HACKERS, CYBORGS, AND WIKIPEDIANS: THE POLITICAL ECONOMY AND CULTURAL HISTORY OF WIKIPEDIA

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This dissertation explores the political economy and cultural history of Wikipedia, the free encyclopedia. It demonstrates how Wikipedia, an influential and popular site of knowledge production and distribution, was influenced by its heritage from the hacker communities of the late twentieth century. More specifically, Wikipedia was shaped by an ideal I call, “the cyborg individual,” which held that the production of knowledge was best entrusted to a widely distributed network of individual human subjects and individually owned computers. I trace how this ideal emerged from hacker culture in response to anxieties hackers experienced due to their intimate relationships with machines. I go on to demonstrate how this ideal influenced how Wikipedia was understood both those involved in the early history of the site, and those writing about it. In particular, legal scholar Yochai Benkler seems to base his understanding of Wikipedia and its strengths on the cyborg individual ideal. Having established this, I then move on to show how the cyborg individual ideal misunderstands Wikipedia’s actual method of production. Most importantly, it overlooks the importance of how the boundaries drawn around communities and shared technological resources shape Wikipedia’s content. I then proceed to begin the process of building what I believe is a better way of understanding Wikipedia, by tracing how communities and shared resources shape the production of recent Wikipedia articles.
For my father, who taught me that creativity is a human right, not a property right.

and

For my mother, who taught me that service to the community is what makes us really human.
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CHAPTER ONE – INTRODUCTION AND LIT REVIEW

This dissertation uses the techniques of cultural studies to explore the history and social impact of the Wikipedia encyclopedia. In particular, this study is interested in how Wikipedia is built and maintained, that is to say, its method of production. If Wikipedia were just an Internet-accessible encyclopedia, its growing popularity as a source of knowledge would not be terribly remarkable. However, Wikipedia is produced through an interactive method, and this method marks a profound shift from the traditional techniques of encyclopedia writing. Unlike past encyclopedias, such as the renowned Britannica, which were authored and edited by a hierarchically organized group of professional writers and editors working for a single firm, Wikipedia is produced by a loosely organized, largely egalitarian group of volunteers. In the site’s motto, Wikipedia brags that “anyone can edit” Wikipedia. Furthermore, Wikipedia's text is always in the process of being produced. Unlike a traditional encyclopedia that, once it is published, establishes the information presented in its articles as fixed objects of knowledge, at least until such a time as properly authorized experts are assembled to produce a new edition, Wikipedia, has no fixed editions, rather the information on the site remains fluid, alterable at any time.

We can see the unique potentials and dangers of this method at work in the case of a Wikipedia article that rose to prominence during the 2008 U.S. presidential campaign. On August 29, 2008 John McCain, then the Republican nominee, announced that he had selected Alaska governor Sarah Palin to be his running mate. News programming on the night of the 29th was dominated by this development, understandably so, given that the nearly unknown Palin was

1 As we will see, this isn’t entirely true, there are some limitations on who can and cannot edit Wikipedia. Nonetheless, Wikipedia is open to being altered by a far larger pool of potential contributors than earlier encyclopedias.
only the second woman to be nominated to run for the vice presidency of the United States, and the first to run as a Republican. Among the many stories to air was a small segment on National Public Radio’s program “All Things Considered” discussing changes made to the article on Palin’s article on Wikipedia (“Palin's Wikipedia Entry Gets Overhaul,” 2008). The NPR story hinted at possible scandal because the Wikipedia article on Palin had undergone a frantic round of editing the night before McCain made his announcement (an announcement that took almost everyone by surprise), and had been altered in a way that tended to enhance Palin's image. Some Wikipedia editors, NPR reported, believed that persons connected to the McCain campaign had modified Palin’s article.

It is worth noting here that the fact of a national news program willing to devote time to the ins and outs of Wikipedia editing, a practice which can border on the arcane, on the day of a historically significant political announcement is one indication of the cultural salience Wikipedia has achieved in its nine years of existence. More importantly, this example demonstrates how Wikipedia's method of production works in practice, and what the potential cultural implications of this method are. Unlike an article on Palin in a traditional encyclopedia, which would have been written by authorized and presumably “disinterested” experts years after the events of the campaign, the article on Palin was produced in near real-time by assorted volunteers. As the scandalized correspondents at NPR suggested, these volunteers may have included members of the McCain campaign, or others motivated to burnish Palin's image to better serve their own interests.

For critics of Wikipedia, this ability of interested parties to alter articles represents a critical weakness in Wikipedia's method of production. However, both these critics and partisans
interested in altering Wikipedia to reflect their beliefs are oversimplifying the actual productive practices of Wikipedia. In the case of the article on Sarah Palin, whoever altered the article on the evening before McCain’s announcement campaign erred if they hoped that readers drawn to the article by media coverage of Palin would be seeing their preferred revision of the article. Instead a flurry of editing activity by other interested parties quickly changed the information presented, as Wikipedia volunteers tried to bring the article into line with their professed ideal of “neutral” information. In the week after Palin was announced as the vice presidential nominee, her article was edited over a thousand times, attracting dozens of interested volunteers. On the article’s “talk page,” a special page that the Wikipedia software creates for each Wikipedia article to provide a space for volunteers working on that article to communicate with one another, volunteers from varying points of view squared off, trading arguments about why certain edits to the article did or did not accurately portray Ms. Palin. Ultimately, the article represented the result of a process of negotiation and compromise among various interested parties, rather than the preferred view of any of them.

We can see, then, how Wikipedia relies on a multitude of volunteers for its productive process, rather than singular experts. This makes Wikipedia not only radically different from prior encyclopedias, but representative of a new, and possibly radically different means of creating knowledge. This means of information production did not originate with Wikipedia. This honor instead belongs to the world of Free and Open Source Software (FOSS). Emerging from obscurity in the early 1990s, FOSS demonstrated the ability of a geographically dispersed group of volunteers to create a large, complex informational product with the success of such software as the GNU/Linux operating system and the Apache webserver. It was these successes
that first suggested to scholars that large, loosely coordinated groups of individuals might have
the potential to engage in large-scale productive activity. One of the most important of these
scholars was law professor Yochai Benkler, who devoted his 2006 magnum opus, *The Wealth of
Networks*, to explaining that this new productive method, which he dubs “peer production,” is
playing an increasingly important role in our society.

In this dissertation, I employ Benkler’s term, “peer production,” to describe Wikipedia's
productive mode. My analysis takes as its starting point Benkler’s sense that peer production is
emerging as an important productive force in conjunction with digital media, a sense he shares
with a variety of other scholars (Hippel, 2005; Jenkins, 2006; Lessig, 2004; Shirky, 2008).
However, in reading Wikipedia as an example of peer production through the lens of cultural
studies, I have arrived at some very different conclusions about the nature of this productive
method. This dissertation argues that the roles of the individual and private property in peer
production are not quite what Benkler believes them to be. As I will demonstrate in detail later in
this chapter, much of Benkler's understanding of peer production rests on the notion that
individuals empowered by their private ownership of the basic physical units of information
production, internet-connected personal computers, will be able to collaborate in a highly
egalitarian way to produce large, complex pieces of information, which can then be held in
common. This dissertation does not seek to undermine the notion that information can and
should be held in common, indeed I embrace this ideal of communal sharing. However, my
investigation of Wikipedia suggests that Benkler's focus on the technologically empowered
individual as the driver of peer production and the source of its virtues may be the result of a
cultural narrative about individuals and individual bodies, rather than an accurate depiction of the
condition of the community on Wikipedia. This individualistic ideology does not seem to be limited to theorists studying peer production. Instead, practitioners of peer production, including early Wikipedia editors, seem to have understood their own community in terms of technologically empowered individuals.

In this study, I employ the theoretical tools provided by Bruno Latour and N. Katherine Hayles to trace the historical origins of the focus on individualism at the heart of peer production's theory and practice. I seek to demonstrate how this focus is not simply a mistake or a case of false consciousness, but a reaction to anxieties felt by computer hackers at the close of the twentieth century. I go on to show how this focus on the technologically empowered individual, which I call “cyborg individualism” shaped how both Benkler and early Wikipedia editors understood Wikipedia, concealing the real role of communal action and shared resources in this community.

In this introduction I will begin by briefly defining peer production and cultural studies and then demonstrating how these two bodies of knowledge share some important features, features that I believe make a cultural studies reading of the peer production phenomenon all the more important. I will then move on to review the existing literature on peer production, and on Wikipedia. I will show how this literature establishes important background facts useful to this dissertation, as well as how a gap remains for this study to fill. Finally, I will provide an overview of my remaining chapters.

**Defining Cultural Studies and Peer Production**

Interdisciplinary and somewhat idiosyncratic, Cultural Studies can be a somewhat slippery academic field. Cultural Studies scholars may focus their research on pop cultural texts,
literature, history, media or a variety of other objects of study. They draw from a wide range of philosophers, sociologists, linguists, and others in building theoretical frames for their work. Thus, before I explain how and why I chose to read Peer Production “through the lens” of Cultural Studies, it behooves me how I am defining Cultural Studies as a field. For me, the interdisciplinary field of Cultural Studies really begins to define itself in the work of the Birmingham School (including Raymond Williams, E.P. Thompson, and Stuart Hall) in the 1950s. Cultural studies has also been heavily influenced by the Continental Philosophy of the 1960s and 1970s, and by critical theory arising out of the cultural and social movements of the last quarter of the 20th century, including Postcolonial theory, Feminist Theory, and Queer Theory.

These diverse fields share one key insight in common, the notion that the realm of culture, the production of texts – from pop culture to mass culture, high culture to low – that convey human meaning, have a key role to play in both the preservation of status quo power relationships within a society, and their potential disruption. For the early and influential Cultural Studies scholar Stuart Hall, the turn to culture was inspired by the earlier Italian Marxist writer Antonio Gramsci. Hall writes that he turned to Gramsci because, "certain strategies of evasion had forced Gramsci's work, in a number of different ways, to respond to what I can only call [...] the conundrums of theory, the things which marxist theory couldn't answer, the things about the modern world which Gramsci discovered remained unresolved within the theoretical framework of grand theory - marxism - in which he continued to work" (Hall, 1996a, p 266). Cultural Studies, then, might be thought of as an investigation into how texts shape systems of power and production, and vice versa.
Peer Production, in many ways, serves as a counterpoint to the Cultural Studies project. Where Cultural Studies has attempted to understand the relationship between power, production, and texts, Peer Production has attempted to imagine new structures of power and organization that might be employed in the production of texts. I follow Yochai Benkler in taking Peer Production to mean, "a new modality of organizing production: radically decentralized, collaborative and nonproprietary; based on sharing resources and outputs among widely distributed, loosely connected individuals who cooperate with each other without relying on either market signals or managerial commands" (Benkler, 2006, p. 60). I will ultimately take issue with several features of Benkler’s definition, in particular his assertion that peer production is “radically decentralized,” however this definition serves as a useful starting point for identifying the current understanding of the productive method at work on Wikipedia and elsewhere.

The term peer production also needs to be located within a particular historical context to be meaningful. Throughout history, a wide variety of methods of production have been experimented with, many of which incorporated forms of shared property and non-hierarchical organization. I will use peer production to refer to a method which has evolved in the developed world in conjunction with digital media over the course of the last 30 years. The history of this productive mode can be traced to its origins in the Free/Open Source Software movement (FOSS)."The quintessential instance of commons-based peer production,” Benkler writes, "has been free software" (Benkler, 2006, p. 63). He later argues that, "Free software has played a critical role in the recognition of peer production, because software is a functional good with measurable qualities" (Benkler, 2006, p. 64). Legal scholar Lawerence Lessig, perhaps the best
known advocate for modifying Intellectual Property law to make it more favorable to the
practices of peer production, attributes Free Software Richard Stallman as the source of many of
his own theoretical insights. In his introduction to his 2004 book *Free Culture*, Lessig writes,
"the inspiration for the title and for much of the argument of this book comes from the work of
Foundation's General Public License was the first intellectual property licensing scheme
designed to guarantee work released into a shared commons of information resources could not
later be appropriated from that commons as private property, an important foundation for peer
production (Benkler, 2006; Lessig 2004; Kelty, 2008; Stallman, 2002). The ability of volunteers
spread throughout the world to coordinate work on the free operating system called Linux was
one of the first examples of peer production in action, and one that convinced many that a new
and interesting productive method was emerging (Benkler, 2006; Weber 2004; Lessig 2004;
Raymond 2000a).

**Common Features of Cultural Studies and Peer Production**

Cultural studies and peer production came of age in the same historical epoch, thus it
should not be surprising that they respond to some of the same anxieties. The period in which
both cultural studies and peer production emerge and come to prominence is one heavily
influenced by a global conflict between two rival political-economic systems: industrial
capitalism, and state socialism. Cultural studies and peer production each take a critical stance
(though not the same critical stance) with regards to both of these systems, and a common
project of working towards an as-yet-unrealized better system of political economy. This
correlation is simple, and can only be made in the broadest terms, but it is significant because the
different moves made toward a new, alternative political economy made by peer production and cultural studies complement each other in important ways.

Advocates of peer production, including James Boyle, Yochai Benkler, Larry Lessig, and Henry Jenkins, have argued that, under certain conditions, the traditional capitalist organizational methods of markets and firms may not be necessary for the process of producing information - whether that information is computer software or encyclopedia entries. Rather, if information is treated as a common resource, rather than as strictly controlled individual property, decentralized production will flourish as a variety of actors produce and share information for a variety of reasons. At first glance, this is exactly what appears to be happening on Wikipedia, where a wide variety of actors from all corners of the globe and from many walks of life: political operatives, concerned citizens, devoted fans, passionate scholars, and many others, contribute to the project on a volunteer basis and for their own reasons. The products of their labor are held in common, using a legal license developed by Creative Commons\(^2\) that ensures that no one can treat Wikipedia articles as their exclusive property. The actual, physical computers that enable Wikipedia to exist are owned and operated by a not-for-profit foundation, called the Wikimedia foundation.

This decentralized, anti-propertarian method of producing information would, on its surface, seem to be of great interest to the academic discipline known as cultural studies. After all, the theorists cultural studies draws on have often concerned themselves with criticizing how mass-culture lends itself to processes of domination and exploitation: from Adorno and Horkheimer’s early work on the mesmerizing effects of the "culture industry," to Stuart Hall’s

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\(^2\) Prior to the adoption of the current Creative Commons license, Wikipedia employed a license developed by the Free Software Foundation called the GFDL (GNU Free Documentation License)
exploration of how the consumers of mass media might construct "oppositional codes" allowing them to resist the ideological biases of these media, to Delueze and Guattari's celebration of the subversive potential of the "rhizome," which connects everything to everything else, over the top-down hierarchy of the "tree." Wikipedia, and the peer production form in general, would seem to have great potential to be put to use in the cause of the greater freedom and social justice cultural studies seems devoted to. Indeed, those involved in peer production have often themselves made similar calls for freedom and social justice. Wikipedia co-founder Jimmy Wales has often been heard to remark that the goal of the Wikipedia project is to "deliver the sum total of human knowledge to every human being on earth," and Wikipedia's explicit policy of including multiple points of view on a variety of topic seems broadly compatible with Foucault's notion, cherished by cultural studies, of the "heterotopia" in which different systems of knowledge and power co-exist freely.

On closer examination, however, the relationship between peer production and cultural studies is more complex. Whereas cultural studies, for all of its attempts to re-invent Marx, remains a discipline in which Marxist language and thought remain an important heritage, the practitioners of peer production tend to treat Marx and Marxism as nothing but specters to be exorcised. Peer production, for all of its apparent post-modernism, remains a space where modernity and liberalism remain cherished ideals (Coleman, 2005; Kelty, 2008). Finally, whereas peer production is a practical method for producing information, cultural studies is a largely theoretical discipline.

These differences, however, are exactly why peer production and cultural studies can be, and should be, fruitfully combined. The theoretical insights of cultural studies, unbound by any
practical need to “get things done,” can provide the means for pushing peer production beyond its current envelope, and push it to more completely live up to its idealistic goals of freedom and justice. Peer production, in turn, can provide cultural studies with practical methods that might be employed in the cause of theoretical ideals, and real-world experience that can help refine and expand otherwise abstract theoretical notions. This study hopes to be a first step towards exactly this sort of intersection between peer production and cultural studies. To better identify exactly how this dissertation will intervene in both of these fields, I will now review three related bodies of literature and demonstrate how this study fits an existing gap in each. I first review the work of theorists writing in both the cultural studies and peer production traditions who engage with the question of private property. The very different ways that cultural studies and peer production have dealt with the question of property informs the way this study investigates the relationship between Wikipedia and its physical means of production. I then move on to explore how both cultural studies and peer production theorists deal with the regulatory power of non-state agencies. The interesting parallels between these bodies of work inform the way this study examines the role of power on Wikipedia. Finally, I go on to review the existing literature on Wikipedia from a wide variety of fields. I find that this literature provides a variety of important background facts on the Wikipedia phenomenon, but also demonstrates why a cultural studies informed reading of Wikipedia is badly needed.

**The Answers of Cultural Studies and Peer Production to the Problem of Property**

Both peer production and cultural studies confront the issue of private property. Both peer production and cultural studies have often been critical of private property regimes and the inequalities of power and privilege these regimes can serve to create. They differ however, in at
least one crucial respect: peer production has, for the most part, carefully limited its critique of private property to intellectual property systems, whereas cultural studies has tended to mount a broader assault on the notion of private property. This contrast raises important questions for this dissertation to investigate.

It is not difficult to find peer production theorists drawing a "bright line," to use the legal term, between the intellectual property regimes they wish to modify or overthrow, and the physical property regimes they wish to leave intact. In *Code and Other Laws of Cyberspace*, Lessig makes the case that physical and intellectual property are fundamentally different:

> The law has a good reason, then, to give me an exclusive right over my personal and real property. If it did not, I would have little reason to work to produce it. Or if I did work to produce it, I would then spend a great deal of my time trying to keep you away. It is better for everyone, the argument goes, if I have an exclusive right to my (rightly acquired) property, because then I have an incentive to produce it and not waste all my time trying to defend it.

