

Labor in the Global Digital Economy

**LABOR IN THE GLOBAL
DIGITAL ECONOMY**

The Cybertariat Comes of Age

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Contents

Introduction

1. WHAT WILL WE DO?

The Destruction of Occupational Identities in
the Knowledge-Based Economy

2. FIXED, FOOTLOOSE, OR FRACTURED

Work, Identity, and the Spatial Division of Labor in
the Twenty-First-Century City

3. BEGGING AND BRAGGING

The Self and the Commodification of Intellectual Activity

4. THE GLOBALIZATION OF LABOR AND THE ROLE OF NATIONAL GOVERNMENTS

Toward a Conceptual Framework

5. EXPRESSION AND EXPROPRIATION

The Dialectics of Autonomy and Control in Creative Labor

6. CRISIS AS CAPITALIST OPPORTUNITY

The New Accumulation through Public Service Commodification

7. THE UNDERPINNINGS OF CLASS IN THE DIGITAL AGE

Living, Labor, and Value

7. The Underpinnings of Class in the Digital Age

Living, Labor, and Value

As Marxism has segued in and out of vogue, there is hardly a Marxian concept that has not at some time been questioned as anachronistic in the light of the transformations in economic and political conditions that have occurred over the last century and a half. The current renewal of interest in Marx's ideas is no exception. It is indeed no easy task to apply theoretical concepts developed in the mid-nineteenth century to a world where capitalism has penetrated every region and every aspect of life, where the pace of technological change is so rapid that labor processes are obsolescent within months of being introduced, and where the division of labor is so intricate that no single worker has any chance of grasping it in its full complexity. Divisions between manual and non-manual work dissolve and are reconstituted, the boundaries between production, distribution, and consumption melt away, and, though some paid work morphs into unpaid work, new jobs and new economic activities are generated from areas of life that were traditionally seen as beyond the scope of any market. In the suck and blow of commodification, the abstract becomes concrete and the concrete abstract, casting doubt on conceptual categories that formerly seemed self-evident. It may seem that we need new definitions of the most basic concepts used by Karl Marx, including "class," "commodity," and "labor."

One current idea that has attracted considerable support, especially among the young, is the notion that the idea of a working class defined by its direct relationship to production is outmoded. Since all aspects of life, such arguments go, have been drawn into the scope of the capitalist cash nexus in

some way, all those who are not actually part of the capitalist class must be regarded as part of an undifferentiated “multitude.” In Michael Hardt and Antonio Negri’s formulation, this multitude takes the place of a working class, and according to Guy Standing, a “precariat” constitutes a new class in and for itself alongside the traditional proletariat.¹ Standing does not attempt to locate this precariat with any precision in relation to capitalist production processes. However, many of the followers of Hardt and Negri have engaged in elaborate attempts to do so in relation to the multitude. Two questions in particular have puzzled them: What sorts of commodities are being produced by members of this multitude?² And how does the value produced by this labor accrue to capital?

In these debates particular attention has been paid to the value created online by “virtual” or “digital” labor. In the field that is becoming known as Internet studies, there have recently been energetic debates about digital labor and how it should be conceptualized.³ These debates have addressed the increasingly blurred boundaries between “work” and “play,” encapsulated in the term “playbour,”⁴ and between production and consumption—“prosumption”⁵ and “co-creation”⁶—discussed the problematic category of “free labor,”⁷ and questioned whether such labor, paid or unpaid, can be regarded as producing surplus value and whether it is “exploitative” or “alienated.” With the exception of Andrew Ross, few of these authors have drawn parallels with other forms of labor carried out offline. Yet many of the questions they raise apply much more generally to labor under capitalism. These debates thus provide a useful starting point for investigating the labor theory of value itself, and how—or, some would wonder, even if—it can be applied in twenty-first-century conditions.

This essay argues that it is still possible to apply Marx’s theory in current conditions, to define what is, or is not, a commodity, to identify the point of production of such commodities, whether material or immaterial, and to define the global working class in relation to these production processes. In order to do so, it is necessary to reexamine the labor theory of value in all its dimensions. I pay particular attention to “digital” or “virtual” labor not only because it is currently attracting so much attention, but also because online labor is particularly difficult to conceptualize. It is thus a fertile source of cases against which to test more general hypotheses. If a theory can apply here, then it should be more generally applicable. The aim of doing this is to enable a mapping of the working class across the whole economy by

applying the theory more broadly (as Marx did). This is an important task, in my view, because without a clear sense of which workers are engaged directly in the antagonistic relation to capital that characterizes commodity production, and without identifying where that point of production is located, it is impossible to identify strategies that will enable labor to confront capital where it is possible to exercise some power to shape the future in its own interests.

LABOR AND CAPITALISM

The labor theory of value is the knot at the heart of Marx's conceptualization of capitalism as a social relationship. It integrally links three things: workers' need for subsistence, their labor, and the surplus value expropriated from the results of that labor, without which capital cannot be accumulated or capitalism perpetuated. The expropriation of labor is the act of violence at the heart of this relationship. It is the worker's labor time that constitutes the bone that is fought over when a worker is employed, so an understanding of how and under what circumstances this expropriation takes place is critical to an understanding both of capitalism as a system and of which workers can be said to belong to the working class. The knot cannot be undone: each rope is essential to holding the system together. Nevertheless, it seems necessary to examine it, strand by strand, so that we can grasp how it is put together, what tightens it, and what enables new threads to be drawn in or existing ones more elaborately entangled.

In its basic form, the argument is remarkably simple: the worker, obliged to do so in order to subsist, works a given number of hours for the capitalist, producing a certain value as a result. Some of this value is essential to cover the cost of subsistence, and the hours worked to produce this value, "necessary labor time," are (usually) reimbursed. The remainder, "surplus value," is appropriated by the capitalist to distribute as profit and invest in new means of production. On close examination, however, just about every element of this simple story turns out to be open to question. What, exactly, is "labor"? And, more particularly, what labor is productive of surplus value? How is "subsistence" to be defined? Does it include only what the individual worker needs to survive, or does it also include what is required for the sustenance of his or her entire household? If we cannot define

subsistence precisely, how can we possibly calculate necessary labor time? And, just because all value within capitalism ultimately derives from the results of human labor applied to the earth's raw materials, does this mean that all value that accrues to individual capitalists is necessarily surplus value?

The current debates around “digital labor” skim past some of these questions and oversimplify others. This essay will not attempt to rewrite Marx's entire theory. Rather, it will take some of the questions raised in these debates about digital labor as starting points for examining the factors that will have to be taken into account in any modern elaboration of Marx's theory, an elaboration that will, in my view, be an essential precondition for understanding the new class formations that are emerging in the twenty-first century in all their complex and contradictory dimensions. I will do this by attempting to unravel the three strands—*living* (or subsistence), *labor*, and *value*—in order to categorize their separate components. I will do this in reverse order, reflecting the priorities of current debates in this field, looking first at value, then at labor, and finally at subsistence. These concepts are all well used and difficult to reemploy without bringing along a large freight of associated meanings, both intended and unintended. So it is perhaps useful to begin with two explanatory notes.

