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FREE SOFTWARE, THE INTERNET, AND GLOBAL COMMUNITIES OF RESISTANCE

Sara Schoonmaker

Free Software, the Internet, and Global Communities of Resistance

This book explores software's pivotal role as the code that powers computers, mobile devices, the Internet, and social media. Creating conditions for the ongoing development and use of software, including the Internet as a communications infrastructure, is one of the most compelling issues of our time. Free software is based upon open-source code, developed in peer communities as well as corporate settings, challenging the dominance of proprietary software firms and promoting the digital commons. Drawing upon key cases and interviews with free software proponents based in Europe, Brazil, and the U.S., the book explores pathways toward creating the digital commons and examines contemporary political struggles over free software, privacy, and civil liberties on the Internet that are vital for the commons' continued development.

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To Hazel, Susan, Avery – mother, sister, daughter

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1 Hiding in Plain Sight

Software, Surveillance, and Capitalism in Everyday Life

Wherever you are in your daily travels, pause and take a look around. Even if you are trekking Africa's highest mountain, summiting Mount Kilimanjaro, it is likely that software is hiding in plain sight. You are probably equipped with state-of-the-art hiking gear, including a handheld Global Positioning System (GPS) unit that receives information from satellites and atomic clocks to find the location of the device and display it on a map. Your device locks onto several satellites, which can locate anyone on earth. It stores and locates waypoints to help you navigate the trail, or find your way back to camp. Your GPS unit offers a range of data, from maps to coordinates of elevation; latitude and longitude; temperature; distances and elevation; barometric pressure; sunrise, sunset, moonrise, and moonset; and logs of trip data for up to 48 hours. It allows you to send messages to similar devices, facilitating contact with other hikers if you get separated. At the end of the day, you may use the device for entertainment, playing geolocation games such as geocaching.

For those of us with more mundane pursuits, software is embedded in myriad activities. We are usually in range of cell phone towers emitting signals that smartphones can access. Indeed, for most of us, our smartphones are comparable to the hikers' handheld GPS systems. The phones themselves, as well as most of the apps, have GPS tracking to monitor where we are. They provide us with information about restaurants, ATM machines, gas stations, cultural attractions, and other sites along our path. Significantly, however, these phones simultaneously collect data about us. They collect data on where we go, what we spend our money on, what we look up on the Internet, the music we listen to, the people we text or email, and more. For users of social media, they document our posts, our photos, our likes, and other reactions to events and people. While hikers use handheld GPS devices to plot treks, consumers in towns and cities use smartphones to navigate our lives.

Wearable digital technologies such as smart watches and activity or fitness trackers collect data about our health and activity. These data document the number of steps we walk or run, our heart rate, sleep patterns, the steps we climb, and the calories we consume. Consumers employing such devices actively collect data about our physical activity, syncing the

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devices to our computers or smartphones to track long-term trends in our health metric data. In the process, Turkle (2015) views these consumers as developing an algorithmic or quantified self, treating bodies as computational objects, as sources of data. She urges us to reflect on the kinds of authority we give such technologies to shape our views of ourselves, our bodies, and our minds. For example, when we as consumers use such technologies, we may develop habitual ways of thinking about ourselves in terms of quantifiable units and achievements that can be scored. Such a process of quantifiable scoring implies that we can understand ourselves in those terms, tracking our progress over time.

Software is hiding in plain sight in cars. In 1977, General Motors (GM) introduced the first embedded software into its Oldsmobile Toronado model. By 1981, GM had integrated about 50,000 lines of software code to facilitate engine control in its diverse range of domestic passenger car models. It started a trend for other car manufacturers to follow. Since about 2000, software has powered new developments in cars, so that even basic models of cars include dozens of microprocessors and microcontrollers. Higher-end cars run on millions of lines of software code that monitor and control systems ranging from airbags to power trains (Madden 2015; Walls 2016).

Software is increasingly integrated into many objects in our homes, from microwaves to televisions, thermostats, “smart” toys, printers, and fax machines. Samsung markets the Family Hub smart refrigerator as a center of family life, allowing consumers to organize calendars, food shopping, watching movies, and listening to music. While such refrigerators are currently limited to the high end of the market, over the next decade, software will increasingly be integrated into a broader range of refrigerator models.