> Things are different with intellectual property. If you "take" my idea, I still have it. If I tell you an idea, you have not deprived me of it. An unavoidable feature of intellectual property is that its consumption, as the economists like to put it, is "non-rivalrous." Your consumption does not lessen mine (Lessig, p. 131).

The special qualities of intellectual property, Lessig goes on to argue, are what warrants treating it differently from physical property. Thus, when Lessig argues that intellectual property should be less strictly protected in favor of nurturing and informational commons, his arguments should
be understood to apply solely to intellectual property, they are not, in Lessig's understanding, to be expanded to apply to property in general.

Yochai Benkler, at the opening of his *Wealth of Networks*, draws similar limits around the scope of his theory of "social production." In the industrial age, he writes, societies were forced to make difficult choices between different priorities because of the hard limits of physical property. The different qualities of information and the information-based economy are what may allow some of these limits to be surpassed.

Predictions of how well we will be able to feed ourselves are always an important consideration in thinking about whether, for example, to democratize wheat production or make it more egalitarian. Efforts to push workplace democracy have also often floundered on the shoals - real or imagined - of these limits, as have many plans for redistribution in the name of social justice. Market-based, proprietary production has often seemed simply too productive to tinker with. The emergence of the networked information economy promises to expand the horizons of the feasible in political imagination (Benkler, 2006, p. 8).

Later, Benkler more concretely limits the scope of social production, writing:

There are no noncommercial automobile manufacturers. There are no volunteer steel foundries. You would never choose to have your primary source of bread depend on voluntary contributions from others. Nevertheless, scientists working at noncommercial research institutes funded by nonprofit educational institutions and government grants produce most of our basic science. Widespread cooperative networks of volunteers write the software and standards that run most
of the Internet and enable what we do with it. [...] What is it about information that explains this difference? (Benkler, 2006, p. 35).

What explains the difference, Benkler goes on to tell us, are exactly the qualities of information that Lessig identifies in his work. Benkler and Lessig, along with other theorists of peer production (Boyle, 1996) draw the same bright line around their critique of private property. The digital commons, for these thinkers, is to be for information only, physical goods should be left to the property regimes that, in their view, have served well to distribute goods and give incentives for production.

Cultural studies, on the other hand, tends to draw on its Marxist roots to make a more sweeping criticism of private property systems, both intellectual and physical. Take, for example, this passage from Negri and Hardt, where they suggest that the rupture opened up by the difficulty of regulating intellectual property might be fruitfully extended to undermine other private property regimes.

It seems to us that, in fact, today we participate in a more radical and profound communality than has ever been experienced in the history of capitalism. The fact is that we participate in a productive world made up of communication and social networks, interactive services, and common languages. Our economic and social reality is defined less by the material objects that are made and consumed than by co-produced service and relationships. Producing increasingly means constructing cooperation and communicative commonalities. The concept of private property itself, understood as the exclusive right to use a good and dispose of all wealth that derives from it, becomes increasingly
nonsensical in this new situation. There are ever fewer goods that can be possessed and used exclusively in this framework; it is the community that produces and that, while producing, is reproduced and redefined. The foundation of the classic modern conception of private property is thus to a certain extent dissolved in the postmodern mode of production.

One should object, however, that this new social condition of production has not at all weakened the juridical and political regimes of private property. The conceptual crisis of private property does not become a crisis in practice, and instead the regime of private expropriation has tended to be applied universally. This objection would be valid if not for the fact that, in the context of linguistic and cooperative production, labor and the common property tend to overlap. Private property, despite its juridical powers, cannot help becoming an ever more abstract and transcendental concept and thus ever more detached from reality (Hardt & Negri, 2001, p. 302).

This notion, that the instability of intellectual property does not simply call for information to be treated differently, but should rather lead to a destabilization of all forms of private property is echoed by many authors within the field of cultural studies (Dyer-Witheford; Ross, 2006; Terranova, 2004; Wark, 2004).

In most cases, this desire for a broader destabilization of private property relations seems to stem from cultural studies authors' understanding the relations of production engendered by private property as inherently unjust and exploitative. Ross, for example, argues that, by limiting their critique of property to intellectual property, those involved in the "copyfight" movement to
restrict the scope of copyright law ignore the possible effects of privately owned physical infrastructure on the digital commons, as well as the needs of the physical laborers that are involved in the production and maintenance of this infrastructure. He writes, "Because they are generally ill-disposed to state intervention, FLOSS [for Free, Libre and Open Source Software, yet another name given to FOSS] engineers, programmers, and their advocates have not explored ways of providing a sustainable infrastructure for the gift economy they tend to uphold. Nor have they made it a priority to speak to the interests of less-skilled workers who lie outside of their ranks" (Ross, 2006, p. 747).

Ross's critique complicates the ethics of peer production in an important way, highlighting how it may be blind to some of the ways its vision of a better society enabled by shared information resources could be limited by leaving systems of physical property intact. It is also important to point out two things which, in turn complicate Ross's critique. First is the fact that, under some circumstances, some peer production theorists have made the case for government intervention in the realm of building the physical infrastructure of the information society. For example, Yochai Benkler recently penned an editorial for the left-leaning blog Talking Points Memo in which he urges the Obama administration use government funds to subsidize the construction of greater broadband internet capacity (Benkler, 2009). Second, some who have studied the peer production phenomenon have made the case that those involved in the peer production movement may limit the scope of their political arguments, not out of an ideological aversion to the state, but out of a pragmatic desire to build new working coalitions across old ideological boundaries. Gabriella Coleman writes that her study of the Debian Linux community suggests that, "Most hackers, however, recognize that since each developer has
personal opinions about politics, it behooves them not to attribute a universal political message to their work as this may lead to unnecessary project strife and interfere with the task at hand: the production of superior software" (Coleman, 2005, p. 8).

Rather than simply condemning or embracing peer production's limited critique of private property, this dissertation will attempt to better understand the reasons why peer production theorists and practitioners have chosen to bound their critique the way they have. This dissertation will investigate the historical roots of peer production's complex understanding of both physical and intellectual property, and propose some possible reasons why the FOSS movement, in particular, constructed the particular understanding of the proper roles of physical and intellectual property that it did. I will then go on to demonstrate how this limited critique of private property has affected the Wikipedia project's evolution.

**Cultural Studies, Peer Production and the Regulatory Abilities of Non-State Entities**

A second point of contact between peer production and cultural studies is their shared concern with the ability of entities other than the state to exercise power. Both have noted the growing importance of non-state regulatory action in our contemporary moment. However, the growing role of non-state regulation has been interpreted differently by wide range of authors from both the cultural studies and peer production traditions. This section will explore the notion of non-state power as separately developed by Lawrence Lessig and Michel Foucault, and demonstrate how Siva Vaidhyanathan and Alex Galloway suggest very different implications for the move from state to non-state regulation in the internet spaces that enable peer production. Finally, it will explain how this dissertation will seek to build on these theoretical resources.

In *Code and Other Laws of Cyberspace*, Lawrence Lessig, in the process of discussing
the impact of the internet on copyright law and copyright law on the internet, lays out what could
be called a general model of power that he believes is especially useful in understanding how
power functions in cyberspace. Lessig begins with the concept of liberty, as articulated by liberal
philosopher John Stuart Mill, and then suggests that current “libertarian” thinking has distorted
Mill's thought by being too concerned with “reducing government's power.” According to Lessig,
this overlooks the fact that Mill's was not exclusively concerned with government as a threat to
liberty. “[Mill] was a defender of liberty and an opponent of forces that suppressed it. But those
forces were not confined to government”(Lessig, p. 85). Lessig attempts to recapture what he
sees as the spirit of Mill's ideas of liberty by building a model that describes, “the various forces
that might regulate [an individual]”(Lessig, p. 86). His model includes four broad categories of
these forces. In addition to direct regulation by government Lessig includes: social pressures or
“norms,” the economic forces of the “market,” and the forces arising from the qualities of
various technologies, what he calls “architecture.” Lessig uses the example of the behavior of
smoking to demonstrate these four forces. In addition to laws banning smoking, social
stigmatization of smokers, the price of tobacco and cigarettes, and the addictive, noxious, and
hazardous quality of cigarettes themselves all put certain restrictions on the freedom of smokers
to engage in their habit(Lessig, pp. 86-90). Lessig is particularly interested in using this model of
regulation in the context of the internet because he believes that the design of technology – such
as the software “code” that enables the internet itself to function – is particularly capable of
exercising regulatory force – that is to say, power – on social relationships that take place using
the technologically mediated channels of the internet. Thus, to understand the internet and the
cultural practices that it enables, Lessig believes we must understand the regulatory power of
technology, especially software code. He expresses this belief as an often quoted axiom, “on the internet, code is law.”

In some ways, this concept of “regulation” as a force exceeding government authority already has some points in common with the post-structuralist concept of “micropower” as articulated by Foucault. One of the mutations of power at the dawn of the modern era, Foucault tells us in Discipline and Punish, is that, “the power of judging has been transferred, in part, to other authorities than the judges of the offense” (Foucault, 1995, p. 22). In another example, Foucault pointed out that the physical configuration of the built environment could affect the way power relations in that environment. In an interview with Paul Rabinow anthologized under the title “Space, Power and Knowledge,” he discusses a building which was designed in such a way that “no one could enter or leave the place without being seen by everyone – an aspect of the architecture that could be totally oppressive” (Foucault, 1993, p. 136). Foucault notes that this oppressive aspect manifests itself despite the fact the designers hoped their architecture would encourage liberty and autonomy. Both Lessig’s concept of regulation and Foucault’s concept of micropower ask us to understand power as being broadly distributed, both public and private, and acting not only through the auspices of the state but also through the seemingly more innocent contours of our social relationships and technologies. These broader concepts of power are important to have as we attempt to chart power and subjectivity in cyberspace, where government power can often seem (at least for privileged, first world ‘net users) distant.

An important concept for understanding the ways in which decentralized, non-state actors exercise power within the Internet spaces of peer production is the concept of "protocol." Siva Vaidhyanathan defines a protocol as “a way for different actors to agree on rules of engagement,
habits, traditions, or guidelines. If one or the other actor breaks or ignores the protocol, the communicative act fails. If one actor abrogates the terms of a protocol, it will lose the trust of the others. Protocols should be simple enough to allow a diverse array of actors to work over them. They should be flexible enough to allow a variety of interactions over a network or through a system” (Vaidhyanathan, 2004, p. 33). Peer-to-peer communication systems (and the collaborative peer production systems that utilize them) are – in Vaidhynathan’s understanding – based on protocols in that they will allow any user to transmit any content to any other user, so long as those users (and their associated devices) all conform to some basic, publicly known software standards. All users are equally required to conform to these standards, and the standards are – in and of themselves – indiscriminate with regards to who uses the system, and what they transmit over it. Vaidhyanathan contrasts protocols to “controls,” which “are coercive measures imposed by one actor on another”(Vaidhyanathan, 2004, p. 33).

For Vaidhyanathan, this protocol-based form of organization eases overt control and allows diversity to flourish. One example he gives is the polyphonic nature of the cultural content available via peer-to-peer file sharing networks (such as the infamous Napster) which offer up “speeches by Malcolm X, reggae remixes of hits by Biggie Smalls, various club dance mixes of Queen’s “Bohemian Rhapsody,” and long lost Richard Pryor comedy bits [...] Tamil film song, Carnatic classical music, and pop stuff from Asian Dub Foundation”(Vaidhyanathan, 2004, p. 104). Furthermore, Vaidhyanathan points out, these cultural texts are not just available for consumption, but also for use as the basis of new, hybrid forms of creativity. “The most entertaining phenomena of the MP3 libraries on peer-to-peer systems is the availability of ‘mashes’ – new compositions created by combining the rhythm tracks of one song and the vocal
track of another” (Vaidhyanathan, 2004, p. 104). This hybrid space, in Vaidhyanathan’s understanding, is made possible by the fact that peer-to-peer networks are governed by protocols that give a wide diversity of agents the freedom to act.

The work of Alex Galloway can help us to consider other, less hopeful aspects of how protocols organize peer production. While Vaidhyanathan portrays “control” and “protocol” as opposites, Galloway draws on Foucault – and later Foucauldian scholars – to understand protocols as a particular form of control. Vaidhyanathan uses the handshake as a metaphor for protocol, a neutral signal of agreement between two parties interested in communication. In contrast, Galloway compares protocol to a set of speed bumps. “Bumps [...] create a physical system of organization. They materially force the driver to acquiesce. Driving slower becomes advantageous. With bumps, the driver wants to drive more slowly” (Galloway, 2004, p. 241). For Galloway, the mechanical protocols embedded in our computers and other communications machineries may not subject us to the whims of centralized power, but they do still serve to regulate and shape our behavior.

The primary behavior shaped by protocols within the collaborative peer production spaces of interest to this dissertation is communication. One way protocol shapes our communicative behavior, in Galloway’s understanding, is by rendering it into a universalizing machine language. “A goal of protocol is totality. It must accept everything, no matter what the source, sender, or destination. It consumes diversity, aiming instead for university” (Galloway, 2004, p. 243). It is important to note that Galloway does not believe this universalizing move affects the actual content of the communications, “protocol does little to transcode the meaning of semantic units of value that pass in and out of its purview” (Galloway, 2004, p. 243). Instead,
the sameness created by these protocols occurs on the technological level. To understand what this means, we could use the McDonald’s corporation as a metaphor. McDonald's restaurants in different regions serve different sorts of food (content), adapted to local traditions, but the technological process of creating each meal remains the same.

In summary, Vaidhyanathan establishes how protocol can foster freedom and difference, and Galloway demonstrates how protocol can enable control and sameness. Both argue that computer mediated communication systems, like the systems upon which Wikipedia is built, use protocols as a primary means for organization. Protocols are therefore important pieces of how cultural norms, technological architecture, and even markets might regulate peer-production spaces, and thus important to take into consideration if we wish to reach an understanding of how decentralized non-state actors might exercise power within the peer production projects that Wikipedia typifies. In this dissertation, I will attempt to understand the specific contours of protocol within the Wikipedia project. Where both Vaidhyanathan and Galloway deal with the concept of protocol in general, theoretical terms, this dissertation will attempt to provide examples of how protocol works in practice within Wikipedia, and understand what the implications of these specific protocols might be for Wikipedia's larger cultural impact.

**Existing Wikipedia Literature**

One way the existing research provides important background for this dissertation is by establishing some basic facts about Wikipedia and its role in our contemporary culture. By establishing these basic facts, the existing literature allows me to focus on improving our understanding of the politics production responsible for Wikipedia and its potential for helping to achieve some of the emancipatory goals envisioned by the project of cultural studies. One basic
fact that existing Wikipedia research establishes is the high visibility and profound influence of Wikipedia currently enjoys, at least among residents of the developed world. This establishes Wikipedia as an important site for peer production. Furthermore, these studies demonstrate the purposes to which users put Wikipedia's information, providing important context for this dissertation.

**Wikipedia's Uses and Coverage**

A variety of studies have shown how Wikipedia is widely used for a variety of purposes by a broad cross-section of professionals, students, and others. One review of news publications found that Wikipedia had been cited in 113 news articles over the course of a 15-month period in 2003-2004 (Lih, 2004). A piece in *American Journalism Review* suggests that, despite distrust of Wikipedia on the part of some journalists, many may use the site in their background research, even if they do not explicitly cite it as a source (Shaw, 2008). Courts have also made use of Wikipedia. A 2009 article found 400 instances of Wikipedia being cited by US courts (Peoples, 2009). Student use of Wikipedia seems to be widespread. Several studies find that majorities of college undergraduates report using Wikipedia in both their academic and personal lives (Head, 2007; Head & Eisenberg, 2010; Pechacek, 2007; Schweitzer, 2008) though students often deny using Wikipedia as a direct source for assignments. Of course, given the widespread instructor concern over Wikipedia citations (Chandler-Olcott, 2009; Chandler & Gregory, 2010; Cohen, 2007) students may be under-reporting their use of Wikipedia for assignments. In one extreme case, the entire history department of Burlington College in Vermont banned students from citing Wikipedia (Cohen, 2007). However, a large number of pieces have been written by faculty, many historians, who report that they have found assigning Wikipedia editing tasks to students to be an
effective tool for teaching writing, editing, collaboration, and information-literacy skills (Caverly & Ward, 2008; Chandler-Olcott, 2009; Chandler & Gregory, 2010; Nix, 2010; Pollard, 2008; Tarasiuk, 2010). Other educators, while not citing specific experience with Wikipedia editing assignments, still make the case for teaching students to engage with and analyze, rather than avoid, Wikipedia (Maehre, 2009; McPherson, 2006; Rosenzweig, 2006; Sandars, 2009).

Outside of newsrooms, courts, and classrooms, other studies have suggested some of the uses that Wikipedia is put to by everyday people. One article documents a case in which a group of concerned internet users attempted to use the technique known as “Googlebombing” to alter the Google search results for the term “Jew,” replacing the hate site “Jew Watch” with the Wikipedia article “Jews” (Bar-Ilan, 2006). The choice of the Wikipedia article as a replacement for the hate site shows that this group of internet users found Wikipedia to be a reliable and unbiased source of information. A survey of the 100 most-visited Wikipedia articles each month from September 2006 to January 2007 gives hints as to the uses ordinary people are putting Wikipedia to in their everyday lives. The five most visited categories of articles were: entertainment, politics & history, geography, sexuality, and science (Spoerri, 2007).