The first concerns terminology. In advanced capitalist societies, not only is the division of labor extremely complex but so, too, is the distribution of wealth. Workers' subsistence is achieved not only as a direct result of waged labor but also via redistribution through the financial system (in the form of credit, private insurance, and pension schemes, etc.) and through the state (in a monetary form through tax and Social Security systems, and in kind by means of state-provided services). In such a context, the direct connection between labor and value can be obscured. It is common for analysts to follow Marx in classifying labor as “productive” or “unproductive” (of surplus value). The approach I adopt in this essay draws on insights from feminism and makes a slightly different distinction. This is a distinction between labor that is productive for capitalism as a whole, which can be termed “reproductive,” and labor that is directly productive for individual capitalists, which, for lack of a better term, I have named “directly productive.” I draw a further distinction between work that is paid and work that is unpaid.

A typology of labor based on the intersection of these two variables (reproductive/productive and paid/unpaid) is summarized in the table on [page 155](#).

Dependent though it is on other forms of labor for its reproduction, the quintessential form of labor that characterizes capitalism is labor that *both* produces value for capitalist enterprises *and* produces the income necessary for the worker's survival. This is work whose very performance contains within itself the contestation of labor time between worker and capitalist and at whose heart lies the wrench of expropriation, the experience of which Marx described as "alienation" (a term that has, unfortunately, become so contaminated with other meanings that it can no longer be used with the precision with which Marx employed it). And this is therefore the work that lies at the core of the accumulation process. The workplace is not, of course, the only place that labor confronts capital. But because capital cannot be accumulated without workers' consent, it is the site at which labor has the greatest potential power to wrest concessions from capital (without resorting to bloodshed).

The term "waged labor" encompasses work that Marx would have designated as both productive and unproductive. It also excludes various forms of labor (piecework, freelance work, etc.) paid in non-wage forms, which contribute directly both to capital accumulation and workers' subsistence. Defining labor only in terms of whether or not it is productive, in Marx's sense, ignores the reality that (as will be discussed below) there is a considerable amount of unpaid labor that produces value directly for capital without contributing to the worker's subsistence. Conversely, there is paid labor that contributes to subsistence without creating value directly for capital. After spending some time considering a range of alternatives—including "contested productive labor," "alienated productive labor," "directly productive labor," and "productive waged labor"—I have, for the purposes of this essay, decided to use a shorthand term to distinguish it from other forms of productive and waged labor. Drawing on the metaphor I used to describe the labor theory of value, I refer to it in this essay as labor which is "inside the knot." This is the labor classified in Quadrant C in the table.

Labor "inside the knot" in this definition is labor carried out directly for a capitalist employer by a worker who is dependent on this labor for subsistence and is therefore a front-line adversary in the struggle between capital and labor over how much labor time should be exchanged for how

much money. This may seem like a somewhat narrow definition. It is indeed the sort of definition that was much criticized in the 1960s and 1970s for excluding large groups of workers who often saw themselves as part of the working class, including public sector workers and some service workers, whose relationship to production was indirect (workers who belong in Quadrant A in this diagram). In using it here, I am not arguing that such workers are not unproductive. On the contrary, many of the tasks they perform are essential for the reproduction of labor. However, these workers' exposure to the coercive logic of capitalism may be somewhat mitigated, either because they are working under older forms of employment (for instance as domestic servants, independent artisans or other petty commodity producers) or because they are employed by the state to provide as yet uncommodified services.

	<i>Paid labor</i>	<i>Unpaid labor</i>
<i>Reproductive: productive for society/ capitalism in general</i>	A Public administration and public service work (including NGOs); individually provided private services.	B Domestic labor: childcare, household maintenance, etc., including non-market cultural activities
<i>Directly productive: for individual capitalist enterprises</i>	C Commodity production, including distribution	D Consumption work – substituting the unpaid labor of consumers for that of paid service and distribution workers.

Labor: A Schematic Typology

These forms of labor still exist, of course, but, as I argued in [chapter 6](#), in the current wave of commodification these forms of work are diminishing and the workers who carried them out are rapidly being drawn “inside the knot.”⁸ In other words, the commodification of public services has produced a major shift of labor from Quadrant A to Quadrant C in the diagram.

This is not the only movement that is occurring.⁹ The more general commodification of consumer goods and services has also involved large

shifts from Quadrant B to Quadrant D, transforming the nature of unpaid work from the direct production of use values for household members to the purchasing of commodities in the market, involving a direct relationship with capitalist production and distribution activities.

In a further twist, there has also been a shift of labor from Quadrant C to Quadrant D as capitalist production and distribution companies have reduced their labor costs, increasing the exploitation of their paid workers by externalizing more and more tasks onto consumers who have to carry them out as unpaid self-service activities.

In a parallel process, austerity measures are also leading to a shift of activities from Quadrant A to Quadrant B, which in turn puts more pressure on the further shift from B to C.

Thus while labor “inside the knot” constitutes a subset of all labor, it is a subset that is rapidly expanding to become the overwhelming majority of paid labor.

My second cautionary note concerns the danger of extrapolation from a typology of labor to a typology of workers and hence to a class typology. Though part of my aim is to classify different forms of labor in their relation both to capital accumulation and workers’ subsistence, I do not intend in so doing to produce a classification of *workers* that can be read off in any simple manner from this typology. Most workers engage in several different kinds of labor, paid and unpaid, both simultaneously and over the course of their lives, crossing these simple categories. Even more important, most workers live in households where different kinds of labor are carried out by different household members, some of whom, at any given time, may be unemployed. Whether or not members of such households perceive themselves, or can be perceived by others, as belonging to the working class is a large question. In my conclusion I will attempt to sketch out some of the ways it might be possible to map working classes in the twenty-first century drawing on this analysis. But the analysis of labor constitutes only a small first step in that larger process, and this exercise is necessarily speculative.

“DIGITAL LABOR” AND MATERIAL ECONOMIES

Before embarking on this analysis, it is worth noting that digital labor cannot be regarded as a discrete form of labor, separated hermetically from the rest of the economy. As I have argued in the past, the existence of a separately visible sphere of non-manual labor is not evidence of a new “knowledge-based,” “immaterial,” or “weightless” realm of economic activity.¹⁰ It is simply an expression of the growing complexity of the division of labor, with a fragmentation of activities into separate tasks, both “mental” and “manual,” increasingly capable of being dispersed geographically and contractually to different workers who may be barely aware of one another’s existence. This is a continuing process, with each task subject to further divisions between more creative and/or controlling functions on the one hand, and more routine, repetitive ones on the other.

Furthermore, though there has clearly been an enormous expansion in non-manual work, both routine and de-skilled and otherwise, it remains a minority of all labor. The growing visibility of apparently dematerialized labor, dependent on information and communications technologies, has sometimes served to obscure the reality that this “virtual” activity is dependent on a highly material basis of physical infrastructure and manufactured commodities, most of which are produced out of the sight of observers in developed economies, in the mines of Africa and Latin America, the sweatshops of China, and other places in the developing world. Without the generation of power, cables, satellites, computers, switches, mobile phones, and thousands of other material products, the extraction of the raw materials that make up these commodities, the launching of satellites into space to carry their signals, the construction of the buildings in which they are designed and assembled and from which they are marketed, and the manufacture and operation of the vehicles in which they are distributed, the Internet could not be accessed by anyone.