Smart speakers, or digital assistants, like Google Home and the Amazon Echo allow consumers to set alarms, stream music, podcasts, or audiobooks and access data on weather, traffic, and more. Amazon made the Echo widely available in the U.S. in 2015, expanding to Canada and the United Kingdom in 2016. The Echo can serve as a home automation hub, controlling several smart devices using the Alexa voice-controlled intelligent personal assistant service. Similar to the iPhone’s Siri assistant, Microsoft’s Cortana, and the “OK Google” voice recognition feature, the Echo is designed to respond to voice commands.

The prevalence of software in the above range of devices poses questions about privacy and surveillance. For example, since the Amazon Echo is continually listening and often recording, privacy advocates warn that it is vulnerable to surveillance. A company like Amazon could retain data recorded by all Echo users and potentially make that data available to other corporations or to government agencies such as law enforcement. Moreover, it is possible to gain remote access to a device like Echo to listen to private conversations. Similar to privacy concerns

related to webcams on laptops, such devices are vulnerable to remote recording by criminals or domestic surveillance by government intelligence agencies.

Such privacy concerns arose in 2017, when Mattel began marketing Aristotle, a voice-activated baby monitor that serves as a digital nanny. Mattel provided information about the product for an online article in *CISION PR Newswire* (2017), describing Aristotle as “designed with a specific purpose and mission: to aid parents and use the most advanced AI [Artificial Intelligence]-driven technology to make it easier for them to protect, develop, and nurture the most important asset in their home – their children.” Mattel developed the Aristotle platform by partnering with Microsoft to create an Artificial Intelligence (AI) system geared toward babies, as well as older children. The AI system integrates Microsoft Cognitive Services, as well as search capabilities through the Bing search engine. Aristotle includes a hub with a smart light system, including lights for reading and diaper changing, as well as a night light. Moreover, Aristotle includes multiple color lights “specifically designed as a dynamic feedback system tied to the AI” (*CISION PR Newswire* 2017). To develop this AI hub, Mattel partnered with Qualcomm Technologies. The corporate designers integrated a Wi-Fi camera with object recognition, so that Aristotle can turn on a lullaby and adjust the room’s lighting if a baby starts to cry. These designers included features for toddlers and older children, so that Aristotle’s lights turn color during interactive sessions. In these sessions, Aristotle asks the child questions; if the child answers correctly, the lights turn green. From Mattel’s perspective, “Aristotle is designed to comfort, entertain, teach, and assist during each developmental state – evolving with a child as their needs change from infancy to adolescence” (*CISION PR Newswire* 2017).

Consumer advocacy groups such as the Campaign for a Commercial-Free Childhood (CCFC) (2017) critiqued the Aristotle platform as engaging in surveillance. They viewed the device as a potential threat to privacy, since it could collect and store data about children’s activities. Since Aristotle is linked to other applications and online retailers, that data can be shared with corporations and used for targeted advertising to children and their families.

Indeed, from Aristotle to the Echo, from smartphones to cars, televisions, and numerous “smart” objects in our lives, software is hiding in plain sight. Its pervasive presence raises questions about who controls that software, as well as the massive amounts of data it is used to collect about us. Edward Snowden (2016) argues that many consumers are concerned about whether their devices are secure from potential intrusions on their privacy. At the same time, however, they may not consider potential problems with control over those devices. For example, iPhones are known for their reliability and security. Consumers may use them with a sense of confidence that Apple will protect their privacy and

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provide a reliable, secure device. Despite this security, however, Apple routinely pushes software updates that change the configuration of the phones. Snowden (2016) challenges us to consider whether a device is truly secure when we do not know what it is doing. If we lack the knowledge to understand how it is configured, or the option to make choices about that configuration, we lack control over it. We simply consume the device as a “black box,” trusting the corporation to set it up for us.

Software thus raises questions about knowledge, power, and control. Many of those questions are linked to surveillance, since software enables the collection of data about our activities, our health, and our relationships. These data are vulnerable to surveillance, posing potential threats to civil liberties such as the right to privacy. Moreover, these data can be accessed by corporations to target us with advertising. Such data are central to marketing and profit-making in contemporary capitalism. As Columbia University law professor and privacy advocate Eben Moglen (2011) argues,

Software is what the 21st century is made of. What steel was to the economy of the 20th century, what steel was to the power of the 20th century, what steel was to the politics of the 20th century, software is now. It is the crucial building block, the component out of which everything else is made, and, when I speak of everything else, I mean of course freedom, as well as tyranny, as well as business as usual, as well as spying on everybody for free all the time.