Just as available studies help us to see what uses Wikipedia articles are put to, existing research also sheds some light into the subjects those articles cover. Some early critics of Wikipedia doubted that the project would be able to expand their article selection beyond, “topics that interest the young and Internet-savvy” (Denning, Horning, Parnas, & Weinstein, 2005). Jimmy Wales himself, speaking at the 2006 Wikimania conference, admitted that Wikipedia may have inconsistent coverage, which he credited to the project’s “geek culture” heritage (Wales qtd. in Halavais & Lackaff, 2008). Wikipedia's sheer size (the English Wikipedia
currently contains over three million articles) makes establishing the taxonomy of Wikipedia articles surprisingly difficult. Some small studies have reviewed coverage of one topic area, such as a 2008 article that found Wikipedia's coverage of psychology-related topics to be extensive (Schweitzer, 2008). Perhaps the best existing study of Wikipedia's coverage utilized two quantitative methods. The researchers first classified a sample of Wikipedia articles by library of congress category and then compared the resulting distribution of articles to the distribution of books in print. They found that Wikipedia has disproportionately high numbers of articles on such topics as naval sciences, geography, and military history, and relatively low numbers of articles on topics such as medicine and the law. The authors also searched Wikipedia for the titles of articles in traditional encyclopedias. They found that 18% of articles on physics topics in the print encyclopedias had no matching Wikipedia article, whereas 37% of the poetry articles lacked Wikipedia counterparts (Halavais & Lackaff, 2008). This suggests that Wikipedia's topical coverage is on the whole quite good, though it remains skewed. Coverage has probably improved since the data used in the Halavais & Lackaff study was collected in 2006.

**Wikipedia's Accuracy**

Another important background fact provided by existing Wikipedia research is the quality of Wikipedia's articles. Clearly Wikipedia's production methods are only valuable if they can, in fact, produce high-quality information. If Wikipedia is gibberish, its methods are of no use to anyone! Concern with Wikipedia's accuracy has come from a variety of sources. After leaving the project, Wikipedia co-founder Larry Sanger, in a piece on the popular technology website Kuro5hin, wrote that Wikipedia's “bias” against experts would inevitably undermine the project's ability to produce accurate information (Sanger, 2004). Members of the ACM (Association for
Computing Machinery) Committee on Computers and Public Policy used a brief piece in the December 2005 *Communications of the ACM* to express several concerns about Wikipedia's quality, including the potential for inaccurate information in articles and authorship by non-experts. They close by declaring that Wikipedia, “cannot attain the status of a true encyclopedia without more formal content-inclusion and expert review procedures” (Denning et al., 2005).

Concerns were raised about the possibility of Wikipedia distributing libelous information about high-profile individuals after the article on former Robert Kennedy aide John Seigenthaler was vandalized in 2005, falsely implying that Seigenthaler was suspected of being involved in the Kennedy assassinations (Seigenthaler, 2005). In a biting 2005 blog post, former Britannica editor Robert McHenry called Wikipedia a “faith based encyclopedia,” and argued that Wikipedia relied on an irrational trust in the notion that, “some unspecified Darwinian process will assure that those writings and editings by contributors with the greatest expertise will survive” (McHenry, 2004). His unflattering assessment of the Wikipedia article on Alexander Hamilton concludes, “the article is what might be expected of a high-school student, and it would be a C paper at best.” After Burlington College in Vermont banned undergraduates from using Wikipedia, a Burlington professor of history defended the College's decision in the pages of *The Communications of the ACM*, writing “The online encyclopedia’s method of adding information risks conflating facts with popular opinion” (Waters, 2007).

However, despite these concerns, most studies investigating Wikipedia's quality find that it is similar to most comparable conventionally produced sources. One important genre of these studies has been investigations of the quantitative rate of error in Wikipedia articles. The first of these was a 2005 study published by *Nature*, which asked 42 scientists to blindly review articles
from either Britannica or Wikipedia from their respective fields. The study found that the articles selected from the two encyclopedias had the same number of “serious errors, such as misinterpretations of important concepts,” at four each. The rate of more minor mistakes, such as, “factual errors, omissions, or misleading statements,” was only slightly higher for Wikipedia, with 162 such errors found in the sampled articles to Britannica's 123. This study has been widely cited as establishing Wikipedia as a basically accurate source of information (Benkler, 2006; Chandler-Olcott, 2009; Chandler & Gregory, 2010; Cox & Students, 2007; Cross, 2006; Ehmann, Large, & Beheshti, 2008; McGrady, 2009; Mercer, 2007). Despite objections to the study’s methodology raised by Britannica (“BRITANNICA BRISTLES.,” 2006), Nature stood by its article.

A 2006 study that asked experts to review Wikipedia articles on their respective specialties found that 13% of the articles contained errors, but also found that the experts generally found the Wikipedia material to be quite credible (Chesney, 2006). Smaller studies, in which a small set of Wikipedia articles were reviewed for errors by a single author, have tended to reinforce the Nature results. One study of the “seven top Western philosophers” found that the articles made, “no outright errors, though there were significant omissions” (Bragues, 2007). Another found four factual errors in 25 history articles, but notes that upon reviewing 10 Encarta articles giving figures Wikipedia got wrong three mistakes were found (Rosenzweig, 2006). A cartographer found that the Wikipedia article on map projection “is a very reliable source of information about the subject,” despite two small errors (Frančula, 2009). A related study using a different methodology took cited sources as a proxy for quality, assuming that high-quality sources would lead to high-quality content. It found that Wikipedia articles and scientific
journals tended to cite similar sources, and concluded this indicated Wikipedia was producing accurate information (Nielsen, 2007).

A dissenting view is provided by an article in The Scientific Review of Mental Health Practices, which reviewed the quality of four Wikipedia articles on psychiatric disorders. Despite writing approvingly of the articles on autism and bipolar disorder, the author concludes that “a higher quality of work would be desirable in a source so easily accessible to concerned members of the public,” apparently on the basis of “problematic statements” included in articles documenting the less well-known reactive-attachment disorder and the associated field of attachment theory (Mercer, 2007). Despite the disappointment of the Scientific Review of Mental Health Practices author, their findings are consistent with the conclusion that Wikipedia's production practices are capable of producing high-quality information, even if they do not do so completely consistently. The same could be said of conventional methods of information production, as can be seen in the comparable rate of errors found in traditional encyclopedias.

Another genre of investigation into Wikipedia's quality has tested the mechanism the site uses to find and correct errors. In a 2003 article for First Monday, Andrea Cliffoli argues that one of the reasons for Wikipedia's success is its simple method for error correction. She writes, “Wiki technology reduces the transaction cost of erasing graffiti and therefore prevents attackers from posting unwanted contributions” (Ciffolilli, 2003). The efficacy of Wikipedia's corrective mechanisms have been extensively tested, and generally found to be quite good. One study, which used automated methods to investigate the entire Wikipedia data dump, found that one easily-recognizable form of vandalism, the replacement of large amounts of article content with the word “fuck,” was usually corrected in less than two minutes (Viegas, Wattenberg, & Dave,
Another automated quantitative study of the Wikipedia database found that edits specifically marked as being reverted due to vandalism tended to persist on the site for quite a short time, having a mean survival time of 2.1 days and a median of 11.3 minutes (Kittur, Suh, Pendleton, & Chi, 2007).

Other experiments have tested the ability of Wikipedia editors to detect and remove more subtle errors. In one such trial, Alex Halavais intentionally introduced 13 small errors into Wikipedia, before posting to his blog that he expected the errors to remain for some weeks (Halavais, 2004). In fact, all of the errors were removed in the space of a few hours. His experiment was carried out in an informal way, but his results attracted attention from alternative culture blog BoingBoing (“Wikipedia proves its amazing self-healing powers,” 2005) and The Chronicle of Higher Education (Read, 2006). However, Halavais' technique provided Wikipedia editors with clues that may have allowed them to more easily fix the mistakes he introduced. He made his edits consecutively over the course of just a few hours, and made them all from a single user account. This pattern of activity alerted Wikipedia editors to the possible presence of a serial vandal once his first falsehood was discovered. Comments left on the talk page of the user account Halavais employed to make his edits suggest that Wikipedians reverted the account's edits en masse once a vandal was suspected (“User contributions for AlHalawi - Wikipedia, the free encyclopedia,” n.d.).

A later repeat of the same experiment by another user used a more sophisticated technique, inserting errors one at a time, over the course of several days. This experimenter was able to insert five errors into Wikipedia, none of which were deleted until they removed them at the end of the experiment. The longest an error persisted on the site was five days (“How
Authoritative is Wikipedia,” 2004). A study based on a more formal, rigorous version of this same experiment was published in *First Monday* in 2008. The author inserted small inaccuracies, which he dubbed “fibs,” into Wikipedia three at a time, using different IP addresses for each insertion. He found that around half of the fibs were removed by editors within 48 hours of their insertion (Magnus, 2008). This suggests that Wikipedia’s correction mechanisms are robust, if not perfect, over the short term. Another study suggests that Wikipedia’s ability to correct small errors over the long term is even more robust. An exhaustive hand search of all of the edits made to the 100 Wikipedia articles describing the sitting members of the U.S. Senate discovered some 700 attempts at vandalism. The authors found that the median survival time for these damaging edits was 6 minutes and the mean was 24 hours (Kohs, 2008). Ironically, this study was carried out by the website MyWikiBiz, which is critical of Wikipedia, and uses this information to argue that Wikipedia’s error correction mechanism is quite flawed. After presenting their data, the authors write that the short survival times are not what matters, rather what is important is, “that the Wikimedia Foundation allows anonymous editors to append the article about Hillary Clinton with ‘hillary needs to die and chop of her penis.’” The numbers reported, however, seem to indicate that such vandalism is quickly reverted. Overall, available studies suggest that Wikipedia’s error correction mechanism works well.

**Wikipedia and Search**

Wikipedia's relationship with search engines is one area of direct interest to this study where existing research provides important findings. This research establishes that search plays an important role in driving traffic to Wikipedia, and shaping what Wikipedia content is seen and edited. Nielsen net ratings attributes the massive growth of Wikipedia traffic in the period 2003-
2008 to referrals from search engines, especially Google (Wikipedia U.S. Web Traffic Grows 8,000 Percent, 2008). One study shows that almost all popular pages on Wikipedia rank highly in search results. The author writes, “For Google, 96 percent of the popular Wikipedia pages are in the top seven positions [of the list of search results]; for Yahoo and MSN, it is 93 and 91 percent, respectively” (Spoerri, 2007). Another, smaller survey found that Wikipedia articles on psychology-related topics were “prominently displayed” by major search engines (Schweitzer, 2008). Clearly, given the important role that search engines play in driving, and perhaps shaping, the internet traffic coming to Wikipedia, traffic that represents not only readers but also potential editors, the qualitative influence of search in the Wikipedia editing community needs to be better understood.

Wikipedia Demographics

Along with establishing basic facts about Wikipedia's content and relationship with search engines, existing research also provides useful context for this dissertation by establishing some quantitative data about the Wikipedia community. This quantitative data provides important context for the generally qualitative methods employed in this dissertation. One such piece of context is the demographic profile of the Wikipedia community. Unfortunately, while one of Wikipedia's most attractive features is the notion that “anyone can edit,” the available data suggests that the population of people that actually does edit Wikipedia is skewed towards historically populations: especially males, educated people, and residents of the developed world. Most demographic data on the Wikipedia editing community to date has been collected incidentally, in the process of collecting surveys on other questions. One such study found that 92.7% of 151 surveys returned were from males (Nov, 2007). A survey of 106 members of the
German Wikipedia had 88% report as male, and 10% as female (Schroer & Hertel, 2007).

Preliminary data from a joint survey of Wikipedia users performed by the Wikimedia foundation and UNU-MERIT seems to support these results (Glott, Schmidt, & Ghosh, 2009), though the authors caution that they are still analyzing this data. A comparative study of different language Wikipedia projects found that residents of developing countries tended to be under-represented in the Wikipedia editing community, even when they had the technical means necessary to contribute (Rask, 2008).

**Growth and Sustainability of Wikipedia**

Along with establishing the basic makeup of the Wikipedia editing community, there has also been a scholarly interesting in tracking how the size and activity level of this community has changed over time. This is important because it establishes whether or not the Wikipedia project, and perhaps the peer production method more generally, is sustainable over time. Several important questions have been raised about the long term viability of the Wikipedia project. One study suggested that Wikipedia may founder as editors devote more of their labor on the site to maintaining content, and less on creating new articles (Kittur et al., 2007). Another argued that Wikipedia would soon fall short of labor due to insufficient incentives to contribute (Goldman, 2009). In 2009, the *Wall Street Journal* reported that Wikipedia editors were “leaving the site in droves” (Angwin & Fowler, 2009) on the basis of figure's drawn from Felipe Ortega's doctoral thesis “Wikipedia: A Quantitative Analysis” (Ortega, 2009), which appeared to show a sharp increase in editors leaving the site near the end of 2009. However, these concerns about Wikipedia's sustainability do not appear to hold up. Goldman's critique of Wikipedia's labor supply model seems to be based on assumptions more than data, and as the research cited below
demonstrates, Wikipedia contributors give a wide variety of motivations for contributing to the site. Wikipedia ethnographer Joe Reagle points out that the tension between recruiting labor and preventing disruption that Goldman's piece notes has, in fact, always been a feature of the Wikipedia community (Reagle, 2009). There is no reason to believe this tension will now cause Wikipedia to implode. The Wall Street Journal reporting was contested both by Wikimedia foundation analysts, who showed that the apparent increase in editors leaving the site near the end of Dr. Ortega's data was a likely artifact of the statistical method he was employing, and could be replicated with data from other time periods, and by Ortega himself, who complained that his data had been taken out of context (“Ortega: Wikipedia’s self-regulating patterns in open numbers | Wikipedia, Critical Point of View,” n.d.). Both pointed out that the available data show that Wikipedia editor numbers and editing activity has been stable since about 2007. Wikipedia continues to add articles, though at a slower rate than it did during its most rapidly expansionist period (Moeller & Zachte, 2009). All of this data seems to be consistent with a picture of the English Wikipedia settling in to a stable period, after the rapid growth of its earlier expansionary period has ended. This would seem to make sense for an encyclopedia that currently contains more than 3 million articles! In such a period, we should not be surprised to see that the labor of editors shifts toward maintenance and away from new article creation, just as Kittur observes. Taken as a whole, I believe that the current data suggest that Wikipedia’s productive methods are sustainable.

**Motivation of Wikipedia Contributors**

As mentioned above, one important concern about Wikipedia’s sustainability has hinged around the question of motivation for Wikipedia contributors. The question, “what motivates
Wikipedia contributors,” has been quite well-studied, mostly because the presence of a community engaged in a difficult task like encyclopedia production provides an obvious paradox for classical capitalist understandings of political economy. This is especially true since Wikipedia is even less reliant on wage labor than other popular sites of peer production, like FOSS. Early research tended to posit that Wikipedians were mostly likely motivated by gains to “reputation” (Ciffolilli, 2003). Indeed, studies do show that Wikipedians accumulate “credit” within the community through the editing process (Forte & Bruckman, 2008a). However, Forte and Bruckman stress that not all Wikipedians find this process desirable, “Aside from confusion about how it is appropriate to make a name for oneself, there is controversy over whether one should make a name for oneself. Many members of the Wikipedia community subscribe to a populist, egalitarian view of knowledge production.” Other recent studies have suggested that a suite of intrinsic motivations are the main reason editors work on Wikipedia (Okoli & Oh, 2007). Indeed, while Wikipedia has often considered building a formal method for tracking community reputation into their software, such a system has never been implemented (Masum & Zhang, 2004). One survey found that “fun and ideology” top reasons for contributing (Nov, 2007), another reports that half of Wikipedians surveyed were motivated by a desire to “educate humanity/raise awareness,” with 17.78 percent giving “feel like I’m making a difference” and 15.56 giving “to give back to the Wikipedia community” as motivations (Kuznetsov, 2006). This research establishes that a combination of accumulating community status, altruism, and pleasure motivate most Wikipedia contributors. This study will attempt to more closely investigate the implications of this motivation system.

Wikipedia Community Governance: Power and Conflict Resolution
Existing research into the Wikipedia community goes beyond simply investigating the motivations of Wikipedia contributors, it also lays the groundwork for understanding the governance mechanisms at work in Wikipedia. Much like the curiosity about the motivations of Wikipedia contributors, much of the interest in understanding Wikipedia's methods of conflict resolution and governance stems from the perception that Wikipedia has somehow miraculously escaped from the usual laws governing capitalist production. This perceived radical break with prior productive methods has made Wikipedia governance a source of both excitement and concern. Benkler's *Wealth of Networks*, which I have already discussed, is a good example of the excitement about Wikipedia, but it was not the first publication to forward the notion that Wikipedia represented a working model of a new and potentially liberating form of political economy. At least two earlier pieces (Stalder, 2008; Weiss, 2005) make this argument. Like Benkler, these authors make the case that Wikipedia represents the application of the “open source” production methods developed by FOSS outside the software realm, and that these methods represent a radically egalitarian, flexible, and efficient method for producing information. However, not everyone thought Wikipedia represented a change for the better. Most famously, Jaron Lanier’s “Digital Maoism,” criticized Wikipedia's communal decision making process as a new form of destructive “groupthink” (Lanier, 2006).

Just as the motivation of Wikipedia contributors has proved to be more complex than the simple “reputation” model that early observers tended to assume, so too research has shown Wikipedia's governance to be more complex than its early advocates and critics believed. Several studies have shown that, despite Wikipedia's open technical structure, which allows “anyone” to edit, the site has evolved social practices with serve to regulate editing activity. A
comparative study of Wikipedia and the political website Daily Kos found that Wikipedia used
social norms to moderate the ability of minority points of view to add their stance to a
discussion, or to veto a widely held position (Farrell & Schwartzberg, 2008). Another study
(Viegas, Wattenberg, & McKeon, 2007) finds that Wikipedia abides by the principles of self-
governance described by Elinor Ostrom in her work on commons-based agricultural
communities (Ostrom, 1990). The authors conclude, “that rather than encouraging anarchy, many
aspects of wiki technology lend themselves to the collective creation of formalized process and
policy.” Maintaining these social norms requires policing the boundaries of the Wikipedia
community. A review of 250 Wikipedia arbitration cases found that arbitration does not actually
serve to “to resolve disputes and make peace between conflicting users.” Rather the process
excludes disruptive users and invites good editors to participate more in the site (Hoffman &
Mehra, 2009).