Although 20 percent of the world’s 100 largest transnational corporations are now service companies, it should not be forgotten that 80 percent are not.¹¹ And, according to UNCTAD, in 2012 it was manufacturing companies that were expanding their foreign investment the fastest.¹² The physical production of material commodities is still capitalism’s preferred method for generating profit; it is still growing, and it seems likely to continue to employ the largest proportion of the world’s workforce.

There is, moreover, a continuum between tasks that mainly involve the exercise of physical strength or dexterity and those that involve mental

agility, engagement, or concentration. Few jobs do not require workers to bring their own knowledge, judgment, and intelligence to the task at hand, and even fewer do not involve some physical activity, even if this just entails speaking, listening, watching a screen, or tapping keys.

That said, a large and growing proportion of the workforce *is* involved in performing “digital labor” whose products are intangible, much of it low-paid and menial. And many members of this workforce are descended from or cohabiting with workers who would by any definition be assigned to the working class. It is therefore important to understand what role their labor plays in global capitalism, what the composition of this workforce is, how it is changing, and what class allegiances these workers might express.

VALUE

Put simply, it could be said that there are three main ways that enterprises generate profit under capitalism, the first two of which also existed under other systems. These are rent, trade, and the generation of surplus value through commodity production. Because it is the paradigmatic form of value generation under capitalism, it is commodity production that receives the most attention from Marxian analysts. If value is observably being generated from some activity, the tendency is to search for the commodity at its source. If a commodity cannot easily be identified, or if it does not appear to be produced by extracting surplus value from paid workers, then it is sometimes concluded that this means Marx’s labor theory of value does not apply and is either outmoded or in need of adaptation. However, before leaping to the conclusion that entirely new theories are needed to explain new activities that do not seem to fit the earlier models, such as online activities, it is worth analyzing them in relation to traditional forms of value generation to see whether they fit these categories.

RENT

The ways in which commercially mediated online activities seem to encroach indiscriminately on work, leisure, consumption, and personal relationships draws attention to the extent to which capitalist relations have

spread into all aspects of life, or as Marx put it, “In the modern world, personal relations flow purely out of relations of production and exchange,” encouraging broad-ranging speculation about how the monetization of online exchanges can be understood and theorized.¹³ The starting point for many of the current discussions about the value generated on the Internet is the indisputable reality that online companies like Google and Facebook are hugely profitable. If they are making profits, it is then argued, this must be because some commodity is being produced, which in turn begs the question what precisely these commodities might be and whose labor is producing them. In the case of Google and Facebook, the main source of income is revenues from advertising, which can be targeted with great precision as a result of the ever-more sophisticated analysis of data generated by users. Here, Dallas Smythe’s concept of the “audience commodity”¹⁴ has been seized on by a number of commentators, including Christian Fuchs.¹⁵ Originally developed as part of a Marxian attempt to understand the economics of advertising in commercial radio and television, this concept portrays the media audience as the commodity that is sold to advertisers to generate revenue: “Because audience power is produced, sold, purchased and consumed, it commands a price and is a commodity.”¹⁶ Fuchs applies this logic to the Internet: “The productive labor time that is exploited by capital . . . involves . . . all of the time that is spent online by the users.” He goes on to say that “the rate of exploitation converges towards infinity if workers are unpaid. They are infinitely exploited.” Other contributors to the digital labor debate suggest that “reputation”¹⁷ or even life itself, produced by “biolabor,”¹⁸ have become commodities.

While Smythe’s concept has undoubtedly opened up useful insights into the nature of the mass media, it has also led to much confusion. The underlying assumption among Smythe’s followers seems to be that the term “commodity” can be used to refer to anything that can be bought and sold. There is a certain circular logic operating here. Since Marx declares that “commodities are nothing but crystallized labor” and that “a good only has a value because labor is objectified or materialized in it,” then it must follow, according to this logic, that anything described as a commodity must be the result of productive labor.¹⁹ But how useful is such a broad conception of the term?

It seems to me that in order to understand the distinctive nature of the commodity form under capitalism a somewhat different definition needs to

be used. I have defined commodities elsewhere as “standardized products or services for sale in a market whose sale will generate profits that increase in proportion to the scale of production” (all else being equal).²⁰ This definition singles out capitalist commodities as fundamentally different from those produced under other systems. A traditional carpenter making chairs and selling them directly to the public makes more or less the same profit on each chair. The capitalist who opens a factory and employs workers to mass-produce chairs has to make an investment in machinery, buildings, and so on and will not make a profit on the first chair, but the more chairs that are produced in that factory, the greater the profit on any given one. This gives the chairs produced in the factory a fundamentally different character from those produced individually by a single artisan in relation to their value. There are a number of services, including intangible ones (such as insurance policies or software programs), that have the same character as commodities. It is the social relations under which they are produced—the coerced labor of waged workers, under the control of the capitalist—that gives them this character.²¹ Such a definition of commodity inverts the logic of Smythe’s followers. It takes as its starting point the nature of the capitalist-labor relationship rather than the fact that something is being sold.

If they do not derive from the sale of commodities, how can we understand the profits made by online social networking or search engine companies? An alternative explanation, and one that has long antecedents in the offline world, is that they derive from rent. A simple historical example of a similar way of generating income could be provided by a street market where the rent charged for a stall-space is higher in areas where the most customers (or the richest customers) will pass by. Bricks-and-mortar examples can be found on New York’s Fifth Avenue, London’s Oxford Street, or any other street with a large and lucrative footfall: the more well-trafficked the site, the higher the rent. For well over a century, properties that border busy highways have been able to make money by renting space for billboards. Don’t online companies simply follow the same model albeit with sites that are virtual rather than paved, and rather more sophisticated means of identifying the most lucrative customers and gaining intelligence about their desires? The value that accrues to the social networking and search engine sites does indeed ultimately derive from surplus value produced by labor. But this is the labor of the workers who produced the

commodities that are advertised on these sites, not the labor of the people who use the sites.²²

Some participants in the digital labor debate, such as Adam Arvidsson and Eleanor Colleoni, dispute Fuchs's notion that social media users are producing surplus value.²³ They, too, argue that the value generated can be more properly regarded as rent. However, they use the term "rent" to refer to the value that accrues to financial investors in these companies. But in this respect they do not say what it is that makes online companies different from any other companies that are quoted on stock exchanges and attract financial investments. In attempting to classify what, precisely, it is that generates the value that attracts such investors, they develop an explanation whereby "social media platforms like Facebook function as channels by means of which affective investments on the part of the multitude can be translated into objectified forms of abstract affect that support financial valuations." They further argue that such companies gain their share of "socially produced surplus value" through "the ability to attract affective investments . . . from the multitude or the global public."²⁴ This somewhat convoluted model sidesteps the rather more prosaic question of who is paying whom for what in order to generate the return on investment for the shareholders. It can, in my opinion, be rather simply answered by saying that it is the advertisers (producers of commodities for sale) who are paying the social media or search engine companies for the opportunity to advertise to their users. This is not to deny that social media sites do not incidentally also facilitate other forms of labor that could be regarded as more directly productive. These will be discussed below.

