London: Routledge.
Dyer-Witheford N (1999) *Cyber-Marx: Cycles and Circuits of Struggle in High-Technology Capitalism*. Chicago: University of Illinois Press.
Feenberg A (1991) *Critical Theory of Technology*. New York: Oxford University Press.
—— (1995) Subversive Rationalization: Technology, Power, and Democracy, in A Feenberg and A Hannay (eds) *Technology and the Politics of Knowledge*. Indianapolis: Indiana University Press.
Fisher E (2007a) From Safety Net to the Internet: The Discourse on Network Production in Post-Fordist Society in Dan Caspi and Tal Azran (eds) *New Media and Innovative Technologies*, Be'er Sheva: Ben-Gurion University Press.
—— (2007b) ''Upgrading'' Market Legitimation: Revisiting Habermas's ''Technology as Ideology'' in Neoliberal Times, *Fast Capitalism* 2(2).
—— (2008) The Classless Workplace: The Digerati and the New Spirit of Technocapitalism, *Working USA: The Journal of Labor and Society* 11(2): 181–98.
Frank T (2000) *One Market Under God: Extreme Capitalism, Market Populism, and the End of Economic Democracy*. New York: Anchor Books.
Fraser N (2003) From Discipline to Flexibilization? Rereading Foucault in the Shadow of Globalization, *Constellations* 10(2): 160–71.
Fraser N and Honneth A (2003) *Redistribution of Recognition? A Political-Philosophical Exchange*. New York: Verso.
Friedman T (2000) *The Lexus and the Olive Tree: Understanding Globalization*. New York: Anchor Books.
—— (2005) *The World is Flat: A Brief History of the Twenty-First Century*. New York: Picador.
Fuchs C (2008) *Internet and Society: Social Theory in the Information Age*. New York: Routledge.
Gates B (2000) *Business @ the Speed of Thought: Succeeding in the Digital Economy*. New York: Business Plus.
Gere C (2002) *Digital Culture*. London: Reaktion Books.

Gilder G (1989) *Microcosm*. New York: Simon and Schuster.
Glenny M (2001) How Europe Can Stop Worrying and Learn to Love the Future, *Wired*, February.
Goetz T (2003) Open Source Everywhere, *Wired*, November.
Gramsci A (1971) Americanism and Fordism, in *Selections from the Prison Notebooks*. New York: International Publishers.
Greenbaum J (1995) *Windows on the Workplace: Computers, Jobs, and the Organization of Office Work in the Late Twentieth Century*. New York: Monthly Review Books.
Habermas J (1970) Technology and Science as "Ideology'', in *Toward a Rational Society; Student Protest, Science, and Politics*. Boston: Beacon Press.
Haraway D (1991) *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge.
—— (1997) *ModestWitness@SecondMillenium.FemaleManMeetsOnco Mouse: Feminism and Technoscience*. New York: Routledge.
Hardt M and Negri A (2001) *Empire*. Cambridge, MA: Harvard University Press.
Harvey D (1990) *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*. Oxford: Blackwell.
—— (2005) *A Brief History of Neoliberalism*. Oxford: Oxford University Press.
Hayles M K (1999) *How We Became Posthuman: Virtual Bodies, Cybernetics, Literature, and Informatics*. Chicago: The University of Chicago Press.
Heffernan N (2000) *Capital, Class, and Technology in Contemporary American Culture: Projecting Post-Fordism*. London: Pluto Press.
Heilemann J (2001) Andy Grove's Rational Exuberance, *Wired*, June.
Herf J (1984) *Reactionary Modernism: Technology, Culture, and Politics in Weimar and the Third Reich*. Cambridge: Cambridge University Press.
Howe J (2006) The Rise of Crowdsourcing, *Wired*, June.
Hughes D (1994) Chaos Is the Form, *Wired*, January.
Huws U (2003) *The Making of a Cybertariat: Virtual Work in Real World*. New York: Monthly Review Press.
Jameson F (1991) *Postmodernism, or The Cultural Logic of Late Capitalism*. London: Verso.
Jessop B (1994) Post-Fordism and the State, in Ash Amin (ed.) *Post-Fordism*. Oxford: Blackwell.
Johnson S (2002) *Emergence: The Connected Lives of Ants, Brains, Cities, and Software*. New York: Touchstone.
Jonscher C (1999) *The Evolution of Wired Life: From the Alphabet to the Soul-Catcher Chip – How Information Technologies Change Our World*. Hoboken: Wiley.
Keen A (2007) *The Cult of the Amateur: How Today's Internet is Killing Our Culture*. New York: Doubleday.
Kelly K (1993) George Gilder: When Bandwidth is Free, *Wired*, September/October,1993.
—— (1995) *Out of Control: The New Biology of Machines, Social Systems and the Economic World*. Reading, MA: Addison-Wesley.
—— (1997) New Rules for the New Economy, *Wired*, September.
—— (1998) *New Rules for the New Economy: 10 Radical Strategies for a Connected World*. New York: Viking.
—— (1999) The Roaring Zeros, *Wired*, September.
—— (2005) We Are the Web, *Wired*, August.