Most research suggests that these norms lead to a decentralization of power on Wikipedia,
though the exact form of this power, and its implications, remain hotly debated. A study of the
evolution of Wikipedia’s important Verifiability Policy concluded that the site had avoided the
emergence of an oligarchy on the basis of the fact that administrators and other members of
privileged groups did not have a significantly higher likelihood of having their edits to this
policy go undisputed or survive disputes (Konieczny, 2009). Another study, based on an
extensive set of interviews with Wikipedians, finds that governance has slowly become more and
more decentralized on Wikipedia as the project has evolved (Forte & Bruckman, 2008b). In the
account Forte and Bruckman give, power on Wikipedia has been distributed into more and more
hands, first from Wales to the arbitration committee and then to administrators, as a natural
consequence of the increased burden of decision making as the community has grown larger. They give the example of William Connolley, a respected climate scientist who was sanctioned by the arbitration committee for breaking editing rules in a debate with global warming denialists. According to Forte and Bruckman, in many cases sympathetic administrators refused to enforce the sanctions against Connolley, effectively negating the concentrated power of the arbitrators.

However, while governance on Wikipedia appears to be decentralized as far as the whole project is concerned, studies have found evidence that individual articles, or groups of articles, may tend to fall under the sway of small numbers of dedicated editors. While their study cited above describes power decentralized power on Wikipedia, Forte and Bruckman found that editors and editor factions may attempt to exercise informal forms of article “ownership,” despite Wikipedia policies that explicitly ban them from doing so (Forte & Bruckman, 2008a). One semi-automated quantitative investigation of the Wikipedia database found that clusters of users with a shared point of view can be identified by their common reverts of other, opposing editors (Kittur et al., 2007). Farrell and Schwartzberg also find that small groups of users tend to dominate articles (Farrell & Schwartzberg, 2008). In addition to factionalism, another potential flaw for Wikipedia's governance is its ad-hoc nature. One study found that ambiguities in Wikipedia policies can be exploited by editors who wish to impose their wills on others (Kriplean, Beschastnikh, McDonald, & Golder, 2007). Another argues that ad-hoc dispute resolution systems were exploited by the deletionist faction\(^3\) to inappropriately alter Wikipedia policy (Kostakis, 2010).

\(^3\) A major faultline in the Wikipedia community has been the division between “deletionists” who want to strictly limit Wikipedia's content, and “inclusionists” who want to allow a greater diversity of content on Wikipedia.
The Cultural Studies Gap

These studies provide important information about the nature of power on Wikipedia, but they also demonstrate the need for a cultural-studies informed approach to the site. For the most part, these studies engage power in a binary way. Either they attempt to establish that power is concentrated in elite hands, or they attempt to establish that it is distributed broadly. Distributed power is dealt with either as liberating or threatening depending on the author. However, this study will follow Galloway's observation, discussed above, that distributed power is neither liberating nor destructive simply by its presence. Instead, I will attempt to understand the specific implications of Wikipedia's form of governance. In particular, I am interested in how Wikipedia's governance is articulated with other elements, both inside Wikipedia itself and beyond it.

Existing humanities approaches to Wikipedia have taken some of these concerns into account. In a 2008 piece in Leisure Studies Journal, James J. Brown argues that Wikipedia is an example of how what Himanen called the “Hacker Ethic” is reshaping the boundaries of work and play. He suggests “Wikipedians are less concerned with being credited with ‘property’ than they are with contributing to an ongoing conversation.” This piece is an interesting integration of Wikipedia into labor studies, and thus into political economy more broadly, but its understanding of Wikipedia is very broad. It cites no primary sources from the site (Brown, 2008). The form of labor that Wikipedians are engaged in, and the consequences of their labor, needs to be explored in detail.

In a 2009 piece, Christian Pentzold draws from Pierre Nora's idea of the “memory place,” a shared site of communal construction of the past, to argue that the online encyclopaedia is a global memory place where locally disconnected participants can express and debate divergent
points of view and that this leads to the formation and ratification of shared knowledge that constitutes collective memory” (Pentzold, 2009, p. 263). Pentzold notes that, in the case of the Wikipedia article on the July 2005 London subway bombings, there were extensive debates over the use of the words “terrorist” and “terrorism,” which he interprets as the community negotiating how the event would be remembered. This is an important insight, but ultimately this article raises more questions than it answers. What forces shape the shared remembering that happens on Wikipedia? In this case, the proponents of the use of the word “terrorism” won the debate. Why should this be so, and what impact does this have on the much larger community that reads, rather than writes, Wikipedia as a means of remembering?

A piece building off of Pentzold’s work encounters many of the same problems. Haider and Sundin attempt to explain Wikipedia’s place in the contemporary system of knowledge using Foucault’s notion of the heterotopia. They ultimately argue that “while a cynical interpretation of Wikipedia’s reliance on other texts and outside sources, could be called ‘source positivism’, or be described as a late modern strategy in which text is everything, seeing it as a digital heterotopia allows us to offer a more positive interpretation.” This is an important argument, as it does allow us to leave behind a certain theory-based pessimism that dismisses Wikipedia as merely a reproduction of discredited modern ideas. However, the authors show only a very surface understanding of Wikipedia itself. They fail to understand how Wikipedia does not simply connect “everything to everything else.” In fact, the specifics of the Wikipedia production process must be better understood in order to understand the specific qualities of the Wikipedia heterotopia. Foucault himself insisted that heterotopias are always historical and specific.

Chapter Breakdown
Thus, we can see the gap that I hope my dissertation will fill. Existing studies, while providing important quantitative and qualitative background information about Wikipedia, fail to address the important questions about the peer production method raised by the cultural studies authors reviewed above. In this study, I hope to take seriously both the call that arises from cultural studies to take power as more than a simple binary, while simultaneously taking seriously the specific history and practices of Wikipedia itself. Each of the chapters in this dissertation has a distinct roll to play in this larger project. The second chapter, Theories and Methods, explains how I draw from Bruno Latour and N. Katherine Hayles to provide a theoretical framework for my investigation. In particular I explore Hayles' notions of “body” and “embodiment.” Chapter Two then goes on to explain the methods employed in my qualitative study of Wikipedia. Chapter Three, Embodying FOSS, demonstrates how the anxieties and desires of the embodiment experienced by FOSS hackers would be resolved in through an ideal body I call the “cyborg individual.” The cyborg individual, paradoxically, calls for software and other information to become non-property as a means to preserve the property rights of individual owners of computer hardware. Chapter Four, Wikipedia's Changing Embodiment, explores how the ideal of the cyborg individual has influenced Wikipedia, and how Wikipedia's technological embodiment has diverged from this ideal. Most importantly, Chapter Four establishes how Wikipedia's collective nature has been concealed by the ideals of the cyborg individual. I will argue that, in fact, much of Wikipedia's success is due to its ability to share resources and recruit and manage collective labor. Chapter Five, Wikipedia and Google explores the links between Wikipedia and the Google search engine, an important link between the shared resources of Wikipedia and its community and another large element of technological
infrastructure. Finally, Chapter Six, Wikipedia and the Gaza War explores how the Wikipedia community resolved disputes and made decisions about the allocation of shared resources in the case of the politically fraught article documenting the 2008-2009 war in the Gaza Strip.
CHAPTER TWO – THEORIES AND METHODS

In the previous chapter, I made the case for why cultural studies and Peer production “need each other.” My investigation of Wikipedia is informed and shaped by this insight. In this chapter I will present the specific theoretical frame and methods I will employ in my study of Wikipedia. Two authors are key to my theoretical frame. Bruno Latour’s Actor-Network sociology broadly informs my understanding of Wikipedia. In particular, I draw from Latour's understanding of agency, his model of social relationships, and his understanding of what it means to say that facts are “constructed.” In addition, my methods attempt to follow Latour’s admonishment to ”follow the actors” involved in a given social assemblage if one wishes to understand that assemblage. In many ways, my broad borrowing from Latour is the glue that holds the somewhat disparate parts of this dissertation together. The second author I discuss below, N. Katherine Hayles, provides a more direct scaffolding for my work. Hayles' related concepts of “body” and “embodiment” can be usefully expanded to form a concrete basis for examining how the various human and non-human actors (to use Latour's terms) that make up Wikipedia interact.

Reading Networks of Associations: Bruno Latour and ANT

Bruno Latour calls the body of sociological theory he has developed “Actor-Network Theory.” (ANT) Latour has described one of the aims of ANT as, “a deliberate attempt to terminate the use of the word 'social' in social theory and to replace it with the word 'association’” (Latour, 2002, p. 117). This is because, in Latour's view, the word “social” has become laden with meanings that tend to frustrate, rather than aide, our attempts to explore and understand the world. He writes:
[...] when social scientists add the adjective 'social' to some phenomenon, they designate a stabilized state of affairs, a bundle of ties that, later, may be mobilized to account for some other phenomenon. There is nothing wrong with this use of the word as long as it designates what is already assembled together, without making any superfluous assumptions about the nature of what is assembled. Problems arise, however, when 'social' begins to mean a type of material, as if the adjective was roughly comparable to other terms like 'wooden', 'steely', 'biological', 'economical', 'mental', 'organizational', or 'linguistic'. At that point the meaning of the word breaks down since it now designates two entirely different things: first, a movement during a process of assembling; and second, a specific type of ingredient that is supposed to differ from other materials (Latour, 2005, p. 1).

It is this second meaning of “social,” the notion that it designates a particular sort of “ingredient” (what Latour calls elsewhere, “social stuff”) that can function as a readily identified component in human cultures that Latour objects to.

When this “social stuff” is presumed to be at work, Latour complains, we are too often liable to decline from investigating further. Latour writes, “whenever a social explanation was provided there was something very tricky going on. Instead of establishing some connection between two entities, it often happens that one entity is substituted by another one” (Latour, 2005, p. 100). The social comes to substitute for things, Latour complains, rather than explain them. Religious beliefs, systems of power, even scientific practices are all emptied of their
specific content, and of the internal logic professed by their practitioners, and attributed to vague “social forces,” acting unseen to shape all of reality. It is to this sort of thinking that Latour most vigorously objects.

To avoid this pitfall, Latour advises that we instead concentrate on associations. That is to say, on the ways in which various human and non-human elements are linked together in order to form larger assemblages. This is easiest to see, Latour tells us, when new links are being formed, something he found to be a common practice in the scientific laboratories that were his early field of study. Take, for example, this account by Latour of Watson and Crick making the case for the “double helix” molecular structure of DNA. In it, Latour stresses the way that different elements must be linked together by the scientists in the course of constructing their case.

Still all the convinced [of the double-helix structure] people are in the same office and although they think they are right, they could still be deluding themselves. What will Bragg and all the other crystallographers say? What objections will Maurice Wilkins and Rosalind Franklin, the only ones with X-Ray pictures of DNA, have? Will they see the model as the only form to give, by projection, the shape visible on Rosalind’s photographs? They’d like to know fast but dread the danger of the final showdown with people who, several times already, have ruined their efforts. Besides another ally is missing to set up the trial, a humble ally for sure but necessary all the same: 'That night, however, we could not firmly establish the double helix. Until the metal bases were on hand, any model building would be too sloppy to be convincing.’ (idem: p 127) Even with Chargaff laws, with biological significance, with Donohue's excitement, with the base
pairing all on their side, the helix is still sloppy. Metal is necessary to reinforce the structure long enough to withstand the trials that the competitors/colleagues are going to impose on it (Latour, 1987, p. 12).

In this account, Latour could have portrayed “the social” as an alien intruder imposing itself on the laboratory to either pervert or to determine the facts under construction there. He could have postulated, for example, that the “social pressure” of bourgeois society’s demands for neatness and order were what dictated that Watson, Crick and their compatriots wait until metal components were available to allow them to build a tidy model. He does not do this. Instead, Latour portrays “the social” as the process of association at work within the laboratory, and as intrinsic to it as any other site of collaborative work. This understanding of “social” expands to include both human and non-human actors. In this example the associative process links together theories, instrument readings, scientific ambitions, simple metal modeling tools, and many other elements to build the double helix model of the DNA molecule.

In this sense, Latour is interested in how facts and knowledge are “constructed,” but we must be careful when understanding what he means by this. Latour is careful to distinguish his brand of constructivism himself from that of those he calls “social constructivists,” whom he believes have developed the idea in an incorrect way. To say something is “constructed,” Latour stresses, is not to say that something is not “real.” Rather he writes that, “to say something is constructed means that it’s not a mystery that has popped out of nowhere, or that it has a more humble but also more visible and interesting origin” (Latour, 2005, p. 88). Not all readers of other authors describing themselves as “social constructivists” would call Latour’s reading of this work accurate. Indeed, it is possible that Latour mischaracterizes social construction.
Nonetheless, this dissertation is committed to Latour’s complicated understanding of the term, “constructed.” That is to say, I follow Latour in wishing to embark on a process of understanding the process through which in focusing on how Wikipedia articles, like scientific facts (and for that matter, all other actors), were assembled; like him, I have no wish to “reveal” these articles (or anything else) as arbitrary effects of inscrutable “social stuff.”

ANT’s stressing of the need to study how things are constructed but still “real” is of particular use to this study. I will be treating both peer production and cultural studies as co-equal “construction sites,” in which links between different elements are being articulated. Bringing peer production and cultural studies into dialogue in this way allows me to avoid the problem, identified so clearly by Latour, of scholars ignoring or discarding the insights and language provided by the subjects of their study and instead imposing on them language of their own. This has been a pitfall for far too many “critical readings” of culture. I wish to avoid this error, not to be faithful to my own sense of just scholarship, but also because the users of the Wikimedia constellation, like the scientists studied by Latour, are capable of “biting back,” making public their disagreement with a characterization of their community and practices that they feel to be unfair.

There exists, of course, an opposite error, that of taking the testimony of one's subjects too literally and of ascribing to them perfect self-awareness and agency over their actions. Latour’s theory provides useful tools to guard against this error as well. ANT does not ascribe agency to already formed human individuals, rather, just as Foucault does, ANT points out that the individual is itself a construct, one of many social groups formed in the constant play of associations.
If you still believe groupings exist 'by themselves', for example the 'individual', just try to remember how much labor had to be done before each of you could 'take your life into your own hands.' How many admonitions from parents, teachers, bosses, partners, and colleagues before we learned that we had better be a group of our own (the ego)? (Latour, 2005, p. 32)

Furthermore, ANT holds that agency must be ascribed to all of the actors, both human and non-human, that are linked together in a given formation. For example, each of the elements in the previously related story of Watson and Crick's construction of the Double Helix model of DNA, from the most austere theory to the lowliest bit of lab equipment, ANT considers a fully-fledged actor in the story. Latour distinguishes between two terms: mediators and intermediaries to explain how this multiple model of agency functions. Conventional models of agency which posit that one element or set of elements acts, and others are acted upon, assume that most things are intermediaries, that which, “transports meaning or force without transformation: defining its inputs is enough to define its outputs.” ANT's model, on the other hand, assumes that most things are mediators, that is to say they, “transform, translate, distort, and modify the meaning or the elements they are supposed to carry”(Latour, 2005, p. 39). As a final example to clarify what this all means, Latour provides the metaphor of the puppet and the puppeteer:

Sociologists are often accused of treating actors like so many puppets manipulated by social forces. But it appears that puppeteers [...] possess pretty different ideas about what it is that makes their puppets do things. Although marionettes offer, it seems, the most extreme case of direct causality - just follow the strings - puppeteers will rarely behave as having total control over their puppets. They say
queer things like 'their marionettes suggest them to do things they will have never thought possible by themselves.' When a force manipulates another, in does not mean that it is a cause generating effects; it can also be an occasion for other things to start acting (Latour, 2005, pp. 59-60).

The model of agency that Latour provides allows me to consider how both peer production and cultural studies might link to other actors and each other without either lionizing those involved as totally autonomous romantic individuals or collapsing them into transparent dupes of others. By considering these schools of theory and practices as mediators, we are able to explore how they are both modified by and modify the other elements they are articulated with. In particular, I am interested in how peer production and cultural studies are articulated with historically significant power formations, including Race, Class, Gender, Sexuality, and Nationality.\(^4\) Like Latour, I am hesitant to ascribe these forms of power and domination to ill-defined “social forces,” or to simply chart where such forces might be reproducing themselves inside the spaces of peer production. Instead I intend to follow Latour’s admonishment that those who, “wish to inherit this ancient, venerable, and fully justified intuition of the social science - power is unequally distributed - they also have to explain how domination has become so efficacious and through which unlikely means” (Latour, 2005, p. 86).

**The Embodiment of Wikipedia: N. Katherine Hayles**

In order to heed Latour’s advice and “follow the actors,” I draw from the work of N. Katherine Hayles. In following the actors behind Wikipedia, I sketch what amounts to a history of the site. My account of the history of Wikipedia, which rightly begins with the history of

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\(^4\) By using the term “articulation” here, I mean to stress that the linkages between peer production and these historically significant power formations are not one way. Peer production is both influenced by this history, and modulates these historical structures as it forms its own spaces.
FOSS, focuses on how coders and editors understood, shaped, and were in turn shaped by, the material infrastructure that they employed to develop their respective software projects and encyclopedia articles. N. Katherine Hayles' concept of “materiality,” or the “dynamic interactions between physical characteristics and signifying strategies,” (Hayles, 2005, p. 3) helps to establish why this relationship between the human creators of digital information (in the cases of both software and Wikipedia) and the physical platforms that give that information form is an especially significant one. By focusing on materiality, I focus my history on the important role that the physical form information plays in the FOSS\(^5\) and Wikipedia communities, without assuming that this form completely determines the actions of members of these communities. Indeed, the major drives of Hayles' *How We Became Posthuman* are that we cannot meaningfully separate “information” from its physical form, and that the emergence of the idea of “information” as something abstract, immaterial, and disembodied over the course of the second half of the twentieth century has served to distort our understanding of culture by strengthening the Cartesian privileging of mind over body. Hayles charts the rise of this ideology of disembodied information in *How we Became Posthuman*, and in this book she argues forcefully against what she calls the “posthuman” stance that human consciousness and subjectivity are patterns of information that can be separated from the human bodies they have historically called home. She relates her horror at roboticist Hans Moravec's famous thought experiment, in which he imagines the “downloading” of a human mind into a computer. “How” she writes, “was it possible for someone of Moravec's obvious intelligence to believe that mind could be separated from body? Even assuming that such a separation was possible, how could anyone think that

\(^5\) Free and Open Source Software, a method of software production that established many of the peer production techniques Wikipedia would later build on
consciousness in an entirely different medium would remain unchanged, as if it had no connection with embodiment?” (Hayles, 1999, p. 1) In her later *My Mother Was a Computer*, Hayles explains that her opposition to this vision of the posthuman as rooted in her own desire to see emerge “versions of the posthuman that would acknowledge the importance of embodiment and be conducive to the enhancing human and nonhuman life on the planet” (Hayles, 2005, p. 2). Hayles’ comments here illustrate her concern that the disembodiment of information privileges abstract, symbolic power and marginalizes the everyday life of ordinary human beings.