There are, of course, a number of ways that value is generated online other than through the use of search engine or social media sites. Many other online activities rely on rent for the generation of income. These include a variety of other sites that rely on advertising revenue, but also sites that charge rents to their users for access to information (such as online databases), sites from which copyright music or videos can be purchased and downloaded (such as iTunes), companies that sell software licenses online, and online games for which subscriptions have to be bought (on the same principle as software licenses).

Other sites can be regarded as essentially online equivalents of offline businesses that generate income from rent. These include online marketplaces (such as eBay), dating sites (such as eHarmony or Match.com),

online employment agencies that match freelance workers to employers (such as oDesk or Elance), price comparison sites, online travel booking or accommodation finding sites (such as Expedia), or various forms of peer-to-peer services allowing people to find bed-and-breakfast accommodation (such as Airbnb) or car shares (such as Lyft). The connection with offline businesses is often evident here. For example, one of the largest of the online peer-to-peer car rental services, RelayRides, was launched with funding from GM Ventures (the investment arm of General Motors) in 2011 and has now been acquired by Zipcar, which in turn was acquired by Avis in January 2013.²⁵

Whatever the specific mix of sources of revenue, most of the profit of such enterprises comes from some combination of charging usage or commission fees to service providers and/or service users and/or advertisers—in other words, rent. It is interesting to note that some of these sites seem to be enabling the development of new forms of petty commodity production and rentier activity or allowing older forms to survive offline. Etsy, for example, makes it possible for individuals to sell craft products in the online equivalent of a crafts market. Airbnb lets them make an income from renting out rooms in their homes for bed and breakfast (taking a percentage of the cost). Peer-to-peer car rental services enable people to provide taxi services or charge others to borrow their cars.

TRADE

Trade involves acquiring something at one price (including stealing it) and selling it a higher price, making a profit in the process. Some forms of stealing, such as the appropriation of other people's intellectual property, may take place online. These include the reselling of captured images or music or the plagiarism of text for sale or some more elaborate forms of theft that are currently emerging, such as the exploitation of the unpaid labor of language learners to obtain free translation of Web content by the website Duolingo.com, or reCAPTCHA's use of users' attempts to decode distorted images of letters and numbers—that cannot be recognized by automatic optical scanning systems.²⁶

However, there are also a very large number of companies that sell online (Amazon being probably the most famous) in a manner that replicates

offline commercial trade. Indeed many established merchants now buy and sell both online and offline. Although there may be some blurring of traditional boundaries among the distribution activities of manufacturers, wholesalers, and retailers, and some labor processes may be rather different, there is nothing mysterious about how value is generated here. The scale of many of these companies, and the fact that they have had to put extensive infrastructure in place for processing payments internationally, has meant that some of them have been able to diversify into rental activities that have in turn created the basis for new forms of commodity production, discussed in the next section.

COMMODITY PRODUCTION

This brings us to the final category: value generated from the production of commodities. Here, the analyst seeking to isolate the role of digital labor in value creation is faced with considerable challenges. The spread of computing across most sectors of the economy, combined with the near-universal use of telecommunications, means that few economic activities do *not* involve some element of digital labor, whether they take place in farms, factories, warehouses, offices, shops, homes, or in moving vehicles. Furthermore, these activities are linked with one another in complex chains that cross the boundaries of firms, sectors, regions, and countries. Tracing the connection of any given activity back to its origins, or forward to the final commodity to whose production it has contributed, is no easy task. Nevertheless, it is by no means impossible. One useful approach here is to analyze economic activities in functional terms.²⁷

The functions of research and development and design, for instance, clearly make direct inputs to the development of new commodities (or the adaptation of older ones). Much of the labor involved in these activities nowadays comes into the category of digital labor in that it involves computer-based tools and/or is delivered in digital form to the workers who will take it forward to the production stage. The same goes for activities whose purpose is to develop content for books, films, CDs, or other cultural products. Here some activities may be more directly “digital” than others: actors or musicians, for instance, may be performing in a manner that is “live,” but if the end result is going to be incorporated into a reproducible

commodity then their functional relation to capital is the same as that of fellow workers sitting at screens or mixing desks.²⁸ Digital labor is also implicated in a variety of ways in production processes, whether this entails the operation of digitally controlled tools, the maintenance of software, the generation of immaterial products or the supervision of other workers engaged in these processes.

When it comes to “service” activities it is useful—though increasingly difficult—to make a general distinction among those that contribute directly to production (such as cleaning the factory floor or servicing the machines); those that contribute to the maintenance or management of the workforce (such as processing payroll data or staff recruitment or training); those that contribute to the more general management of the enterprise (including financial management); those that are involved in activities connected with purchasing, sales, and marketing; and those that are involved in distribution. All of these categories include activities that are carried out online and/or using a combination of information and communications technologies. They are, however, becoming more and more difficult to tell apart, for several interconnected reasons.

The first of these is the increasingly generic nature of many labor processes. Workers inputting numerical data on a keyboard, for instance, may be doing it for a bank, a government department, or a manufacturing company, for purposes entirely unknown to them. Call center operators may be using standard scripts to deal with sales, customer services, debt collection, government inquiries, fundraising, or a variety of other functions, cutting across any neat classification system that would allow them to be sorted into different categories by function. Software engineers may be working on the development of new products, or the maintenance of existing ones.

Closely linked with this form of standardization is the growing propensity of such activities to be outsourced, often to companies that bundle together a number of different functions for different clients into clusters of activities carried out in shared service centers. The possibility for these and other services to be carried out online has further blurred the distinction between services provided to businesses and those provided directly to final customers. If everyone can order goods online, to be delivered to the door from a central warehouse, then the distinction between “wholesale” and “retail” becomes an artificial one. Similarly, a growing

range of standardized immaterial products, ranging from software licenses to bank accounts to insurance policies, can be sold as readily to individuals as to companies.

The existence of online platforms through which labor can be coordinated has led to the development of an extreme form of subdivision of tasks, sometimes known as “micro-labor,” “crowd work,”²⁹ or “crowd-sourcing.”³⁰ These new forms of labor include “pay-per-click” work whereby workers are paid by commercial companies to “Like” their Facebook posts or blog entries, or platforms like Amazon’s Mechanical Turk, whose users are paid a few cents to perform a variety of very small tasks, so fragmented that workers are very unlikely to understand what relation any given task has to the final commodity to which it contributes.