To understand the significance of software’s pervasive presence in everyday life, we thus need to analyze software as central to processes of production, marketing, and other aspects of social, cultural, and political life in contemporary capitalism. As software hides in plain sight, processes of surveillance and capitalist production are even more deeply hidden. Exploring the connections between software, surveillance, and capitalism is key to grasping contemporary relations of power, as well as strategies for resistance and transformation.

Informational Capitalism and Globalization

Contemporary examples of the ubiquity of software in daily life are an acceleration and intensification of the dynamics of capitalist development that scholars have analyzed for many years. We can understand the current significance of software more fully when we place it in the context of these historical dynamics. World systems theorists chronicle the development of capitalism over a span of 500 years, through cycles of expansion of world trade and production, as well as crises of overaccumulation and competition (Wallerstein 1974, 1999; Arrighi 1999). Marx and Engels highlight the nature of capitalism as a global system, where

the process of colonial expansion laid the foundation for the development of a world market. In the *Communist Manifesto*, they argue that

The market has given an immense development to commerce, to navigation, to communication by land. This development has, in its turn, reacted on the extension of industry; and in proportion as industry, commerce, navigation, railways extended, in the same proportion the bourgeoisie developed, increased its capital, and pushed into the background every class handed down from the Middle Ages.

(Accessed June 1, 2017, www.marxists.org/archive/marx/works/1848/communist-manifesto/ch01.htm#007)

Capitalism is fraught with contradictions, rooted in the dynamics of the profit motive that push capital to constantly seek new markets and ways to exploit human and natural resources.

Communications and transport played a key role in facilitating capitalism's historical development as a global system. Since the mid-nineteenth century, capitalist enterprises operating in different parts of the world exchanged information through communications systems, from the telegraph to the telephone and eventually the Internet (Hirst and Thompson 1999). As Murdock (2014, 138) argues, “[c]apitalism has always relied on advanced communications systems to track, collate, and co-ordinate the dispersed production and consumption activities it sets in motion.” In the chapter on capital in the *Grundrisse Notebook V*, Marx (1973) discusses how communications and transportation systems facilitate processes of capital circulation and play a key role in capitalism's global dynamic. He argues that

while capital must on one side strive to tear down every spatial barrier to intercourse, and conquer the whole earth for its market, it strives on the other side to annihilate this space with time, i.e. to reduce to a minimum the time spent in motion from one place to another.

(Marx 1973, 539)

This dynamic accelerates as capital develops on a global scale. According to Marx, as capital increasingly expands into the international market, “which forms the spatial orbit of its circulation, the more does it strive simultaneously for an even greater extension of the market and for greater annihilation of space by time” (Marx 1973, 539).

Capital thus pursues the construction of communications and transportation systems to create the conditions for commodities to circulate on the market. Building upon this analysis, we can understand struggles by corporations to annihilate space with time by promoting state-of-the-art means to communicate about their operations, as well as to transport

commodities. Such innovations facilitate what Harvey (1999, 118) calls “successive waves of time-space compression.” The importance of communications and transportation thus extends from early sea routes and highways to contemporary struggles to establish the political conditions to access the Internet.

Indeed, since the 1970s, the convergence of telecommunications and computing made digital technologies increasingly central to economic, political, social, and cultural life. This convergence eventually made it possible for the Internet to become a vehicle for both communications and the transport of digital commodities, as consumers downloaded music and other products and services in digital form (Schoonmaker 1993, 1994, 2002). Corporations, governments, producers, and consumers rely on access to electronic information to conduct their major activities. To grasp this increasing centrality of information to capitalism on a global scale, Castells (1996) refers to it as global informational capitalism. Fuchs (2016, 2) highlights informational capitalism as one of capitalism’s multiple dimensions, arguing that “[c]ontemporary capitalism is an informational capitalism just like it is a finance capitalism, imperialist capitalism, crisis capitalism, hyper-industrial capitalism (the importance of fossil fuels and the mobility industries), etc.” Fuchs (2014) notes that information technologies, science, theoretical knowledge, and knowledge labor constitute key productive forces of informational capitalism. As Sassen (2005, 54) argues, information superhighways bring “higher levels of control and concentration in the global market.”

Informational capitalism is thus one of capitalism’s multiple dimensions. It is constructed through processes of struggle, within the broader context of neoliberal globalization as the current dominant form of capitalism. As Fuchs (2014, 44) argues, neoliberalism is a “mode of existence” or “regime” of global capitalism. Since the U.S. government has strongly promoted this neoliberal regime, it is also known as the “Washington Consensus” (Langman 2012). Harvey (2005, 2) traces the rise of neoliberalism since the late 1970s, as a system “characterized by strong private property rights, free markets, and free trade.” Neoliberal globalization, or what McMichael (2000, 2017) calls the globalization project, thus has a number of key characteristics. Economically, interests of transnational corporations take priority over those of smaller, local firms. Politically, trade agreements or other legal conditions often support the proprietary interests of transnational firms or governments in the global North rather than small producers or grassroots groups, particularly in the global South. Culturally, values of sharing and community access tend to be subordinated to values prioritizing high levels of commodity consumption.