However, Hayles acknowledges that, by the time of *My Mother Was a Computer*, this binary has been complicated considerably by the dramatic spread of “pervasive computing, mobile communication devices, satellite communications, and internet traffic” (Hayles, 2005, p. 2). This spread, she argues, lead to the evolution of “new and more sophisticated versions of the posthuman,” in which “this stark contrast between embodiment and disembodiment has fractured into more complex and varied formations” (Hayles, 2005, p. 2). This diversification of the cultural understanding of the posthuman means, “a binary view that juxtaposes disembodied information with an embodied human lifeworld is no longer sufficient to account for these complexities” (Hayles, 2005, p. 2). My reading of the history of Wikipedia suggests that it is the product of one of the “new and more sophisticated versions of the posthuman” that Hayles alludes to, specifically the understanding of information, embodiment, and the individual that developed among FOSS hackers around the turn of the 20th century. This understanding, which I will call “cyborg individualism” for reasons that should become clear later, was informed by the intersection of politics, signifying practices, and material circumstances of the FOSS community. That is to say, it was informed by this community’s materiality.
To explore how the FOSS community (and later Wikipedia) understood the complex intersection between “disembodied information” and “embodied human lifeworld,” I will employ the twin binaries that Hayles develops in *How We Became Posthuman*: Body vs. Embodiment and Incorporation vs. Inscription. I rely on these terms from Hayles’ earlier work because they provide a simple, concrete “frame” useful for organizing and making sense of the history of Wikipedia. Despite drawing off of terms from *How We Became Posthuman*, I remain committed to the more complex and nuanced understanding of the posthuman advanced in *My Mother Was a Computer*, and I have noted where I have adapted the terms accordingly.

First I will briefly review these two binaries, as they are understood by Hayles, before moving on to sketch out how I will employ them in framing my reading of the history of Wikipedia and FOSS. Like DeCerteau, who she cites approvingly, Hayles is concerned with dignity and importance of everyday life in the face of what she sees as alienating forms of abstraction. She uses “the body” to refer to the abstract, ideal form that cultures apply to actual, corporeal human beings. “Embodiment,” in contrast, defines for Hayles the entire field of individual human experiences of fleshy existence. “The body,” she writes, “is an idealized form that gestures towards a Platonic reality, embodiment is the specific instantiation generated from the noise of difference” (Hayles, 1999, p. 196). For Hayles, the disconnect between the ideal body constructed by a culture’s discourses, and the ways in which individuals experience their own embodiments has important implications. She gives the example of early twentieth century idealization of the vaginal orgasm, established in this period as a marker of the “normal” female body, “across a range of cultural sites, from Freudian psychoanalysis to the novels of D. H. Lawerence.” Women confronted with the difference between this idealized norm and their own
experience of embodiment reacted, “in a variety of ways. Some women disciplined their experiences to bring them into line with the concept; others registered their experiences as defective because they were other than the concept; still others were skeptical of the concept because it did not match their experiences.” These diverse responses show Hayles that, “because embodiment is individually articulated, there is also at least an incipient tension between it and hegemonic cultural constructs” (Hayles, 1999, p. 197). For Hayles, embodiment is important because it represents a way in which the human lifeworld is not completely determined by hegemonic power.

This is not to say, of course, that embodiment is not informed by the ways in which a culture sets out ideal norms for the body. Far from it, as the example above demonstrates. To better understand the complicated ways that body and embodiment interact, Hayles suggests we consider another binary, the signifying practices she calls inscription and incorporation. Practices of inscription are those that involve formal systems of signs, such as language. Defining inscription, Hayles writes, “like the body, inscription is normalized and abstract, in the sense that it is usually considered as a system of signs operating independently of any particular manifestation” (Hayles, 1999, p. 199). Like disembodied information, the abstract systems of inscription travel well between and among bodies. The other side of this binary, incorporation, represents practices of meaning making that are irrevocably linked to a particular and always specific embodied act. Hayles writes that,

an incorporating practice such as a good-bye wave cannot be separated from its embodied medium, for it exists as such only when it is instantiated in a particular hand making a particular kind of gesture. It is possible, of course, to abstract a
sign from the embodied gesture by representing it in a different medium, for example by drawing on a page the outline of a stylized hand, with wavy lines indicating motion. In this case, however, the gesture is no longer an incorporating practice. Rather, it has been transformed precisely into an inscription that functions as if it were independent of any particular instantiation (Hayles, 1999, pp. 198-199).

It is important to understand that Hayles does not claim that incorporation is “natural” and inscription “artificial,” instead she points out that, “the body is enculturated through both types of practices.” However, she argues that practices of incorporation may often overflow the attempts of language to describe them, “showing someone how to stand is easy, but describing in words all the nuances of the desired posture is difficult” (Hayles, 1999, p. 200). Thus, for Hayles, incorporating practices allow for the existence of a vast reservoir of human knowledge often unappreciated in our contemporary society, focused as it is on language and other forms of abstract symbolism may miss.

In my reading, Hayles' main purpose in *How We Became Posthuman* is to call our attention to this forgotten reservoir of embodied knowledge and recover it from the rise of abstract systems that privilege information as a perfect form of inscription. This purpose is complicated by the more nuanced view Hayles adopts in the later *My Mother Was a Computer*, discussed earlier, in which Hayles admits that the binary relationships in her earlier work were too simple. It is this more nuanced view I intend to follow, tracing the ways that the body and embodiment, inscription and incorporation, shape the history of Wikipedia and current practices on the site without privileging either one side or the other. This is made difficult by the fact that,
as Hayles observes, making either the body/inscription or embodiment/incorporation salient tends to obscure the other. “When the focus is on the body,” she writes, “the particularities of embodiment tend to fade from view; similarly, when the focus is on inscription, the particularities of incorporation tend to fade from view” (Hayles, 1999, p. 199). Nevertheless, it is my goal to deploy this framework in such a way that will allow me to capture some of the ways that these binaries interact with and inform one another.

Let me briefly sketch here the relationships between embodiment and the body, inscription and incorporation, that this dissertation will demonstrate existed in the FOSS community and informed the early Wikipedia. Hayles argues that, “when changes in incorporating practices take place, they are often linked with new technologies that affect how people use their bodies and experience space and time” (Hayles, 1999, p. 205). I will argue that the emergence and rise to near-ubiquity of the personal computer during the last two decades of the twentieth century represents precisely this, the introduction of a new technology that affects, “how people use their bodies and experience space and time.” The FOSS movement may trace its prehistory to Richard Stallman’s experiences with the MIT AI lab’s shared PDP minicomputer, but it came of age in the era of the PC. This material environment, I will demonstrate, deeply affected the practices of incorporation of the FOSS community. Hayles, reflecting on phenomenologist Merleau-Ponty’s understanding of typing as an incorporating practice, writes that, “when we say that someone knows how to type [...] we mean that this person has repeatedly performed certain actions until the keys seem to be extensions of his or her fingers” (Hayles, 1999, p. 199). So too, the coders of FOSS incorporated the PC into their sense of self on an almost bodily level. This incorporation had the potential to profoundly shape their understanding
of the world since, as Hayles puts it, “because it is contextual, resistant to change, and obscure to
the cogitating mind, [incorporated knowledge] has the power to define the boundaries within
which conscious thought takes place” (Hayles, 1999, p. 205).

I will suggest that the FOSS movement responded to their new form of technological
embodiment, and anxieties about the computing devices that they had become so intimately
attached to being dominated by forces external to themselves, by developing an idealized form of
this embodiment: a body. This ideal body, which I will call the “Cyborg Individual,” sought to
universalize the particular situation of FOSS hackers, holding up the model of the individual
computer owner as master of his or her machine, just as the modern self sought to master his or
her body. This ideal body, I will argue, served to render early Wikipedians and other proponents
of the system of peer production, which FOSS helped bring into being, blind to the possibility
that the utopia of shared information and shared intellectual labor that they sought to create
might need shared physical resources to support it. Instead, these peer production idealists
valorized the flexibility and freedom afforded by the Cyborg Individual. Here, I must be careful
to follow Latour’s constant warnings not to flatten complicated systems of inter-related human
and non-human actors into the puppets of invisible and invincible “social stuff.” Instead, my
history attempts to trace the complicated ways that technologies, discourses, and human actors
interacted to create culture, and suggest some of the complicated results of that shared creation.

Wikipedia is itself an outgrowth of the FOSS culture of Cyborg Individualism, however I
will show that the actual form of Wikipedia no longer reflects the ideal of the Cyborg Individual.
Instead, Wikipedia has taken the form of what Nicholas Carr calls an “information utility” in
which information processing and distribution is concentrated in a centralized form. I will chart
the evolution of Wikipedia into this form, and suggest that Wikipedia's rapidly shifting and mutating text, an example of what Hayles calls a “flickering signifier,” perversely makes Wikipedia's physical form resistant to change. The emergence of this “information utility” form, what some call “cloud computing,” has caused anxieties about the loss of individual agency to electronic domination, the very anxieties the Cyborg Individual sought to defuse, to re-emerge. These anxieties may not be completely unreasonable, however my case studies of the contemporary Wikipedia suggest that a return to the well-bounded individual, cyborg or no, may not be the best way to deal with them. Instead, I will demonstrate how Wikipedia editors are negotiating new, shared forms of electronic agency, negotiating the tricky terrain of body and embodiment, inscription and incorporation as they do so. In the final chapters of this dissertation, I investigate the details of how this new, shared form of electronic agency works in practice. In the next section, I explain the various methods I employ to accomplish each of these goals.

**Methods**

Throughout this dissertation, I have attempted to follow Latour’s advice and “follow the actors” responsible for Wikipedia. That is to say, I have attempted to account for as many of the diverse actors at work in Wikipedia's creation and functioning, and the role of each within the site, without reducing any actor to a stand in for others. This task is made easier by the fact that many of the actors involved in the Wikipedia project, namely the user-editors of the various wiki sites and the software that assists them, leave extensive traces of their activity by virtue of the basic design of Wiki systems. In fact, almost all editing activity on Wikipedia is recorded automatically, creating an extensive archive of material. I describe some of the ways Wikipedia records editor activity below; I have also provided some context to allow readers who are not
intimately familiar with Wiki to understand how the site functions and why it records this information. In addition, other entities that may play an active role within Wikipedia may not leave these easily visible traces on the Wiki sites themselves. These entities include the sources of funding for the various Wiki sites, search engines and other online interests that make use of the content provided by Wikipedia, the physical infrastructure that Wikipedia rests on, and others. I have turned to popular and trade press sources, reports on the finances of the Wikimedia foundation and other sources detailed below to retrieve possible traces of these entities at work.

Before discussing my sources, I should briefly define some terms used by participants in the Wikipedia community to discuss these communities and their fellow collaborators. In most instances, users that contribute to Wikipedia refer to themselves and their fellow collaborators as *editors*. Regular editors make up the core of the Wikipedia project. About 50,000 editors make more than 5 edits to the site per month (Wikipedia:Wikipedians). Some editors, who have been granted access to a suite of additional tools for policing and modifying the site, are known as *administrators*, or more commonly *admins*. As of September 2010, there were about 803 active admin accounts on Wikipedia (Wikipedia:List of administrators). Software programs that automatically or semi-automatically perform various functions on the site (such as, for example, removing obvious vandalism) are known as *bots*. 
This section will provide the basic “anatomy” of Wikipedia. The software used to build Wikipedia, called Mediawiki, handles the display of content and allows users to edit content from their web browsers. Figure 1 shows a screen capture of a typical page of content on a Mediawiki based wiki, in this case the main page of the English Wikipedia. Each page of content that a Mediawiki Wiki displays, which I will call a content page, has two other pages associated with it. These pages, which are accessed via the tabs labeled “discussion” and “view history” seen near the top of Figure 1, provide the user to access information related to the content page. The tab labeled “discussion” links to the discussion page, which is sometimes called a “talk page,” where editors can communicate with one another and coordinate the collective process of producing and refining the content. Discussion pages are usually not heavily used for simple or non-controversial articles, for example despite the fact that the English Wikipedia article on the tomato provides a great deal of useful information about this vegetable (“Tomato,” 2009) the
associated talk page (“Talk:Tomato,” 2009) only displays a few relatively short comments; however, controversial subjects, for example Barack Obama (“Talk:Barack Obama,” 2009), can generate a great deal of discussion and debate, in the case of Mr. Obama the discussion page requires some 56 separate “archive pages” to organize older discussion. Finally, the “history” tab provides access to a history page, which allows users to view a list of all of the past revisions to a given content page, along with the time and date of each revision, the editor responsible for each revision, the amount of data added to or subtracted from the content page (measured in bytes), and a brief “edit summary” giving information about how the content page had been changed for this revision. See Figure 2 for a better idea of how this information is listed. Both content pages and discussion pages have associated history pages.

Figure 2.

Revision history of Abraham Lincoln
From Wikipedia, the free encyclopedia
View history for this page

For any version listed below, click on its date to view it. For more help, see Help:Page history and Help:Edit summary.
External tools: Revision history statistics • Contributors • Revision history search • Number of watchers • Page view statistics

(cur) = difference from current version. (prev) = difference from preceding version. m = minor edit. = = section edit. = = automatic edit summary

(latest | earliest) View (newer 50 | older 50) (20 | 50 | 100 | 250 | 500)

Compare selected revisions

* (cur | prev) 10:06, 20 March 2011 PeanorStar? (talk | contribs) (133,237 bytes) (+=External links: add authorized form of name from LC auth. file)
* (cur | prev) 09:56, 20 March 2011 PeanorStar? (talk | contribs) m (133,204 bytes) (+=External links: add authorized form of name from LC auth. file)
* (cur | prev) 05:25, 20 March 2011 JimWink (talk | contribs) (123,204 bytes) (A)
* (cur | prev) 23:10, 19 March 2011 Environnement2100 (talk | contribs) (133,204 bytes) (localizing)
* (cur | prev) 19:31, 19 March 2011 Cylcobot (talk | contribs) m (133,195 bytes) (Robot - Removing category 19th-century presidents of the United States per CFD at Wikipedia:Categories for discussion/Log2011 March 9.)
* (cur | prev) 08:57, 17 March 2011 Grammarspeichacker (talk | contribs) (133,253 bytes)
* (cur | prev) 08:24, 17 March 2011 Grammarspeichacker (talk | contribs) (133,252 bytes)

Content pages may, in turn, be broken down into several categories based on the sort of content they present. These categories are known as “Namespaces,” from a computer science
term for a classification system that allows one to distinguish between different entities that share the same name. Sites using the Mediawiki software have access to 18 separate namespaces by default (“Help:Namespace,” 2009), but I will only describe a few of the most active namespaces here. Technically, discussion pages are organized into their own namespace, called talk, but I deal with them separately since they are always connected to an associated content page. The main namespace houses those content pages that contain the information the site wishes to present to readers, in the case of Wikipedia, encyclopedia articles. The user namespace provides a place for content pages that are associated with all of the editors of a given project, including both those editors that have chosen to sign up for user names and those editors who are identified by their IP address. User pages provide a space for editors to tell the community a little bit about themselves and their interests. The associated talk pages provide an important space for users to contact one another and discuss things. The help namespace provides a place for editors to create how-to guides and other documents that provide advice for creating and editing content.

One final namespace, the project namespace, deserves discussion at length because of the complicated role it plays within the larger and older projects of the Wikimedia constellation, especially Wikipedia. The project namespace provides a place for content pages discussing the goals of a given project, for working on administrative tasks, and for describing best practices for participants within this project. On the English Wikipedia, which has the largest and most structured collection of this sort of information, these can be sorted into two broad groups. First are the policy, guideline, and essay pages, which provide standards for behavior on Wikipedia. Policies are, “considered a standard that, with rare exceptions, all users should follow,” whereas
guidelines, “are considered more flexible than policies” ("Wikipedia:Policies and Guidelines,” 2009). Essays are yet less official, reflecting only the opinion of some editor or group of editors as to best practices, though they often can be quite influential. Editors are dissuaded from hastily editing policy and guideline pages, which are marked with language warning that, “any edit to [this page] should reflect consensus. Consider discussing potential changes on the talk page first.” It is common practice for editors to invoke policies, guidelines, and essays during debates over content. Second are discussion pages that provide a space for editors and admins to engage in a variety of tasks. For example the Articles for Deletion page lists articles that are currently being considered for deletion from Wikipedia under the Nomination for Deletion process. Editors may use entries on the list to discuss if they think a given article should be retained on or deleted from Wikipedia. Admins will then refer to this list to make final decisions regarding the deletion of articles.

I draw off of all of the above types of content in this dissertation. In the case of projects other that the English Wikipedia, which may have less defined categories of content within the project namespace, I will categorize content by analogy to the closest available category on the English Wikipedia.

**Wikipedia Mailing Lists**

Another important source of information for this dissertation are the electronic mailing lists used by Wikipedia editors for communication. There are several such lists, but this dissertation will draw primarily from the following three. The Wikipedia-L list is devoted to discussion of the Wikipedia project, taken as a whole. During the first few years of Wikipedia's existence, it was a central and highly active site of discussion about the future of the project. The
WikiEN-L list was introduced in 2003 to serve as a list for discussing the English Wikipedia project. As this project grew, most discussions about day to day policy and activity on the English Wikipedia moved here, leaving Wikipedia-L for discussion of larger issues effecting all of the different language Wikipedia projects. Nupedia-L was the mailing list for Nupedia Encyclopedia project, now defunct, which Wikipedia grew out of. Some posts to the Nupedia list in the days leading up to and immediately following Wikipedia's creation provide useful information about the genesis of the project.