If such activities, however dispersed, are carried out by paid workers, in the employ of enterprises set up to make a profit, then they can unproblematically be assigned to the category of work that directly produces surplus value for capital—labor “inside the knot.” However, as the borderlines between production, distribution, and consumption become increasingly fuzzy and the same activity can be carried out interchangeably by paid and unpaid workers, this simple position needs some modification. Marx was somewhat ambivalent about distribution labor, regarding transport workers as productive, but not retail workers. However, at one point in the *Grundrisse* he asserted that the whole process of bringing a product to market should be regarded as productive labor: “Economically considered, the spatial condition, the bringing of the product to the market, belongs to the production process itself. The product is really finished only when it is on the market.”³¹ Some would disagree, but I believe that if Marx were alive today and saw the complexity of the distribution processes of modern capitalist enterprises he would assert this point more strongly.

Following this logic, a wide range of functions to be found in a modern corporation can be assigned to this directly productive category, including marketing, logistics management, distribution, transport, customer service, retail and wholesale sales (whether online or offline), and delivery—in short, the whole supply chain from factory gate (or software development site) to the final consumer should be regarded as productive labor. But what happens when the customer’s unpaid labor is substituted for that of the productive waged worker? What if, for instance, you go and fetch a purchase in person from the store or warehouse? Or design your own product, selecting a

unique combination of standard features from a website? And what, exactly, is the difference between booking your own holiday via a website, keying in your own data, and doing so over the phone to a (paid) call-center operator who keys it in on your behalf? In the latter case, the labor falls comfortably into what is traditionally regarded as the “productive” category. But what about the former? In my view, all these activities should be regarded as productive. However, only those carried out by paid workers fall “inside the knot” whereby their relationship to capital is both direct and, actually or potentially, contested.

LABOR

Any attempt to categorize different forms of labor has to begin by confronting the extraordinarily difficult question of what labor actually is. The word itself covers a vast spectrum of meanings from the physical exertion of giving birth at one extreme to formal participation in employment, or the political representation of people who do so, at the other. If we take it to refer to activities that are actually or potentially reimbursed by wages in a “labor market,” then we have to include a large range of activities that most people carry out without pay, including sex, caring for children, cooking, cleaning, gardening, singing, making people laugh, and holding forth on topics that interest us.

If we apply a more subjective filter and try to exclude activities that are carried out for pleasure, then we are confronted with the awkward reality that the same activity may be experienced as a chore or a joy under differing circumstances and, furthermore, that some activities, paid or unpaid, may be both onerous and enjoyable simultaneously. The baby, for instance, may give you a beaming smile while its smelly diaper is being changed; a truck driver’s long lonely journey may suddenly bestow a heart-stoppingly beautiful glimpse of landscape; hard physical work in harsh surroundings may engender a camaraderie among workers that leaves a warm glow long after the muscle ache has subsided; solving a tricky problem may release a sudden gush of satisfaction, even if the problem is not one’s own.

Another dimension that might help to distinguish between “labor” and “pleasure” is whether the activity is carried out voluntarily or by coercion, under the direction of another person or organization. Here again what seems

a simple distinction becomes remarkably difficult to apply in practice. One difficulty results from the historically determined ways in which such things as gender roles, concepts of duty, or even caste-based divisions of labor are internalized, rendering patterns of power and coercion invisible to all parties and, indeed, giving many acts of service the subjective quality of freely offered gifts of love even when objective analysis might suggest that they involve the exploitation of one person's labor by another. Coercion may also be exercised in more indirect ways. An addicted gambler, for instance, may perceive his or her compulsion as internally generated, not recognizing the societal pressures that impel it. The same could, perhaps, be said of many of the online activities that people spend so much time on, including online gaming and interacting with others on social media sites. It is perhaps some inkling of these social pressures that leads so many commentators in the digital media debates to insist that these unpaid activities are a form of "free" labor.³²

Unpaid labor is not, of course, a new phenomenon. It has, however, received only rather fitful attention from Marxian scholars except as a kind of vestigial repository of precapitalist social relations from which waged labor later emerged. Apart from debates about slavery among historians, most of the attention paid to unpaid labor until recently was in the context of what could loosely be called "reproductive labor," in particular in feminist debates during the 1970s. In these discussions, the main question raised was whether unpaid domestic labor or "housework" could be regarded as producing surplus value—because without it capitalism could not exist. The reproduction of the workforce depended crucially, it was argued, on unpaid labor in the home, not only for bringing up the next generation of workers but also to provide the nutrition, cleaning, and bodily maintenance services that allow the current workforce to perform effectively in the labor market. In 1976, Batya Weinbaum and Amy Bridges published a groundbreaking article in which they argued that, under monopoly capital conditions, much of this labor not only involved producing services in the home but also consuming commodities produced in the market.³³ The concept of "consumption work," in which unpaid labor is substituted for what was formerly the paid labor of distribution workers, is one that I developed further in the late 1970s and, I argue here, is relevant for understanding some of the new forms of unpaid labor that take place both on and offline.³⁴ Drawing on some of this work, I propose here a somewhat rough-and-ready

typology of unpaid labor in the hope that it can provide a starting point for a categorization that will bring some clarity to these debates.

The first category is the labor that is carried out independently of the market to produce use values in the home, the category of labor located in Quadrant B in the table on [page 155](#). It is “unproductive” in the sense that it produces no direct value for capital in the form of surplus value from somebody’s direct labor, but is “reproductive” in the sense that it is necessary for the reproduction of the workforce. It includes many of the tasks traditionally carried out in subsistence agriculture and housework. If someone is employed to do this kind of work by the direct user of the service (for example, a domestic servant, nanny, cleaner or gardener) that worker is, in Marx’s opinion, an unproductive worker, although if they are employed via a capitalist intermediary (for example, a commercial childcare, cleaning or gardening company) then they move into the category of productive worker (in terms of the table, from Quadrant A to Quadrant C).³⁵ However, we are concerned here with unpaid labor. To the extent that maintaining the emotional health of a family and sustaining the social networks in which it is embedded is a necessary part of ensuring the survival of a household, then a range of non-physical activities can be included in this category, including such seemingly trivial tasks as remembering birthdays, writing letters of condolence, or arranging social get-togethers that help to produce and reproduce the solidaristic bonds that may be necessary for survival in times of crisis. It also includes acquiring the skills and habits that enable someone to be employable. Even courtship can be regarded as a necessary prelude to this family maintenance project. Many of these activities are carried out online these days; thus at least a part of online social networking activity could be assigned to this category (represented by Quadrant B). Whether or not the person carrying out this labor is exposed to advertising in the process of carrying it out is as incidental to the productivity of the labor as whether or not they might pass a billboard on the way to visit a sick grandmother or be exposed to film commercials while on a date.