Equally important, neoliberalism is constructed through discourse, or narratives of power and knowledge. Building on Foucault (1978), I employ a poststructuralist perspective that power and knowledge are

inextricably linked through discourse. In discourse, social actors draw upon cultural values and language that resonate with particular ways of understanding the social world. Through discourse, they articulate their positions on the key issues at stake (Foucault 1978; Escobar 1995; Schoonmaker 2002). For example, the discourse of neoliberalism is rooted in the assumption that free trade is the most rational approach to structuring global markets, largely because it protects the proprietary interests of corporations in maximizing their profits. Proponents of this discourse depict any state attempts to regulate markets through protections for local industries, workers, or environmental health as barriers to trade that undermine global economic growth. Over the years, such proponents have included the World Bank, the International Monetary Fund, and U.S. presidents such as Ronald Reagan, George H.W. Bush, Bill Clinton, George W. Bush, and Barack Obama. Support for the neoliberal discourse is sometimes partial and complicated; such was the case with President Obama's advocacy for the neoliberal Trans-Pacific Partnership (TPP) global trade agreement and simultaneous support for some protections for the environment and local industry.

Escobar (1995) highlights the importance of understanding the economy as a discourse imbued with cultural values and meanings. People both respond to and are shaped by these cultural meanings as they participate in processes of socialization and enculturation. Escobar (1995) thus views the economy as a cultural production, through which we become particular kinds of people who value practices like economic productivity and success, as well as engaging in those practices through work and consumption. A poststructuralist perspective thus allows us to understand economic and political structures as constructed through discourse as forms of knowledge and understanding, as well as through material practices. In the next chapter, I discuss the key role of the proprietary, freedom, and sovereignty discourses in the development of the digital commons. Indeed, the proprietary discourse is closely linked to the neoliberal discourse, since both are rooted in values of protecting corporate proprietary interests by boosting profits and expanding into new markets.

Global Communities of Resistance

Due to their centrality to informational capitalism and neoliberal globalization, software and the Internet have become key terrains of struggle over the past decades. Free software and net neutrality advocates work simultaneously to create alternatives to informational capitalism and neoliberal globalization. They forge alternatives rooted in the freedom to share and collaborate, as well as respect for sovereignty and civil liberties like the rights to free speech and privacy. Like other projects seeking to develop alternative forms of globalization from below, they mobilize participants to resist neoliberal globalization (Della Porto, Andretta,

and Mosca 2006; Langman 2012). In the process, free software and net neutrality advocates develop communities that involve what Sassen (2005, 54) calls “distributive outcomes – greater participation of local organizations in global networks.”

These communities resonate with Portes’ (2000, 254) conception of globalization from below, where common people respond to neoliberalism by “creat[ing] communities that sit astride political borders and that, in a very real sense, are ‘neither here nor there’ but in both places simultaneously.” While some movements promoting globalization from below focus on environmental justice, or the rights of the poor, workers, women, immigrants, or indigenous people, free software and net neutrality advocates struggle to promote the development of free software and conditions for equal access to the Internet. They thus focus on questions central to informational capitalism.

Portes (2000) highlights the power of such diverse transnational efforts to develop alternative forms of globalization from below. He argues that

[m]ultinational elites and national governments may believe that the process of transnationalization is still too feeble to pose any significant challenge to the status quo. In reality, the tiger may have already left the cage, and there would be little point in closing it after him.

(Portes 2000, 266)

Throughout this book, I explore a range of ways that free software and net neutrality communities engage in local actions linked to global projects, thus developing alternative forms of globalization from below. They are examples of “tigers” that have created global communities of resistance. These communities challenge neoliberalism and informational capitalism with vibrant forms of peer-produced software, free culture, and other contributions to the digital commons. Like other projects seeking to develop alternative forms of globalization from below, they mobilize participants to “redress their grievances and foster more democratic, participatory, humanistic, egalitarian, ecologically sound alternatives” to neoliberalism (Langman 2012, 865).