**Non-Wiki Sources**

In addition, I will consult several other sources of information in addition to the sites of the Wikimedia Constellation and their associated mailing lists. Wikipedia has been a popular subject in the mass market press almost since its inception. The New York Times ran a short piece on Wikipedia within 9 months of the project's beginning (Johnson, 2001) and over the course of Wikipedia's history it has been the subject of articles in a wide variety of publications including Wired (Mayfield, 2003), The New Yorker (Schiff, 2006), and The Economist (“The free-knowledge fundamentalist.,” 2008). It has also been the target of critical editorials in such venues as The Guardian (Finkelstein, 2007) and The Register (Metz, 2007). This coverage provides valuable information about Wikipedia's reception in the popular press, helps to provide a sense of how criticism of Wikipedia and the Wikimedia constellation has changed over time, and provides a record of public comments by important people involved in the Wikimedia constellation, such as Jimmy Wales and Larry Sanger.

Wikipedia has also attracted considerable attention from such prominent technology websites as Slashdot (“Wikipedia Reaches 100,000th Article,” 2003) and Kuro5hin (“Wikipedia
Editor Larry Sanger Resigns,” 2002). The coverage provided by these websites is valuable to this dissertation for several reasons. First, as I will discuss later, there is considerable evidence in the mailing list record that participants in the early Wikipedia actively reached out to these sites to attract attention for the project. Thus, the coverage given to the early Wikipedia by these sites is an important part of how it established itself as a successful project. These sites also often cover the interaction of Wikipedia with outside forces such as corporations and governments, they provide a record of attempts to by governments to censor Wikipedia and other significant events. Furthermore, sites like Slashdot have extensive communities of their own, and the comments left on stories by Slashdot users and others provides a record of reactions within the larger Internet community to events involving the Wikipedia.

This dissertation will also draw on three other sources of data. The public corporate information of the not-for-profit Wikimedia foundation provides important information regarding the finances and operations of Wikipedia. In addition press releases and other publicity issued by the Wikimedia Foundation and their various corporate partners provide data about the activities of these companies. On several occasions, I made use of the Internet Archive's “Wayback Machine” feature to investigate old versions of webpages related to Wikipedia. Finally, Wikipedia maintains a site at nostalgia.wikipedia.org that contains an archived version of Wikipedia as it existed during its first year of operations. On some occasions I refer to this archive for very early versions of Wikipedia content and policy.

In this chapter I have established the theoretical and methodological tools that I will employ over the course of the remainder of this dissertation. In the next chapter I begin my investigation of Wikipedia by investigating the history of the larger hacker culture that played an
important role in Wikipedia’s genesis. As we will see, the ideal body produced by this culture, which I call the cyborg individual, helped resolve anxieties specific to the embodiment experienced by hackers in the last years of the twentieth century.
CHAPTER THREE – EMBODYING FOSS

In the previous chapters, I explained how the Actor-Network sociology of Bruno Latour, and the concept of “embodiment,” as developed by N. Katherine Hayles, could be used to build a more complete understanding of the relationships between the text of Wikipedia, the community that builds that text, and the technological infrastructure that both the text and the community rely on. In this chapter I begin to explain the specific understanding of the Wikipedia phenomenon I have built using these theoretical tools. I do that by explaining how a particular ideal body, which I call the “cyborg individual,” forms an important part of Wikipedia’s heritage. It is important for us to understand this ideal, and its attendant lens for viewing the world, since ultimately both would influence the Wikipedia project. This chapter is devoted to a detailed reading of the historical situation that created the cyborg individual. By understanding its historical construction, we can better understand how it would later play a role in Wikipedia.

To accomplish this goal, I perform several tasks over the course of this chapter. First, I use the One Laptop per Child (OLPC) project to illustrate the values that make up the ideal of cyborg individualism. The OLPC project, while not immediately related to Wikipedia, is a good concrete example of the cyborg individual ideal. Through the metaphor of OLPC, I hope to demonstrate to the reader what sorts of values make up the cyborg individual. Once I have established what the cyborg individual ideal is, I will move on to explain the historical genesis of this idea. It is important that we understand how the cyborg individual is a historical construction. To build this understanding I first investigate the form of embodiment inhabited by hackers in the last years of the twentieth century. Autobiographical accounts by Linux founder Linus Torvalds, and others in the hacker community, speak to how intimate a role personally
owned computing devices had come to play in their lives by the 1990s. In a very literal way, the embodiment they experienced was cyborg, a fusion of human and machine. This way of being had both a specific historical impact, and a specific historical genesis. In this chapter, I investigate both. First I explore the historical trends that lead to the personal computer, showing how these devices were built to respond to a particular desires for both freedom and mastery on behalf of hackers. I go on to show how, as the personal computer became a feature of everyday life, hackers were opened to a unique set of anxieties about agency and domination created by a particular double-movement of computing machinery permitted by the rise of the abstract protocols of source code and the internet. On one hand, these abstractions allowed for machines to be used readily, but on the other hand they concealed the workings of these machines behind various forms of mediation. Ultimately, I argue, these anxieties were answered by the ideal of the cyborg individual.

**The Cyborg Individual Illustrated: OLPC**

The panopticon familiar to Foucault readers, Hayles reminds us, was never actually built. Nevertheless, Foucault successfully uses this never realized model prison, with its central tower for observation and individual cells that subject prisoners to constant observation, to discuss a particular type of idealized body. Through the image of the panopticon, Foucault makes vivid the disciplinary forces acting upon the modern body, demanding that it conform to its ideals. He does this so well that the term "panoptic" is readily invoked outside of academic discourse. I would like to attempt a similar move here. To discuss the ideal body of the cyborg individual, I will invoke a technological image that will serve to make vivid and concrete the contours of what

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6 That is to say, Bentham never realized his plan to build the Panopticon in France. Prisons based on Bentham’s model were built elsewhere.
might otherwise be a slippery abstraction. The One Laptop Per Child (OLPC) project illustrates the ideals, possibilities, and dangers of the body I am calling the cyborg individual. Like the panopticon, OLPC is an (as yet) unrealized technological vision. The OLPC project is not the only attempt to realize the ideals of cyborg individualism, nor does it express those ideals in a transcendent way that all of the members of the hacker communities I am discussing would agree with. It is, however, a useful and vibrant image of the cyborg individual with which we can begin our discussion.

OLPC is the brainchild of MIT Media Lab founder and noted proponent of all things digital, Nicholas Negroponte. The project's mission is, in its own words, "to create educational opportunities for the world's poorest children by providing each child with a rugged, low-cost, low-power, connected laptop with content and software designed for collaborative, joyful, self-empowered learning" ("One Laptop per Child (OLPC) Vision," n.d.). To this end, OLPC has designed and produced a unique looking, and uniquely capable, device, known as the XO laptop, designed specifically to be used by children in developing countries. The bright green and white XO laptop, with its distinctive twin WiFi antennas, has been in production since 2007 ("One Laptop per Child (OLPC): Project," n.d.) and the project has, by its own count, distributed 1.3 million of the devices as of December 2009 ("Deployments - OLPC," 2009). This falls far short of Negroponte's ambition of near universal distribution to every child in the developing world, but nonetheless represents a significant and highly visible achievement. In 2009, the OLPC project suffered setbacks related to the global financial crisis, and was ultimately forced to downsize. In January of that year, Negroponte released a statement announcing that "we are reducing our team by approximately 50% and there will be salary reductions for the remaining
32 people” (“Refocusing on our mission | One Laptop per Child,” 2009). However, despite these setbacks, OLPC has continued development and deployment of laptops and other portable computing devices in accordance with its mission. In late 2009, the project released concept pictures depicting a possible successor device to the XO laptop, the XO-3 tablet computer. In early 2010, OLPC called publicly for donations of XO laptops to earthquake victims in Haiti.

The OLPC project illustrates features of the ideal body of the cyborg individual, an ideal I will later show informed the Wikipedia community. OLPC may share this ideal with Wikipedia because, like Wikipedia, the OLPC projects has strong links to the FOSS community where, as I establish later in this chapter, the cyborg individual ideal originated. The OLPC's XO laptop was initially released running a customized version of the Fedora Linux distribution as its operating system, and the default software load-out for the XO includes many other pieces of Free software. The OLPC project also developed its own "Sugar," a Free software child friendly user interface for the XO laptop (“Software components - OLPC,” n.d.). OLPC took what could be characterized as a large step away from the FOSS community in May of 2008, when they, along with Microsoft, announced an agreement to release XO laptops configured to run either Linux or Windows XP. This move towards embracing proprietary software, which Negroponte explained as being in part driven by the need for OLPC, "to bid on [government] educational technology contracts, some of which require that Microsoft Windows be able to run on our hardware," (Negroponte, 2008) was criticized by Free Software Foundation founder Richard Stallman, who wrote that, "those who have supported the OLPC project with their effort or their money may well feel betrayed" (Stallman, 2008). However, despite this apparent schizm, the OLPC project remains deeply tied to the world of FOSS. Stallman, in the message quoted above, goes on to
write that he has gone ahead with plans to begin using an XO laptop as his personal computer. Another Linux developer, employed by the Red Hat Linux development company to work on OLPC, writes that he is upset about the backlash against the decision to include Windows on some XO laptops expressed on popular hacker blogs, such as the influential Slashdot. Concerns about Windows are overblown, he writes, "OLPC builds XOs with Linux. OLPC will continue to build XOs with Linux. OLPC has no plans to change this. None"(Paul, 2008). Furthermore, the unhappiness expressed by FOSS community members about the incursion of Windows onto the XO laptop demonstrate the importance of this project to the larger FOSS community.

The OLPC project illustrates four key aspects of the ideal body that is the cyborg individual. First, the project stresses individual ownership and control of individual laptop computers. The envisioned ideal distribution of computing hardware among human bodies is literally given to us in the projects name: One Laptop Per Child. The "Five Principles" at the core of OLPC's mission statement, further demonstrate their commitment to this ideal. Under the principle of "Saturation," they write that they, "aim to reach 'digital saturation' in a given population. The key point is to choose the best scale in each circumstance. It can be a country, a region, a municipality or a village, in which every child and teacher will own a connected laptop" (“OLPC:Five principles - OLPC,” n.d.). The reasons behind this desired even distribution of computing devices is here explained as rooted in community, "With [digital saturation], the whole community becomes responsible for this focus on shared education, and the children receive support from the many institutions, individuals and groups around them," but earlier in the document, under the principle of "Child Ownership," we can see how individualism is understood by OLPC as foundational to the digitally empowered communities they are building.
They write that, "An essential aspect of OLPC is the free use of the laptop at home, where the child and the family together can greatly increase the practice time normally available at a school lab or library. The ownership of the XO is a basic right, coupled with new duties and responsibilities: including protecting, caring for, and sharing this creative environment" ("OLPC:Five principles - OLPC," n.d.). Here we clearly see how OLPC expects their devices to be integrated into the same spaces where their child owners live. Further, the language of computer ownership as a "basic right" suggests that OLPC sees the ownership of computing devices as equivalent to such rights as those delineated in the UN's "Universal Declaration of Human Rights." Many of these "basic rights," such as the right "to life, liberty and security of person," and the prohibition of "torture or [...] cruel, inhuman or degrading treatment or punishment," ("The Universal Declaration for Human Rights," 1948) ensure individuals the ability to freely control their own bodies. So too, under the ideal distribution of computing machinery OLPC imagines, individuals are guaranteed the right to control their own machines.

Furthermore, the OLPC’s core principles also attempt to ensure that XO laptops, and their owners, treat each other as equals in an important technical sense. They state that, "the XO has been designed to provide an engaging wireless network. The laptops are connected to others nearby automatically"("OLPC:Five principles - OLPC," n.d.). To this end, the XO has been equipped with the necessary software and hardware to create what is called a "wireless mesh network." In such a network each computer connects directly to nearby peers via a digital radio network. There is, in a strict technical sense, no hierarchy in such a network, as there is in a client-server network arrangement, in which many computers connect to a single, central server to coordinate communications. Such a network capability is not a mere technical novelty. It is an
important attempt to realize, in the XO laptop, an ideal arrangement of individually owned computers and their human masters. Such a network actively attempts to prevent any one computer user from dominating his or her neighbors.

Thus, the OLPC mission statement imagines a computing device that supports the liberal individual in two ways, by guaranteeing each the right to own and control his or her own computing device, and by ensuring that the network devices connect to will be a network of (technical) equals. Perhaps one reason it is anxious to ensure that these liberal rights are extended to apply to computing devices is because of the close connection it envisions between the bodies of its users and their machines. The Five Principles tell us that OLPC envisions "a connected laptop" as, "more than a tool. It is a new human environment of a digital kind" ("OLPC:Five principles - OLPC," n.d.). To ensure that this new human environment can go anywhere human bodies go, the XO laptop was designed to be rugged, durable, and useable under a variety of lighting conditions. Furthermore, in a telling moment in his 2007 TED talk, Negroponte stresses the importance of keeping the power requirements of the XO laptop below two watts. The two watt limit is necessary, he says, because two watts represents the amount of power that can be generated with "the human upper body" ("Nicholas Negroponte on One Laptop per Child, two years on," 2007). Early prototypes of the XO laptop even included a hand crank on the computer itself, for use in hand charging the devices battery (the crank was later removed from the laptop and added to an external power supply unit). The human body is not only the owner and user of the XO laptop, it is also its power source. Here we see how cyborg individualism blurs the line between human and computer, desiring the two to be deeply intertwined. Given such a close relationship between flesh and machine in this ideal body, is it any surprise that there seems to be
anxieties about the possibility of the machine component being breached or dominated?

In a telling example, Richard Stallman voiced these exact anxieties in his message to the OLPC community decrying their decision to produce a version of the XO capable of running Windows. Stallman writes:

> Teaching children to use a proprietary (non-free) system such as Windows does not make the world a better place, because it puts them under the power of the system's developer -- perhaps permanently. You might as well introduce the children to an addictive drug (Stallman, 2008).

We can see here that, for Stallman, the power exercised by proprietary software over a child's computer is the same as the power exercised over a child's body by a narcotic. In both cases, autonomy is compromised by an agent outside of the child's conscious control. When machines and bodies are so tightly coupled that bodies power attendant machines, anxieties about the autonomy of machines become anxieties about the autonomy of subjects.

A final feature of this ideal human machine hybrid, the cyborg individual, as illustrated by OLPC: it understands information as fundamentally immaterial. In their mission statement, they write, "By giving children their very own connected XO laptop, we are giving them a window to the outside world, access to vast amounts of information, a way to connect with each other, and a springboard into their future" ("One Laptop per Child (OLPC): Mission," n.d.). The metaphor here is telling. For OLPC, the devices they produce are "windows," mere transparencies that allow "vast amounts of information," to flow freely through, as bodiless and insubstantial as light.

This metaphor should not be particularly surprising coming from an organization started
by Mr. Negroponte, who's 1996 *Being Digital* made the case for treating information as essentially different and separate from matter. That book's basic contention, that there is "a fundamental difference between atoms and bits," (Negroponte, 1995, p. 4) has since become almost axiomatic among technologically adept subcultures. The "different" nature of bits renders them, in Negroponte's view, almost effortlessly mobile, capable of being nearly omnipresent, and reproduced perfectly across a wide variety of material forms. In the early pages of Being Digital, Negroponte employs the same "window" metaphor that would later be used in the OLPC mission statement. He predicts, "twenty years from now, when you look out a window, what you see may be five thousand miles and six time zones away" (Negroponte, 1995, p. 7). Through the use of the window metaphor, Negroponte depicts information technology as the sort of ideal, disembodied machine Haraway describes in "Cyborg manifesto," "our best machines are made of sunshine; they are all light and clean because they are nothing but signals, electromagnetic waves" (Haraway, 1991, p. 153).

The OLPC project, then, illustrates the ideal body of the cyborg individual. Cyborg individuals consist of a fusion of humans and individually owned computing devices, as individual children own XO laptops. Cyborg individuals connect to each other in egalitarian networks, as XO connected children connect into wireless mesh networks. Cyborg individuals are tightly coupled human machine hybrids, as the XO laptop could even draw power from its human partner. Finally, Cyborg individuals are able to access a vast pool of disembodied information, as children and their XO laptops can access the “outside world” via the internet. In the next section, I go on to explain the historical origins of these features of the cyborg individual ideal.
The Genesis of Cyborg Individualism: Hacker Embodiment

I selected OLPC to provide my initial illustration of the cyborg individual, not because it is the only example of this ideal body but because it is perhaps the most tangible and vivid. Many other examples of the discourse of cyborg individualism can be found in the work of advocates and practitioners of FOSS and related peer-production environments. For example, Yochai Benkler contends, in his *Wealth of Networks*, "in the networked information economy, the physical capital required for production is broadly distributed throughout society. Personal computers and network connections are ubiquitous" (Benkler, 2006, p. 7). In the ideal scenario Benkler calls the "networked information economy," like the ideal scenario imagined by OLPC, computing devices are broadly distributed, tightly tied to individuals and under their direct control in a way that renders them relatively autonomous, free to pursue "diverse motivations." Benkler imagines that these cyborg individuals will be able to freely join in "cooperation with other individuals acting for complementary reasons," (Benkler, 2006, p. 7) in ad-hoc productive arrangements, just as OLPC envisions its users joining in non-hierarchical learning communities with their neighbors. Finally, just as Negroponte firmly divides the world between material atoms and immaterial bits, so too Benkler limits his networked individuals to cooperating on information products only, writing that, "there are no noncommercial automobile manufacturers. There are no volunteer steel foundries" (Benkler, 2006, p. 35). In chapter four, I will demonstrate how the ideal body of the cyborg individual affects both Benkler’s understanding of Wikipedia, and the understanding early Wikipedians have of their own project. However, to fully understand these effects, first we must understand the historical genesis of the cyborg individual ideal.