Kessler A (2006) *The End of Medicine: How Silicon Valley (and Naked Mice) Will Reboot Your Doctor*. New York: Collins.

Kline D and Burstein D (2005) *Blog!: How the Newest Media Revolution is Changing Politics, Business, and Culture*. CDS Books.

Koerner B (2006) Geeks in Toyland, *Wired*, February.

Koolhaas R (2003) Office Space: Where do You Want to Work Today?, *Wired*, June.

Kunzru H (1997) You are Cyborg, *Wired*, February.

Kurzweil R (2000) *The Age of Spiritual Machines: When Computers Exceed Human Intelligence*. New York: Viking.

—— (2005) *The Singularity Is Near: When Humans Transcend Biology*. New York: Viking.

Lash S (2002) *Critique of Information*. London: Sage.

Leslie J (1997) Dawn of the Hydrogen Age, *Wired*, October.

Lessig L (2006) *Code: Version 2.0*. New York: Basic Books.

Levy S (2005) The Trend Spotter, *Wired*, October.

Lowe D (1995) *The Body in Late-Capitalist USA*. Durham, NC: Duke University Press.

Luman S (2005) Open Source Softwear, *Wired*. June.

Lyotard J-F (1984) *The Postmodern Condition: A Report on Knowledge*. Minneapolis: University of Minnesota Press.

Mackay H (2003) *Investigating the Information Society*. London: Routledge.

Marcuse H (1964) *One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society*. Boston: Beacon Press.

Mattelart A (2003) *The Information Society: An Introduction*. Thousand Oaks, CA: Sage.

May C (2002) *The Information Society: A Skeptical View*. Cambridge: Polity Press.

Mayr O (1986) *Authority, Liberty, and Automatic Machinery in Early Modern Europe*. Baltimore, MD: Johns Hopkins University Press.

Meyer C (2004) The New Facts of Life, *Wired*, February.

Mitchell W J (2004) *Me++: The Cyborg Self and the Networked City*. Cambridge, MA: MIT Press.

Moravec H (1999) *Robot: Mere Machine to Transcendent Mind*. New York: Oxford University Press.

Mosco V (2004) *The Digital Sublime: Myth, Power, and Cyberspace*. Cambridge, MA: The MIT Press.

Negroponte N (1997) Negroponte, *Wired*, October.

Noble D (1984) *Forces of Production: A Social History of Industrial Automation*. New York: Knopf.

—— (1999) *The Religion of Technology: The Divinity of Man and the Spirit of Invention*. New York: Penguin Books.

Nye D (1994) *American Technological Sublime*. Cambridge, MA: MIT Press.

Offe C (1984) *Contradictions of the Welfare State*. Cambridge, MA: MIT Press.

Oram A (2001) *Peer-to-Peer: Harnessing the Power of Disruptive Technologies*. Cambridge: O'Reilly.

Perseus Publishing, eds, (2002) *We've Got Blog: How Weblogs Are Changing Our Culture*. Cambridge: Perseus Publishing.

Pippin R (1995) On the Notion of Technology as Ideology, in Andrew Feenberg and Alastair Hannay (eds) *Technology and the Politics of Knowledge*. Indianapolis: Indiana University Press.