The second category of unpaid labor is what I have referred to above as “consumption work” (Quadrant D). This involves the consumer taking on tasks in the market that were previously carried out by paid workers as part of the distribution processes of commodity production. Since these tasks are necessary to the distribution of these commodities, and increase the profits of the commodity-producing companies by eliminating forms of labor that

were formerly paid for, there are strong arguments for categorizing this kind of work as “productive,” even when it is unpaid. However, because it does not generate income directly for the worker it has to be treated differently from paid labor in relation to its contribution to subsistence, a topic to which I will return below. It is, in other words, “outside the knot.” As already noted, increasing amounts of consumption work are now carried out online, with the Internet having opened up a range of new ways of externalizing labor over distance.³⁶

The third category involves creative work. Here Marx made his position clear:

Milton, for example . . . was an unproductive worker. In contrast to this, the writer who delivers hackwork for his publisher is a productive worker. Milton produced *Paradise Lost* in the way that a silkworm produces silk, as the expression of *his own* nature. Later on he sold the product for £5 and to that extent became a dealer in a commodity. . . . A singer who sings like a bird is an unproductive worker. If she sells her singing for money, she is to that extent a wage labourer or a commodity dealer. But the same singer, when engaged by an entrepreneur who has her sing in order to make money, is a productive worker, for she directly *produces* capital.³⁷

According to this conception, to the extent that it is carried out for the purposes of self-expression, unpaid artistic work, such as blogging or posting one’s photographs, music, or videos on the Internet, comes straightforwardly into Marx’s category of “unproductive” labor (which I would prefer to regard as unpaid reproductive labor, producing social use values). If the product of this labor is subsequently sold, or stolen, to become the basis of a commodity, then this does not change that status. It is only if the worker is hired to do the work by a capitalist for a wage that it becomes productive labor in Marx’s sense of the term (i.e., it moves from Quadrant B to Quadrant C). As Andrew Ross has pointed out, many artistic workers may oscillate between these forms: “Creatives have been facing this kind of choice since the eighteenth century when the onset of commercial culture markets offered them the choice of eking out a living with the scribblers on Pope’s Grub Street or of building a name-recognition relationship with the fickle public.”³⁸ The fact that the same person does both kinds of work does not, however, invalidate the distinction between them. Creative work thus has to be seen as straddling a number of different positions in the labor market, including self-employment, paid employment, and petty commodity

production, leading, very often, to contradictory identities for creative workers.³⁹

The same logic applies even in the much-discussed case of the “free labor” that built the Internet, much of which was designed by idealistic software developers who donated their labor for nothing in the belief that they were creating a common benefit for humankind—in other words they were producing social use value without pay, placing them in Quadrant B. As Marx said, “Labor with the same content can be both productive and unproductive.”⁴⁰ In this case, it seems that although the results of their labor were appropriated by capital to incorporate into new commodities, their original unpaid labor cannot be regarded as productive in the sense of producing surplus value for capital under coercive conditions; that is, it is not “inside the knot.” Rather, the value that was produced from it should more properly be put into the category of trade, which, as I noted above, also includes theft.

A fourth—but overlapping—form of unpaid labor, which is increasingly discussed, is the widespread use of unpaid internship or “voluntary” labor.⁴¹ This, too, seems to have precedents in various forms of apprenticeship labor, such as the production of “showpieces” to impress potential employers. Situated ambiguously between education and self-promotion, it is undoubtedly used in highly exploitative ways by employers as a direct substitute for paid work. Sometimes, direct coercion is involved to oblige the worker to undertake unpaid “work placements,” for instance by state job search agencies, which threaten the withdrawal of unemployment benefits from those who refuse to take them. Nevertheless, like the unpaid consumption labor already discussed, while clearly contributing value to commodity production, this form of labor plays no part in generating present income for the worker and must therefore be regarded as “outside the knot,” even if it is producing value indirectly for the unpaid worker in the form of “employability.” It is clear that in order to make sense of the relationship of unpaid labor to capital we have to take into account the third rope in the knot that constitutes the labor theory of value: the worker’s subsistence, or “living.”

LIVING

The question of how the worker pays for the cost of subsistence is surprisingly absent from most of the debates about “free” digital labor. Perhaps because the majority of the authors who have contributed to these discussions often have secure academic jobs they fail to ask how those dedicated workers who built the Internet with their free labor actually made a living. Nor, among those who advocate a “Creative Commons” on the Internet, to which all authors are supposed to donate their work for free, is it ever made clear how these authors are supposed to pay their rent and provide for their families.

Yet the labor theory of value cannot be operationalized without this information. In order to know how much surplus value is generated, and how, from any given unit of labor, we need to know the cost of that worker’s reproduction, and how much of his or her working time is the “necessary labor time” required to sustain life. Only then can we see how much of the remainder is left over to be appropriated as surplus value and begin to formulate demands for its redistribution. This is not, of course, a mechanical calculation. It is perfectly possible for workers to be employed below the cost of subsistence. What does the employer care if they die, if there are plenty more where they came from? Equally, it is possible for well-organized groups of workers with scarce skills to punch above their weight and claim back from capital a higher wage than that required for bare survival—even one that allows them to employ other workers as servants. Nevertheless, capitalism as a system, in Marx’s model, requires a working class that is compelled to sell its labor to survive, just as it requires capitalists who are able to employ that labor to produce commodities whose collective value on the market exceeds the total wages of the workforce required to produce them. And it is the direct experience of being obliged to contest ownership of their labor time with the employer that produces the alienation likely to lead to class consciousness. The question of “necessary labor time” therefore cannot be ducked.

But even in Marx, this is a problematic concept. One reason for this is that although workers normally enter the labor market as separate individuals, their subsistence takes place in households where several people may cohabit.⁴² Because these households vary considerably in size and composition and in the number of members who engage in paid work, the same wage may have to stretch to cover the subsistence of varying numbers of people. Marx and Engels discuss the “natural” (*sic*) division of labor in

the family, which they regard as a form of “latent slavery” that can even be regarded as the origin of all property.⁴³ From this premise, that women and children are the property of the male head of household, it is possible for them to conclude that, when women and children enter the workforce, “formerly, the sale and purchase of labor-power was a relation between free persons; now, minors or children are bought; the worker now sells wife and child—he becomes a slave-dealer.”⁴⁴

In the twenty-first century, when women make up nearly half the workforce in most developed countries and only a minority are economically inactive, such an explanation will not suffice. Every worker who enters employment needs to be separately accounted for as an individual with his or her own cost of subsistence to be raised. The fact that people cohabit with other workers can, however, mean that this “necessary labor time” should be regarded as producing a fraction, rather than the whole, of any individual’s cost of subsistence. Or, in other words, that the concept of a “family wage” is redundant in most circumstances. A number of other factors have also intervened to make it difficult to identify a simple correspondence between what a person earns and what it costs for this person to survive, at least in situations where he or she is cohabiting with, or responsible for, economic dependents. These complicating factors include societal transfers in the form of pensions, welfare benefits, or tax credits, intergenerational transfers within families, remittances from migrants working abroad, and other forms of subsidy for some (or drains on the resources of others). Tax credits, the favored neoliberal model of social transfer, have played a particularly pernicious role in disguising not only the extent to which many jobs pay wages that are well below subsistence level but also in concealing from public awareness the reality that a large and growing proportion of social benefit payments go not to unemployed “scroungers” but to workers in employment.⁴⁵ Such transfers could thus be seen as having played an important role in blunting class consciousness and diverting workers’ energy away from direct conflict with their employers.