Furthermore, it is important that, in considering this ideal form, we do not render the
ideal itself an invisible and immaterial form. That is to say that, following Latour, I don't want to engage with the cyborg individual as a sort of "social stuff," or as a purely ideological form that determines the words of authors and actions of technologists. Instead, in the remainder of this chapter, I want to show how the cyborg individual is, at least in part, a product of a specific set of associations between human and non-human actors in the world of late 20th century FOSS hackers and closely related groups. In particular, the cyborg individual ideal may arise out of the very real tight coupling between the bodies of computer users, including FOSS hackers, and their computing devices, and very real anxieties about the possibilities of this tight coupling to open users to potential domination by software developers and others. These anxieties pre-exist the personal computer, and the FOSS movement as such, but the articulation of desire, anxiety, and the particular technology of the internet connected PC helps to shape the ideals that form the cyborg individual. In Hayles' terms, I am arguing that the ideal body of the cyborg individual arises, at least in part, out of the particular form of embodiment experienced by FOSS hackers in the last decade of the 20th century.

The "hands on imperative" and the evolution of the personal computer

Privileged first world subjects, such as the readers of this document, are perhaps used to the presence of powerful, individually owned computing devices in their lives. The ubiquity of the personal computer has become banal. We carry around friendly, helpful machines with more computing power than the most powerful computers used by NASA to design and launch human beings on their mid-twentieth century voyage to the moon in our hip pockets. This was, of course, not always the case. Once upon a time computers were distant, unfriendly devices that existed in sealed computer rooms, under the watchful eyes of professional operators. The
emergence of small, powerful, *individually owned*, computing devices was neither inevitable nor automatic. Instead, it is the result of a particular history, a history shaped by human desires. The desires that drove the historical construction of the personal computer also inform the construction of its attendant ideal body, the cyborg individual.

By the last decade of the 20th century, the language used by those most closely tied to these powerful and ubiquitous computing devices, the programmers (or, as they often call themselves "coders") responsible for creating and maintaining computer software demonstrates how they feel intimately connected to these machines. Richard Stallman writes, in a touching aside to one of his essays describing the history of the GNU project, of naming a prototype operating system kernel "Alix," "after the woman who was my sweetheart at the time" (Stallman, 2002, p. 29). This act of naming is not simply an attempt by Stallman to humanize the computer, rather it is a pun based on the fact that, as Alix herself pointed out to Stallman, "her name would fit a common naming pattern for Unix system versions [the Unix operating system came in many different versions, many of which took names ending in -ix]" (Stallman, 2002, p. 29). The machine is not made to recall the lover, rather the lover already recalls the machine.

Stallman is not the only one to experience this sense of lover-like intimacy with computing devices. Ellen Ullman, a software engineer who, while not a core part of the FOSS movement (though interviews establish that she is aware of it), leaves us an important record of the anxieties of late 20th century coders in her memoir *Close to the Machine*, also compares technologies to lovers. In a section of her book in which she reflects on the bewildering number of new computer languages, programming environments, and other technologies she has

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7 Stallman's GNU (a recursive acronym standing for GNU's Not Unix) project was a foundational project for the FOSS community. It sought to create a version of the Unix operating system free from copyright restrictions. Both software developed by the project, and the software license it created, remain in wide use today. The early Wikipedia made significant use of both.
experienced during her career as a coder, she writes "the process of remembering technologies is a little like remembering all your lovers: you have to root around in the past and wonder, Let's see. Have I missed anybody?" (Ullman, 1997, p. 101). For Ullman, machines and lovers become conjoined ways of marking history, of seperating her life into epochs. She writes, "I'm a dedicated serial monogamist - long periods of intense engagement punctuated by times of great restlessness and searching. As hard as this may be on the emotions, it is a good profile for technology" (Ullman, 1997, p. 101).

Like Ullman, Linus Torvalds, the Finnish hacker who wrote the earliest version of the Linux kernel, and remains responsible for this complex and widely used piece of software, also makes this connection between computers and lovers. In his 2001 auto-biography, co-authored by David Diamond, he writes "some people remember time according to the cars they drove or the jobs they held or the places they lived or the sweethearts they dated. My years are marked by computers" (Torvalds, 2001, p. 39). Significantly, he goes on to make clear that the computers he uses to mark time are personal computers, machines that he lived with and that played an important part in his childhood, including a grandfather's Commodore VIC-20 and the Sinclair QL that Torvalds purchased with horded allowance money in elementary school. The sense of intimacy that coders feel for their machines is not unique. As Torvalds points out, others may feel this sense of intimacy for automobiles. However, the link between coder and machine, as we will see, would connect to larger historical processes to inform the ideal of the cyborg individual.

As the example of Torvalds makes most clear, by the time FOSS emerged in the 1990s the individually owned personal computer is an intimate part of the lives of coders. To understand how this came to be, and what desires drove this intimate coupling, we need to look
at an earlier era of computing history. Steven Levy's widely cited *Hackers: Heroes of the Computing Revolution* provides us with one window into this history. Levy calls the desire to have "direct access" to computing equipment, which he suggests existed in both the MIT AI Lab Hacker community and the Silicon Valley Homebrew Computer Club (an organization that helped to give birth to the personal computer), the "Hands On Imperative." He describes this imperative in one of the six points of his famous Hacker Ethic: "Access to computers - and anything that might teach you something about the way the world works - should be unlimited and total. Always yield to the Hands-On Imperative!" (Levy, 1984, p. 40). The late 50s MIT Hackers, Levy tells us, expressed this imperative when, frustrated by their inability to directly access the university's closely guarded mainframes, they "harbored the kind of restless curiosity which led them to root around campus buildings in search of ways to get their hands on computers" (Levy, 1984, p. 22). According to Levy, Lee Feldstein, one of the founding members of the Homebrew Computer Club, an informal meeting for 1970s and 80s hardware hackers that would help to educate important computer designers including Steve Wozniak, hoped to, "break computers out of the protected AI towers, up from the depths of the dungeons of the corporate accounting departments, and let people discover themselves by the Hands On Imperative" (Levy, 1984, p. 157).

Levy argues that it is this Hands On Imperative that drove the hackers to seek ever closer and less mediated connections to computers. Like Stallman chastising OLPC for exposing children to the "drug" of closed software, or Torvalds and Ullman comparing computers to lovers, Levy often uses the language of seduction and addiction to suggest the desire Hackers felt for this direct access to machines. He quotes Homebrew Computer Club member Steve
Dompier's reflection on his first communications with a simple interactive computer program, "that's the addictive part, that first magic where this machine talks back to you and does mathematics incredibly fast" (Levy, 1984, p. 193). Bob Albrecht, another early Homebrew Computer Club member and founder of the 70s era alternative computing tabloid People's Computer Company, is described as "indoctrinating people into the computer world," with a "sly dope dealer approach: 'Just take a hit of this game ... feels good, doesn't it?'" (Levy, 1984, p. 171). Perhaps the single clearest example of the seduction of the hands on imperative is the following anecdote about a reporter dispatched to write up the People's Computer Company (PCC) for his own publication:

As an indication of how captivating the machines could be, one reporter doing a story on the PCC came in around five-thirty one day, and the workers sat him down at a teletype terminal running a game called Star Trek. 'The next thing I remember,' the reporter wrote in a letter to PCC, 'is that somebody tapped me on the shoulder at 12:30 A.M the next morning and told me it was time to go home.' After a couple of days of hanging out at PCC, the reporter concluded, 'I still have nothing to tell an editor beyond that I spent a total of twenty-eight hours so far just playing games on these seductive machines (Levy, 1984, p. 174).

To a certain extent, Levy's narrative presents the emergence of the individually owned micro-computer as the inevitable, almost teleological, consequence of the desires inherent in the hands on imperative. He draws a direct narrative thread from the early bay area computer enthusiasts described above, whose early experiments with bringing computerized "power to the people" often involved shared access to mainframe and minicomputer terminals, to the
Homebrew Computer Clubs attempts to build or obtain individually owned computing devices. He writes that Ed Roberts, the founder of MITS (Model Instrument Telemetry Systems), the company that would build the first kit-based personal computer (called the Altair), was driven to develop this machine in part by his experience with computers during his service in the Air Force, which left him, "in awe of their power and disgusted with the convoluted steps one had to take to get access to them" (Levy, 1984, p. 188). When MITS announced the Altair, Levy tells us there was an immediate, almost organic, demand for the device:

[...]the day the magazine [announcing the Altair] reached subscribers it was clear there would be no disaster. The phones started ringing, and did not stop ringing. And the mail bore orders, each one including checks or money orders for hundreds of dollars' worth of MITS equipment - not just computers, but the add-on boards that would make the computers more useful. Boards which hadn't even been designed yet" (Levy, 1984, p. 191).

The individually owned computer, Levy suggests here, was called into being by mass demand, demand that pre-existed the design of the device itself.

Levy is right to note this demand, however, a close reading of his own history suggests that the individually owned computer is not the only possible way to resolve the desire to direct access to machines expressed by the hands on imperative. The hacker communities he documents found ways to experience direct access to machines using shared and communally owned hardware. The MIT Hackers of the late 50s did so by re-arranging the sleep cycles of their own bodies, to bring them into line with the times the machine body they desired access to would be available, making "nocturnal visits to the lab on the off chance that someone who was
scheduled for the 3am session might not show up" (Levy, 1984, p. 29). The MIT Hackers would later arrange for greater access to the lab's PDP-1 minicomputer by making arrangements to work on programming tasks of value to the University, such as creating a simple programming language, called an assembler, for the PDP-1, at relatively low pay (Levy, 1984, p. 55). For the hackers, direct access to the computer was part of the reward.

Ultimately, the MIT hackers would arrange for direct access to the machine by producing their own operating system for a successor minicomputer, the PDP-6. This operating system, known as the "Incompatible Time Sharing System," or ITS, did much what its name suggests and allowed multiple users share time on the computer. This sharing was not perfect, but Levy stresses that, "because hackers wanted the machine to run as swiftly as it would have done had it not been time-shared, [hackers] Greenblatt and Nelson wrote machine-language code which allowed for unprecedented control in a time-sharing system" (Levy, 1984, p. 124). Even though Levy separates the Hacker experience into "generations," and assigns the MIT hackers to the "first generation," and the Homebrew Computer Club hackers to the "second generation," reinforcing his narrative of the inevitable rise of the individually owned computer, in fact the ITS era would last at MIT from the mid 1960s until 1982, when the Digital Equipment Corporation discontinued the computer that had replaced the PDP-6, the PDP-10. In the late 70s and early 80s, the young Richard Stallman would experience the community of shared hardware and shared code, and both his love for this community and his despair at its destruction, would help to inspire his GNU project (Stallman, 2002, p. 16).

Even the Silicon Valley hacker communities of the late 70s, the communities that would eventually give rise to such individually owned computing devices as Steve Wozniak's Apple
computer, practiced informal forms of hardware sharing. Levy reports that, at the close of the first meeting of the Homebrew Computer Club (held March 5, 1975):

Marty Spergel, the electric parts supplier who would be known as "the Junk Man" within the group, held up an Intel 8008 chip, just as everyone was leaving. 'Who wants this?' he asked, and when the first hand went up, he tossed the chip, the fingernail-sized chunk of technology that could provide a good percentage of the multimillion-dollar power of the TX-0 (Levy, 1984, p. 203).

Later, this sort of hardware sharing would even extend to theft, with Club members absconding with hardware belonging to their employers and trading these chips with fellow Homebrewers (Levy, 1984, p. 217).

Nevertheless, the idea that computer hardware is something that should be privately owned was clearly the dominant value of these hobbyist communities. This is evidenced by Bill Gates' famous 1976 letter to computer hobbyists, in which he objected to what he saw as the illegitimate sharing of the program he has written for the Altair (a piece of software that allowed the Altair to use the BASIC computer language) by equating software and hardware. He wrote, "As the majority of hobbyists must be aware, most of you steal your software. Hardware must be paid for, but software is something to share" (Gates, 1976). Gates’ rhetoric reveals his understanding of the values of the hobbyist community. Gates here assumed that his readers would understand hardware as private property, and invited them to extend the property metaphor to software.

Why might Gates have felt so assured that hackers would be accept his assumption that hardware is private property? The fact that these Hacker subcultures exist in a larger capitalist
society in which private property is normal surely accounts for the norm of privately owned hardware to a certain extent. However, two facts suggest against this being the whole story. First, hackers do not, as Gates pointed out, extend these property relations so easily to software. In fact they actively resist the extension of property relationships to software. In addition, the existence of hardware sharing practices in hacker communities suggests that it was possible for these communities to imagine hardware as something other than strictly owned property as well. Instead of an inevitable consequence of capitalism, we should understand the individual private ownership of hardware as resolving two important problems for hacker communities.

The first is the problem of control over computing hardware exercised by institutional and corporate owners. Levy, in keeping with his intention of portraying hackers as "heroes of the computer revolution," is all too eager to play up the hacker struggle against top-down control. He codifies "Mistrust authority - promote decentralization," as part of his Hacker Ethic, writing:

Bureaucracies, whether corporate, government, or university, are flawed systems, dangerous in that they cannot accommodate the exploratory impulse of true hackers. Bureaucrats hide behind arbitrary rules (as opposed to the logical algorithms by which machines and computer programs operate): they invoke those rules to consolidate power, and perceive the constructive impulse of hackers as a threat (Levy, 1984, p. 9).

Levy gives us many, many examples of hackers who fought the arbitrary power of the owners of machines, including the battles between the early AI Lab hackers and the administrators sent to "manage" them (Levy, 1984, pp. 105-107), and Stallman's own efforts to "persuade" AI lab users away from using passwords (Levy, 1984, p. 417). Levy quotes AI Lab hacker Tom Knight explaining why he opposed the Compatible Time Sharing System (CTSS), a computer operating
system that was not adopted by the AI Lab, which instead chose to develop ITS.

'One of the really fun things about computers is that you have control over them,'
CTSS foe Tom Knight would later explain. 'When you have bureaucracy around a
computer you no longer have control over it. CTSS was a 'serious' system. People
had to get accounts and pay attention to security. It was a benign bureaucracy, but
nevertheless a bureaucracy, full of people that were here from nine to five' (Levy,
1994, p 119).

This fight against "bureaucracy," and for direct control of computing devices, may have helped
to drive the desire for small, individually owned computers.

However, as important (and romantic) as these anecdotes are, they are not the whole
story. Hackers were not only fighting for direct access to computers free from the constraint of
bureaucrats above, they often also resented the intrusions of other computer users, especially
those they saw as ordinary, artless, or unskilled, on their hacking. Levy dubs these non-hackers
"Officially Sanctioned Users," and the disregard of the MIT AI Lab hackers for these users can
be seen in the story of Margaret Hamilton. Hamilton, while not a hacker (Levy describes the AI
Lab hacker community as an exclusively male culture), was a sufficiently skilled programmer to
go on to play a key role in developing and managing software for the Apollo program.

Nonetheless, as an officially sanctioned user Hamilton was beneath the notice of the AI Lab
hackers who, as part of an unofficial program of modifications to the PDP-1 minicomputer they
called the "Midnight Computer Wiring Society," altered the computer in such a way as to
unintentionally disable the weather simulation program that Hamilton had been working on. The
hackers had not tested their modifications worked with one of the stock programs the PDP-1
shipped with, called the DECAL assembler, that Hamilton had used to write her program. The hackers had only tested the modifications with the replacement software they had written, called the MIDAS assembler (Levy, 1984, p. 97). This is only one example of the sort of casual disregard displayed by hackers for the other users with whom they were forced to share collectively owned hardware. In another anecdote, Levy demonstrates the outright hostility that hackers could display for users they found unworthy. An MIT grad student, who Levy identifies only by the pseudonym "fubar," infuriated the hackers "by taking his printout home and fixing it there all the time [...] wasting the PDP-6" (Levy, 1984, p. 114). His punishment for behavior that, in the hackers estimation, "wasted" shared hardware? He was publicly shamed by a program, written by hackers, which interrupted his attempt get a bug-ridden piece of code to run by displaying on the screen "a huge, gleaming, phosphorescent arrow" pointing to the error, along with the message, "Fubar, you lose again!" (Levy, 1984, p. 115). The drive for individual machine ownership was not, then only a result of battles hackers fought with controlling authorities above, it may have also resulted from anxieties about sharing hardware with ordinary users below. For both of these reasons, by the time of Gates' letter to the computer hobbyist community the norm of individually owned hardware had stabilized, providing an opportunity for enthusiasts to have "direct access" to machines unfettered by either distant owners or other community members.

However, Gates' request, that the model of strict individual ownership that governed hardware be extended to software, would never be completely followed. Instead software would often be treated as something other than strict property, by both the FOSS movement, and many others. These efforts to build software on a non-proprietary model have been explored by an
extensive list of authors. Indeed, Benkler (2006) and others make the case that Wikipedia is simply the extension of non-proprietary traditions developed in the software form to the larger field of encyclopedic information. Common among these accounts of the non-proprietary management of information is the notion that information lends itself more readily to being anti-property than property because it is by its nature immaterial. Bits can be shared, atoms cannot.

Matthew Fuller, in his *Media Ecologies: Materialist Energies in Art and Technoculture* points out, in a joking way, a serious fallacy with this line of reasoning. He challenges his readers to, if they believe that bits are by their nature free to be shared among and between different forms, "try plugging a Nintendo into a Sony" (Fuller, 2005, p. 118). The punchline here is that the Nintendo and Sony game platforms, both built on digital technology, both based on bits, are completely incompatible. They have been expressly designed not to speak each other’s language, the better to lock in corporate profits. Fuller's joke points out the ways in which an ideology of disembodied information may conceal the importance of the material forms information always takes. And yet, hackers treat information as if it were disembodied, as if it were able to move effortlessly from one form to another. In the next section, I demonstrate that they are able to do so because of a carefully constructed environment that allows them to treat information as if it were "disembodied." This environment, including the use of digital bits as the basis for computing, is a real, historical, material construct. By performing the associations between machine and human elements needed to build a world in which information can act as if it is disembodied, hackers unleashed a unique set of desires and anxieties. Desires and anxieties addressed by the cyborg individual.
How Information Lost its Body: How Hackers Built New Geometries of Connections Between and Among Humans and Machines

To understand the constructed nature of the environment that permits information to act as if it were disembodied, and the implications of this construction, we can begin with the difference between ideal and actually embodied computers. Anthropologist Chris Kelty, in his study of the communities surrounding Free and Open Source Software, Two Bits, observes the same gap between actually existing and ideal computers that Fuller does in his joking exhortation to "plug a Nintendo into a Sony." Kelty writes:

There is a certain irony about the computer, not often noted: the unrivaled power of the computer, if the ubiquitous claims are believed, rests on its general programmability; it can be made to do any calculation, in principle. The so-called universal Turing machine provides the mathematical proof. Despite the abstract power of such certainty, however, we do not live in the world of The Computer—we live in a world of computers (Kelty, 2008, p. 121).