Piven F F and Cloward R (1997) *The Breaking of the American Social Compact*. New York: The New Press.
Platt C (2000) Steaming Video, *Wired*, November.
Polanyi K (2001) *The Great Transformation: The Political and Economic Origins of Our Time*. Boston: Beacon Press.
Poster M (1990) *The Mode of Information: Poststructuralism and Social Context*. Cambridge: Polity.
Postrel V (1998) Technocracy R.I.P., *Wired*, January.
Rabinbach A (1992) *The Human Motor: Energy, Fatigue, and the Origins of Modernity*. Berkeley: University of California Press.
Ram U (2007) *The Globalization of Israel: McWorld in Tel-Aviv, Jihad in Jerusalem*. New York: Routledge.
Regis E (1994) Meet the Extropians, *Wired*, October.
Reynolds G (2006) *An Army of Davids: How Markets and Technology Empower Ordinary People to Beat Big Media, Big Government, and Other Goliaths*. Nashville, TN: Thomas Nelson.
Rheingold H (2003) *Smart Mobs: The Next Social Revolution*. New York: Basic Books.
Robins K and Webster F (1985) *Information Technology: A Luddite Analysis*. New Jersey: Ablex.
—— (1999) *Times of Technoculture: From the Information Society to the Virtual Life*. London and New York: Routledge.
Schwartz P (1993) Post-capitalist, *Wired*, July/August.
Schwartz P and Kelly K (1996) The Relentless Contrarian, *Wired*, August.
Scoble R and Israel S (2006) *Naked Conversations: How Blogs are Changing the Way Businesses Talk with Customers*. Hoboken: Wiley.
Scott J (1988) Deconstructing Equality-Versus-Difference: Or, the uses of Poststructuralist Theory for Feminism, *Feminist Studies* 14(1): 33–50.
Segal H (1985) *Technological Utopianism in American Culture*. Chicago: The University of Chicago Press.
—— (1994) *Future Imperfect: The Mixed Blessings of Technology in America*. Amherst: The University of Massachusetts Press.
Sennett R (2000) *The Corrosion of Character: The Personal Consequences of Work in the New Capitalism*. New York: Norton.
—— (2006) *The Culture of the New Capitalism*. New Haven, CT: Yale University Press.
Shirky C (2008) *Here Comes Everybody: The Power of Organizing Without Organizations*. New York: Penguin.
Smith M and Marx L (1994) *Does Technology Drive History? The Dilemma of Technological Determinism*. Cambridge, MA: MIT Press.
Stehr N (2001) *The Fragility of Modern Societies: Knowledge and Risk in the Information Age*. Thousand Oaks, CA: Sage.
Sterling B (2005) Order Out of Chaos, *Wired*, April.
Stone B (2004) *Who Let the Blogs Out?: A Hyperconnected Peek at the World of Weblogs*. New York: St. Martin's Press.
Strogatz S (2003) *Sync: The Emerging Science of Spontaneous Order*. New York: Hyperion.
Sturken M and Thomas D (2004) Introduction: Technological Visions and the Rhetoric of the New, in M Sturken, D Thomas, and SJ Bell-Rokeach (eds) *Technological Visions: The Hopes and Fears that Shape New Technologies*. Philadelphia, PA: Temple University Press.

Surowiecki J (2004) *The Wisdom of Crowds: Why the Many are Smarter than the Few and How Collective Wisdom Shapes Business, Economics, Societies and Nations*. New York: Doubleday.
Susstein C (2006) *Infotopia: How Many Minds Produce Knowledge*. New York: Oxford University Press.
Tanz J (2007) Desktop R.I.P., *Wired*, April.
Tapscott D, and Williams A (2008) *Wikinomics: How Mass Collaboration Changes Everything*. New York: Portfolio.
Taylor M C (2003) *The Moment of Complexity: Emerging Network Culture*. Chicago: University of Chicago Press.
Touraine A (1971) *The Post-Industrial Society; Tomorrow's Social History: Classes, Conflict and Culture in the Programmed Society*. New York: Random House.
Turkle S (1997) *Life on the Screen: Identity in the Age of the Internet*. New York: Simon & Schuster.
Turner F (2006) *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism*. Chicago: University of Chicago Press.
Von Hippel E (2006) *Democratizing Innovation*, Cambridge, MA: MIT Press.
Wajcman J (2004) *TechnoFeminism*. Cambridge: Polity.
Webster F (2002) *Theories of the Information Society*. London: Routledge.
Wienberger D (2008) *Everything Is Miscellaneous: The Power of the New Digital Disorder*. New York: Holt.
Williams R and Edge D (1996) The Social Shaping of Technology, *Research Policy* 25: 856–99.
Winner L (1977) *Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought*. Cambridge, MA: MIT Press.
Wriston W (1992) *The Twilight of Sovereignty*. New York: Scribner.
Wolf G (2003) *Wired: A Romance*. New York: Random House.

Bio

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