Despite very real difficulties of precise calculation, it is nevertheless possible to analyze the income of any given individual in any given household and produce some estimate of how this is generated. In the case of “free labor” on the Internet, it is likely that a number of different income sources may be involved. Some of this labor may be contributed by people who are economically dependent on their parents, some by people drawing

pensions or receiving some other form of welfare benefit, some by people with regular salaries from jobs that leave them with enough leisure time to blog, surf the Net, or write Wikipedia entries; some might be carried out by people (such as freelance journalists, consultants, or academics) whose jobs require them to engage in self-promotion. And others might be being supported from rents, gambling, proceeds from trade, crime, or other activities. What is clear is that they could not engage in this unpaid activity without some kind of subsidy from somewhere. Otherwise, how would they eat? Arguments that postulate the production of surplus value at a societal level from their labor seem untenable. Such arguments could also be seen as playing a similar role to societal financial transfers in diverting workers' attention away from confronting the employers directly expropriating their labor toward expressing their anger and sense of exploitation toward abstract targets, such as globalization. In failing to organize at the point of production, workers give away their strongest weapon: the power to withdraw their labor.

CLASS CONFIGURATION IN THE TWENTY-FIRST CENTURY

We live in a society where capital is highly concentrated, with most commodity production carried out by companies whose fates are largely shaped by financial investors. The commodities they produce, whether material or immaterial, are made available to us in a global marketplace, delivered through complex value chains in whose operation our own unpaid labor as consumers is increasingly implicated. Information and communications technologies have so affected the spatial and temporal division of labor that for many of us the boundaries between work and private life are inextricably muddled and few relationships are unmediated by them. In such a situation, are not the kinds of distinctions made in this essay not ridiculously nitpicking? Should we not just accept that all of us are, in some way or another, part of a huge undifferentiated workforce, producing undifferentiated value for an undifferentiated capital?

I argue that we should not. Capitalism is a social relationship in which workers play specific roles in relation to the production of specific commodities. This relationship relies crucially on workers' consent. If we cannot understand this relationship in its specificity, we cannot identify the

critical points in the processes of production and distribution at which workers' agency can be implemented to some effect. And if we cannot identify these, workers cannot understand their powers to consent to, or refuse, the specific deal on offer to them. This prevents them from actively renegotiating the terms of the deal—their only option for improving their situation. Nor can we see, without this knowledge, which groups of workers have interests in common, how these common interests might become mutually visible, or how their labor may be interconnected.

Each of the different forms of unpaid labor described above has an impact on paid labor, opening up the potential for tensions and fissures within the working class. Interns, working for nothing to make themselves employable, erode the bargaining position of paid workers in the same roles. Carrying out unpaid consumption work affects service workers by reducing overall employment levels and intensifying work through the introduction of new forms of standardization and Taylorization, leading to deteriorating working conditions. Writing Wikipedia entries, blogging, or posting video clips or photographs online without payment threatens the livelihood of journalists, researchers, or other creative workers who lack a subsidy from an academic salary or other source and rely on their creative work to provide an income. In many cases, the same people occupy several of these paid and unpaid roles in different capacities. Even more commonly, different members of the same household may be doing so. To regard unpaid workers as scabs who are undermining paid workers is of course much too simplistic, ignoring the imperatives that propel these behaviors and the broader reality that exploitation takes place in all of them, albeit in different forms. But an analysis that equates a common exploitation with an identical role in the generation of surplus value, and collapses all these separate positions into a common collective identity as a “multitude” makes it impossible to identify the point of production: the point where workers have the power to challenge capital—the center of the knot.

Starting from a detailed analysis of how value chains are structured, it is possible to begin to sketch out the lineaments of the class configuration that might confront us in coming years. However, this exercise has to be embarked on with extreme caution because, as noted earlier, many of us are engaged simultaneously or consecutively in a number of different forms of labor, with different relations to capital, or live in households where multiple forms of labor take place.

Leaving aside the rural populations that still subsist, at least in part, from their own direct labor on the land, the largest group in this emerging labor landscape, and by far the most rapidly-growing, is that of workers “inside the knot”: those who are employed by capitalist enterprises producing commodities, both material and immaterial. Many of these workers have been sucked into directly capitalist labor relations comparatively recently, coming to this work as migrants from the countryside or from other countries, being transferred from public sector employment, or recruited from a previous existence in petty commodity production. Not all of them have the status of permanent employees, with many paid by piecework rates or employed on a casual or temporary basis. They are, nevertheless, productive workers, directly producing surplus value. However, the ways in which their labor processes connect with each other are not obvious.

A product like a smartphone contains within it the results of the labor of miners, assembly-line workers, chemical workers, designers, engineers, call-center workers, invoice clerks, cleaners, and many more. Scattered in different countries, with different occupational and social identities, these workers may not perceive themselves as having anything whatsoever in common. Indeed, they may believe their interests to be directly opposed to each other. If and when they organize themselves, this might be on the basis of skill, occupation, or the company they work for, but it might also be on the basis of a shared regional, linguistic, or cultural identity, a shared political history or a response to a shared form of discrimination. What forms of solidarity or shared consciousness might emerge from these forms of organization is an open question.

Another open question is the extent to which managerial, professional, and technical workers within these value chains will identify with other workers rather than aligning themselves with the employer. These are volatile occupational groups, made up of people who, in the accelerating speed of technological change and economic restructuring, find many of their labor processes undergoing standardization and de-skilling even while new opportunities to become managers are emerging. On the one hand, their employers want to nurture them as sources of innovation; on the other, they want to cheapen their labor and drive up their productivity. Caught between these two contradictory imperatives, they may be put into a position where they have to decide whether to continue to internalize management priorities

and take the pain, to leave, to look for individualistic solutions, or to throw in their lot with other workers and resist.

Alongside, and overlapping with, this explosively growing body of workers “inside the knot” of capitalism are other groups less directly involved in capitalist social relations. These include people patching together a living out of petty commodity production, small-scale rent, or trade, a class that Marx assumed would die out but appears to have been given a new lease of life by the Internet, although it is doubtful whether such sources of income can ever supply a sustainable livelihood for more than a minority of the population. In many cases, it seems likely that this way of earning a living, often cobbled together from several different kinds of economic activity, is a transitional one, adopted by people who have been displaced from the formal labor market, or have not yet managed to enter it. It is not new. Working-class biographies have always thrown up many examples of people making ends meet by taking in lodgers, child-minding, pet-breeding, or making small items for sale. But it cannot be taken for granted that all such people will necessarily identify their interests with those of workers “inside the knot.”

Groups that are “outside the knot” also include people involved in paid reproduction work: public sector workers in the increasingly rare fields of service provision that remain uncommodified; domestic servants; and other service workers who are not directly involved in the market (such as workers in the voluntary sector). Their work is, of course, necessary for the reproduction of capitalism, but it is “outside the knot” according to my earlier definition. Again, these groups cover a diverse range of social identities and may not perceive themselves as having interests in common, either with each other or with workers “inside the knot.”