The Argument

In the following pages, I examine the ways that global free software and net neutrality communities of resistance challenge neoliberalism and informational capitalism. These challenges are rooted in a common goal of developing a digital commons, where all participants can access, use, modify, and share software and the Internet. In the next chapter, I highlight the meaning and significance of the commons, as well as the methods used in this study. I analyze the development of the digital commons, based on two sets of struggles. First, free software advocates in

the U.S. created free software as an alternative form of property distinct from private property. Second, researchers in Brazil advocated opening up access to emerging global computer networks. These two groups did not know each other or coordinate their activities; however, they laid the foundations for the development of the digital commons. Indeed, the digital commons are based upon free software and an open, decentralized Internet. Proponents of the digital commons continued to develop it after 2001, by forming Creative Commons and Wikipedia.

As participants in diverse free software projects collaborate to produce the software, they develop global communities. In Chapter 3, I analyze the possibilities and challenges involved with developing free software communities by comparing the Debian and Drupal projects. Both projects involve participants from around the world who coordinate their work over the Internet. They engage in myriad activities, from coding the software itself to writing documentation and translating programs into different languages to make them accessible to wider groups of people. Both projects involve a mix of forms of software production, combining work by unpaid peer producers with work by paid developers. The key difference between the projects is the nature of the software that they produce. Debian software allows developers to include proprietary elements that restrict users' freedoms. Drupal software is free software, contributing to the digital commons by allowing users freedom to access, modify, and share the software without restrictions. Moreover, Drupal project participants made conscious efforts to expand their project beyond North America and Europe into the global South. In the process, they forged a global community that implicitly resisted neoliberalism and informational capitalism. They did not explicitly organize political resistance; however, by building free software and extending their global community, they created an alternative form of globalization from below.

Free software communities thus play key roles in developing the digital commons. In Chapter 4, I explore the ways that communities work to organize themselves to protect the freedoms of their participants. I focus on the case of LibreOffice and The Document Foundation, whose participants created the project by splitting off from the OpenOffice.org community. They were concerned about increasing corporate influence over OpenOffice.org that could undermine the freedom to access, modify, and share the software. They created an innovative new organizational structure to support these freedoms and to work for values of digital inclusion central to the digital commons. In the process, they also constituted an implicit global community of resistance to neoliberalism.

Free software itself, as well as the community organizations required to produce it, thus contribute to developing the digital commons. Because software is central to production in informational capitalism, however, conditions for software use and production become sites for political struggles. Corporations and governments often promote the interests of

proprietary software, thus undermining free software. In response to these threats, free software activists mobilize to protect and defend the conditions to produce free software. In Chapter 5, I highlight the efforts by free software activists in France to organize such political action, building alliances with free software activists in other parts of Europe as well as the U.S. In the process, these activists forged a free software global community of resistance with an explicitly political focus.

As noted above, the Internet is an equally important foundation of the digital commons as free software. Moreover, both software and the Internet are key productive forces for informational capitalism. As in the case of software, corporations and governments often promote proprietary interests in accessing the Internet. In response, net neutrality activists struggle to shape the political conditions for Internet access. They fight to protect the Internet as an open, decentralized system that all users are free to access on an equal basis. In the process, they struggle against corporate and government practices that prioritize profit and collect data about consumers and citizens. They view many of these practices as forms of surveillance that threaten civil liberties and democratic institutions. In response to these threats, net neutrality activists employ strategies to gain greater control over the existing telecommunications infrastructure. They seek to evade practices of surveillance, as well as to devise alternative telecommunications infrastructures of their own. In the process, they create explicit global communities of resistance to defend the Internet as a basis for the digital commons.

In the following chapters, I thus explore key dynamics of struggle over neoliberalism and informational capitalism. I highlight examples of key projects and activist strategies that contribute to the development and defense of the digital commons. These projects are beautifully varied, created by participants in many countries around the world. They are diverse and global. They are not intended to be exhaustive, however; there are a multitude of other such projects around the world. Over time, such projects change, as advocates of free software and net neutrality continue to design inventive ways to build, share, and transform software and the Internet. As danah boyd (2014, 27) notes in her study of teen use of social media, these technological platforms are “moving landscape[s].” Like social media, particular free software projects or activist strategies will change over time; however, “the core principles and practices...are likely to persist” (boyd 2014, 27). Indeed, in the case of implicit and explicit free software and net neutrality global communities of resistance, they are likely to persist because they target core dynamics of neoliberalism and informational capitalism. Until those systems are radically transformed, such communities are likely to continue to create imaginative ways to contribute to developing the digital commons.

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