Added to these are large numbers of people who are not paid workers but who nevertheless also produce value, either in the form of reproduction, such as unpaid childcare or housework, or (externalized) production, in the form of consumption work. Many of these will be women, and their unpaid status may place them into relations of dependency on paid workers or on the state. History has given us many examples of reproduction workers throwing in their lot with the production workers their lives are linked with, for instance in the organization of miners’ wives in the UK coal-miners’ strike in the 1980s, and of consumption workers acting in solidarity with production workers, for instance in the consumer-based Clean Clothes

Campaign that organizes petitions and boycotts to improve working conditions for garment workers.⁴⁶

These are broad categories and a much more detailed mapping of the composition of these groups and their interrelationships with one another will be necessary to predict the class configuration that will confront us globally in the twenty-first century. Tedious though it may be to unravel the complexities of global value chains and position our labor processes in relation to them, this seems to be an absolutely necessary task if we are to learn how this system might be changed, act collectively to change it, and start to imagine what alternatives might be possible.

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7. The Underpinnings of Class in the Digital Age

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- “On the Digital Labor Question,” in *The Internet as Playground and Factory*, ed. T. Scholz (New York: Routledge, 2012); and Tiziana Terranova, “Free Labor,” in Scholz, *Internet as Playground and Factory*.
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 5. Alvin Toffler coined this term in his 1980 book *The Third Wave*, published by Bantam Books. It has since been taken up by a number of other writers working in a Marxist framework, including Christian Fuchs and Ed Comer.
 6. John Banks and Sal Humphreys, “The Labor of User Co-Creators,” using a term derived from C. K. Prahalad and V. Ramaswamy, “Co-Opting Customer Competence,” *Harvard Business Review*, January–February 2000.
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 17. A. Hearn, “Structuring Feeling: Web 2.0, Online Ranking and Rating, and the Digital ‘Reputation’ Economy,” *Ephemera* 10/3–4 (2010): 421–38.
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 19. Karl Marx, *Capital*, chap. 1, available at <http://www.marxists.org>.
 20. Huws, *Making of a Cybertariat*, 17.

21. This point is made a little differently in a discussion of the distinction between productive and unproductive labor by Marx in *Capital*, chap. 4.
22. Except in some special circumstances, such as when workers are paid to go on Facebook and click “Like” on commercial websites in the “pay per click” model. But here they are not employed by Facebook but by companies linked to these commercial websites that have some commodity to sell, so they should more accurately be regarded as belonging to the value chain of these commodity-producing companies.
23. Arvidsson and Colleoni, “Value in Informational Capitalism.”
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25. “All Eyes on the Sharing Economy,” *The Economist*, 9 March 2013.
26. I am indebted to Kaire Holts for drawing my attention to this explanation of the business model of reCAPTCHA by its originator, who also founded Duolingo, available at <http://www.willhambly.com>. See also the related video, available at <http://www.inmyinnovation.com>.
27. I have discussed the concept of the “business function” and its relation to Marxist analysis in several publications. See, for instance, U. Huws, “The Restructuring of Global Value Chains and the Creation of a Cybertariat,” in *Global Corporate Power: (Re)integrating Companies into International Political Economy*, ed. Christopher May, International Political Economy Yearbook, vol. 15 (Boulder, CO: Lynne Rienner Publishers, 2006), 65–84; and U. Huws, “The Emergence of EMERGENCE: The Challenge of Designing Research on the New International Division of Labor,” *Work Organisation, Labour and Globalisation* 1/2 (2007): 20–35.
28. I have analyzed the relationship of creative *labor* to capital elsewhere. See, for instance, U. Huws, “Expression and Expropriation: The Dialectics of Autonomy and Control in Creative Labor,” *Ephemera* 10/3–4 (2010).
29. Kittur et al., “The Future of Crowd Work,” 2013, available at <http://hci.stanford.edu>.
30. K. Holts, “Towards a Taxonomy of Virtual Work,” Hertfordshire Business School Working Paper, 2013.
31. Marx, *Grundrisse*, Notebook 5. It should be noted that this interpretation of this passage is disputed. Marx is often considered to be making a special exception of transport workers, perhaps because they were a group with strong potential trade union organization—a potential that was more than realized in the twentieth century when transport workers played a key role in industrial action. It is my view that his argument applies equally to other forms of labor involved in getting products to market, many of which were inconceivable at the time when he was writing.
32. Terranova, “Free Labor.”
33. B. Weinbaum and A. Bridges, “The Other Side of the Paycheck: Monopoly Capital and the Structure of Consumption,” *Monthly Review* 28/3 (1976).
34. See, for instance, Huws, “Domestic Technology.”
35. See Karl Marx, *Economic Manuscripts*, chap. 4, available at <http://www.marxists.org>.

36. I use the term “externalizing” here to refer to the ways in which employers increase the productivity of paid staff by transferring some or all of their unpaid tasks to unpaid consumers in the form of self-service, whether through the operation of machines such as ATMs or self-service supermarket or online activities such as booking tickets, filling in tax returns, or ordering goods.
37. Marx, *Economic Manuscripts*, chap. 2.
38. A. Ross, “In Search of the Lost Paycheck,” in Scholz, *Internet as Playground and Factory*, 15.
39. I have anatomized these in greater detail in Huws, “Expression and Expropriation,” 504–21.
40. Marx, “Productive and Unproductive Labor,” in *Economic Manuscripts*.
41. See, for instance, R. Perlin, *Intern Nation: How to Earn Nothing and Learn Little in the Brave New Economy* (London: Verso, 2011).
42. I have written more extensively about this in U. Huws, “The Reproduction of Difference: Gender and the Global Division of Labor,” *Work Organisation, Labour and Globalisation* 6/1 (2012): 1–10.
43. Karl Marx, “Division of Labor and Forms of Property—Tribal, Ancient, Feudal,” Part 1-A, *The German Ideology*, 1845, available at <http://www.marxists.org>.
44. Friedrich Engels, *On Marx’s Capital* (1877; Moscow: Progress Publishers, 1956), 89.
45. For more on this, see my blog post on “Hunger in a Supermarketocracy,” available at <http://ursulahuws.wordpress.com>. In the UK, according to HM Revenue and Customs, “the numbers of families without children receiving Working Tax Credits-only has risen over time, almost doubling from 235,000 in April 2004 to around 455,000 in April 2009 and now at just over 580,000 in April 2012” and “the numbers of families benefiting from the childcare element has consistently risen over time, from 318,000 in April 2004 to around 493,000 in April 2011.” By this date tax credits (paid to workers in employment) already accounted for 27 percent of all benefit spending—by far the largest single component. By comparison Job-Seekers Allowance (paid to the unemployed) accounted for only 4 percent. In the United States, similarly, many large companies rely on government-provided benefits, such as food stamps and Medicaid, to subsidize below-subsistence wages. For instance, Walmart employees are estimated to receive \$2.66 billion in government assistance every year, or about \$420,000 per store. See HM Revenue and Customs, *Child and Working Tax Credits Statistics*, Office of National Statistics, 2012; and Ryan, “Walmart: America’s Real ‘Welfare Queen,’” *Daily Kos*, 2012, available at <http://www.dailykos.com>.
46. See <http://www.cleanclothes.org>.