The ideal computer, Kelty suggests here, is immaterial, capable of performing any abstract manipulation of "information." This machine, like the disembodied information it relies on, Kelty reminds us, does not actually exist. Instead, we live in a world of stubbornly material "computers," each with its own quirks and idiosyncrasies, a world in which information cannot flow freely and effortlessly from the body of a Nintendo into the body of a Sony. This was particularly true, Kelty points out, in the early era of computing when, "the hardware systems that manufacturers created [...] were so specific and idiosyncratic that it was inconceivable that one might write a program for one machine and then simply run it on another" (Kelty, 2008, p.
Fast forward to today, in the opening years of the second decade of the twenty-first century. In the everyday lives of relatively well-off first world subjects (and perhaps many others) these material differences are increasingly obscured. We transfer music, movies and books (almost) effortlessly between computers, cameras, cellular phones. Undeterred by the attempts of Bill Gates and his fellow members of the information owning classes, nearly effortless unauthorized copying of software, music, and movies thrives. With a bit more effort, clever hackers may conspire to plug Nintendos into Sonys by carefully modifying the Free GNU/Linux operating system\(^8\) to run on both devices, a process called "porting." Once this labor has been done, both devices can run the same software, and access the same broader world of digital information that any internet connected computer has access to. A Wikipedia maintained list of "Linux-powered devices" notes the existence of versions of Linux that can run on Nintendo's Gamecube and Wii consoles, as well as versions running on several of Sony's Playstation devices.

The ability of enthusiastic Nintendo and Sony owners to port GNU/Linux to their devices, and thus plug them into the larger world of digital information, relies on the ability of these hackers to freely access what is called the source code of the GNU/Linux operating system. Source code is a computer science term, referring to a set of instructions describing a computer program in what is known as a "high level programming language." High level languages, such as C++ and Java, represent the instructions of the computer program in a way that a skilled human being can read and interpret. For example, in the C language, an instruction telling the

\(^8\) GNU/Linux is a computer operating system that users are free to modify. It was developed through the efforts of Stallman's GNU project, as well as those of a coterie of volunteers assembled by Torvalds, as we will see later in this chapter.
computer to print the text "hello world" on the screen would be rendered: "printf("hello world");". These instructions are then run through a special program, called a compiler, that translates them into machine code that a computer can interpret. Machine code is particular to a specific sort of computer hardware, the machine code understood by the IBM produced chip, codenamed "Broadway," at the heart of the Nintendo Wii would be incomprehensible to the Cell microprocessor the Playstation 3 is based around. Neither chip would be able to understand machine language for the Intel 80386 chip, which served as the CPU of the PC that Linus Torvalds developed the initial version of the Linux kernel for. However, source code is not so particular. For the most part, source code written for one system can be compiled to run on another. There are a few exceptions to this rule, places where source code deals with a particular piece of hardware in a particular way, dealing with these exceptions is the process of "porting" software, working the bugs out of the source code to enable it to compile on the new hardware. The effort involved in this debugging, however, is far, far less than the effort that would be required to re-write the software from scratch, especially in the case of a complex program like an operating system.

Source code, then, acts as if it were disembodied information, flowing from PCs to Nintendos to Sonys. This ability for source code to flow, for it have a "radically contingent" relationship to matter, as Mackenzie Wark puts it (Wark, 2004, p. 173) relies on making connections between different elements in a vast infrastructure of compilers, digital computers, the work of coders and many other human and non-human actors. It is constructed. Furthermore, it is the outcome of a specific historical process of construction. As Kelty tells us, "in the early days of computing machinery, there was no such thing as source code" (Kelty, 2008, p. 121). The
construction of source code, and the high-level computer languages that permit source code, involves a particular double-move in terms of the ability of programmers to exercise control over machines. On one hand, the ability to re-use and "port" code, has significant advantages, as seen above. Kelty writes that a desire, "to share an emerging corpus of algorithms, solutions, and techniques of all kinds, necessary to avoid reinventing the wheel with each new machine," helped to drive the development of high-level computer languages. In addition, the existence of high-level languages helped to enable the kind of free-form, experimental "hacking" that Levy describes in his book. Kelty tells us, "in the good old days of computers-the-size-of-rooms, the languages that humans used to program computers were mnemonics; they did not exist in the computer, but on a piece of paper or a specially designed code sheet," (Kelty, 2008, p. 122) the process of coding using these mnemonics was tortuous and slow. This prevented those engaged in it from being able to rapidly experiment by changing a program and then immediately seeing those changes at work on the machine. Programming languages helped to create the environment in which hackers could, as Levy puts it, treat interacting with a computer, "like playing a musical instrument: an absurdly expensive musical instrument upon which you could improvise, compose, and, like the beatniks in Harvard Square a mile away, wail like a banshee with total creative abandon" (Levy, 1984, p. 32).

However, even as the development of source code permitted coders to interact with machines in a more "hands on" way, interacting with the computer rather than waiting for the results of machine code slowly put together from mnemonics, it also removed coders from "direct access" to the machine by hiding the computer’s inner workings behind the abstract metaphors employed by high level languages. In order for source code to work, in order for it to
be portable, it must be abstract, it must be capable of being translated by compilers into subtly
different sets of machine instructions for different sorts of machines. A programmer engaged
with a high level language must consider the abstract structure of the language he or she is
writing in much more than the material structure of the machine the program will run on.
Compare this to the image Kelty begins his discussion of source code with, "Alan Turing
purportedly liked to talk to the machine in binary" (Kelty, 2008, p. 121). Kelty gives no source
for this anecdote, and his use of the word purportedly suggests strongly that it may be
apocryphal. Nonetheless, Kelty is an ethnographer, and like any ethnographer he understands
that the stories a community shares have importance, even if they are not literally true. The story
of Alan Turing, father of computer science, directly speaking the binary language of the machine
in the days before the invention of source code reveals a dream of pure, unmediated connection
to the machine. Someone able to speak directly to the machine in this way would be able to
understand the workings of the machine intuitively, to truly have "direct access" to the computer,
unconstrained by the metaphors chosen by language designers.

Even if Alan Turing never spoke in binary, Kelty also gives a perhaps more realistic
example of earlier computer users whose access to the machine was direct and unmediated by
the metaphors of high level language. "Grace Hopper," he writes, "who invented an early
compiler, worked as close to the Harvard Mark I as she could get: flipping switches and plugging
and unplugging relays that made up the “code” of what the machine would do" (Kelty, 2008, p.
121). Thus, the loss of direct access to the machine was both mythological and real. The fact that
Hopper, who coined the term "computer bug" based on the tendency of the Mark I to have its
operations disrupted by actual, material insects getting among its vacuum tubes, would go on to
write an early compiler, suggests the attractiveness of trading direct access for the flexibility and portability of high-level languages for coders. The high-level language may have been one of the first ways that direct access to the machine was traded for greater flexibility, but it would not be the last. The development of computer operating systems, graphical user interfaces, and the internet all continued this trend of making computers more useful and flexible, while at the same time concealing their specific materiality beneath ever more layers of abstraction. This necessary tradeoff has been the source of great power and possibility, it has also been the source of considerable anxiety. As I will show, it was both this power, and this anxiety, that helped to drive the creation of the cyborg individual ideal.

As I've shown, one of the great possibilities source code has offered has been to allow information to take on an ever more contingent relationship to materiality. Because source code, unlike machine code, can be ported from one machine embodiment to another, it allows programs to be relatively easily transferred from one form or hardware to the next. Source code was not, however, the only abstraction that enabled this contingent relationship. Further layers of abstraction, developed beyond and above source code, have allowed information to travel between and among machine bodies even more easily. The Internet is itself one of these layers of abstraction. The researchers who developed the internet were driven by the desire to have information act as if it was disembodied. For example, Katie Hafner, in her *Where Wizards Stay Up Late: The Origins of the Internet* describes the ambitions J.C.R. Licklider, a Defense Department Advanced Research Agency (ARPA) researcher credited with beginning the work that would later lead to the Internet, expressed in a memo to an early computer networking research group, called, in the playful language so often used by early Internet pioneers, "the
Six months after his arrival at ARPA, Lick wrote a lengthy memo to the members of the Intergalactic Network in which he expressed his frustration over the proliferation of disparate programming languages, debugging systems, time sharing system control languages, and documentation schemes. In making the case for an attempt at standardization, Lick discussed the hypothetical problem of a network of computers. 'Consider the situation in which several different centers are netted together, each center being highly individualistic and having its own special language and its own special way of doing things,' he posited. 'Is it not desirable or even necessary for all of the centers to agree upon some language, or, at least, upon some conventions for asking such questions as 'What language do you speak?' (Hafner & Lyon, 1998, p. 38).

Licklider's desire for "conventions" that speakers of disparate technological "languages" could use to communicate with one another would eventually be realized as Internet "protocols," a system of abstractions that allows different computer systems to exchange information regardless of the specifics of their material conditions, or even the programming languages and other local metaphors a particular system uses to present itself. In the quote above Licklider stresses the way that these conventions would bridge the gap between different "languages," or symbolic systems, but Hafner's history makes clear that the desire to develop these conventions was also driven by the need to bridge the gap between materially different computers. She writes that the Defense Department, which funded the development of the early Internet, was "faced with a federal rule dictating that all [computer] manufacturers be given equal opportunity," and that this resulted in
"the purchase of a whole variety of machines" (Hafner & Lyon, 1998, p. 42). By developing this set of abstractions, the Internet would allow the research centers employed by the Department of Defense, and later computer users in general, to transfer information to one another as if it were disembodied.

In the last years of the twentieth century, young hackers would inhabit the environment that the builders of both source code and the Internet helped construct. They would build on these abstractions, and the apparently disembodied information they enabled, while at the same time being shaped by desires and anxieties created by these very same abstractions. Some twenty-two years after the first nodes of the Internet were deployed, in the winter of 1991, Linus Torvalds, then a young Finnish college student and computer enthusiast, purchased a then state of the art Personal Computer, a no-name IBM clone equipped with a blazing fast Intel 80386 processor (running at the astounding speed of 33 megahertz) and four megabytes of RAM. His experiences with that computer reveal the ways in which hackers like Torvalds were responding to both the anxieties and desires specific to their particular embodiment, an embodiment that featured distributed, individually owned computers capable of interacting with abstract constructions that made information act “disembodied.”

Torvalds’ account of his early experiments with his PC, given in Just for Fun, suggests that two desires drove his interactions with this new computing device, interactions that would eventually lead to the GNU/Linux operating system, a key part of the FOSS movement that would later inspire Wikipedia. First, Torvalds’ childhood experiments with a previous computer, a Sinclair QL, demonstrate his desire for low-level mastery of the machine, his desire to exercise the "hands on imperative." He explains that was unhappy with the driver (a driver is a piece of
software that enables a particular piece of hardware to interface with the operating system) that the manufacturer supplied with an optional floppy drive he purchased. In the process of writing his own replacement driver, he "found some bugs in the operating system - or at least a discrepancy between what the documentation said the operating system would do and what it actually did" (Torvalds, 2001, p. 44). To resolve this difficulty Torvalds, "went in and disassembled the operating system" (Torvalds, 2001, p. 44).

Ultimately, Torvalds' efforts to modify and master the Sinclair were frustrated by the fact that it stored important pieces of its operating system in Read Only Memory (or ROM) making it physically, materially impossible for him to alter them. It is hardly surprising, then, that one of the first things Torvalds did upon obtaining his new PC was to install Minix, a version of the widely used Unix operating system ported to the PC by computer science professor Andrew Tanenbaum. Unlike the Sinclair's operating system, which had been irrevocably tied to a particular form of materiality by virtue of being frozen into ROM, Unix was already the very model of disembodied software, having been ported to a wide variety of different platforms by academics and corporations alike. More importantly to Torvalds, it was a "clean and beautiful operating system" (Torvalds, 2001, p. 54). For Torvalds an operating system’s “cleanliness” and “beauty” were intimately connected to the ease with which it allowed a virtuoso hacker, like himself, to develop mastery over his machine.

Minix gave Torvalds more than just an opportunity to master his local machine, however, it also gave him the opportunity to connect to the much larger world of information that was the Internet. It was Torvalds’ desire to connect to this larger world that would spur his development of Linux. As he quickly outgrew the limitations of his stock Minix system, which had been
designed as a teaching aid and thus lacked certain advanced features, Torvalds "tried to compensate for [Minix's] shortcomings by downloading programs that I had gotten used to from the university computer [which also ran Unix]" (Torvalds, 2001, p. 61). Torvalds' ability to connect to this larger world of information was frustrated by what he saw as the failures of the "terminal emulation" feature offered by Minix. Terminal emulation refers to a piece of software that allows a computer to mimic, or emulate, the function of a mainframe terminal, which was a dedicated piece of machinery that allowed a user to access a mainframe computer remotely. In other words, a terminal emulator, allows a computer to perform a sort of drag act, enacting in software a form of materiality different from the one embodied in its hardware. Torvalds needed terminal emulation, "to dial up the university's computer to either work on the powerful Unix computer or just go online" (Torvalds, 2001, p. 62). To overcome his difficulties with the stock Minix terminal emulator and allow information to flow more easily between his PC and the larger internet, Torvalds decided to write his own terminal software. In addition, Torvalds decided to write his terminal program "at the bare hardware level," writing code that would talk directly to the hardware of his computer, without the intervening metaphors of the Minix operating system. Such a project would "be a great opportunity to learn how the 386 hardware worked" (Torvalds and Diamond, 2001, p. 62). It would be both an opportunity to exercise machine mastery, to directly connect to the computing machinery he owned, and an opportunity to make information act as if it was disembodied.

By the spring of 1991, Torvalds had his terminal program working. He was able to use it to "log onto the university computer and read email or participate in the discussions on the Minix newsgroup" (Torvalds, 2001, p. 77). At this point, Torvalds’ emulator could successfully
negotiate the protocols needed to exchange information with the university mainframe, materially both different and distant, making this information seem disembodied. However, Torvalds' connection to the larger world of information was still imperfect. The software did not yet allow him to download or upload files, that is to say, to transfer copies of information stored on his disk drive to and from the remote computers his terminal emulator connected him to. In order to enable this ability, Torvalds' terminal, "would require a disk driver. It also needed to get a file system driver, so that it would be able to look at the organization of the disk and save the stuff I was downloading as files" (Torvalds, 2001, p. 77). Writing these two drivers, Torvalds tells us, was a complex and difficult task. Ultimately, the program Torvalds produced exceeded his initial expectations. He writes, "one moment I'm in my threadbare robe hacking away at a terminal emulator with extra functions. The next moment I realize it's accumulating so many functions it has metamorphosed into a new operating system in the works" (Torvalds, 2001, p. 78). This was the embryo of GNU/Linux, the operating system that today powers everything from Google's server farms to hobbyist attempts to plug Nintendos into Sonys. Torvald's operating system kernel, the heart of the FOSS movement and of much of our contemporary information infrastructure, emerges out of the twin desires for machine mastery and access to disembodied information.

In building the GNU/Linux operating system Torvalds, and later his thousands of collaborators, drew on the tremendous resources provided by the tools earlier generations of computer users had constructed to abstract information away from any one particular material form, to allow information to act as if it were disembodied. Early in the process, Torvalds wrote the Minix newsgroup asking for help finding a copy of "the posix standard definition" (Torvalds,
The POSIX standards, he explains, "are the lengthy rules for each of the system calls in Unix," and they are important because they allow "programmers to be able to write applications to the operating system and have them run on more than one version" (Torvalds, 2001, p. 79). Torvalds could have written his operating system without POSIX, but by conforming to these standards he connected Linux to the larger world of Unix software. In a now famous post to the comp.os.minix usenet group in August of 1991, Torvalds announced his new operating system:

From: torvalds@klaava.Helsinki.FI (Linus Benedict Torvalds)

Newsgroups: comp.os.minix

Subject: What would you like to see most in minix?

Summary: small poll for my new operating system


Date: 25 Aug 91 20:57:08 GMT

Organization: University of Helsinki

Hello everybody out there using minix -

I'm doing a (free) operating system (just a hobby, won't be big and professional like gnu) for 386(486) AT clones. This has been brewing since april, and is starting to get ready. I'd like any feedback on things people like/dislike in minix, as my OS resembles it somewhat (same physical layout of the file-system (due to practical reasons) among other things).

I've currently ported bash(1.08) and gcc(1.40), and things seem to work. This
implies that I'll get something practical within a few months, and I'd like to know what features most people would want. Any suggestions are welcome, but I won't promise I'll implement them :-) 

Linus (torvalds@kruuna.helsinki.fi)

PS. Yes - it's free of any minix code, and it has a multi-threaded fs. It is NOT protable [sic] (uses 386 task switching etc), and it probably never will support anything other than AT-harddisks, as that's all I have :-(.

There are several features of this post worth pointing out. First Torvalds demonstrates that he has reaped the benefits of following the POSIX standards, which have allowed him to transfer two pieces of Unix software developed by Stallman's GNU project to his new operating system. These two programs were Bash, which provides what is known as "system shell" a very basic computer interface, and GCC, which is a compiler for the high-level language C. Second, Torvalds claims that Linux is "not portable" by virtue of the fact that it uses features specific to the particular computer hardware Torvalds had written it on, such as "386 task switching." In other words, Linux is at this point firmly tied to a particular material form, the IBM PC clone based around the Intel 80386 chip.

This tie does not last long. In Just for Fun Torvalds quotes an early response to his post, which asked, "how much of it is [written in the high level language] C? What difficulties will there be in porting? Nobody will believe you about non-portability ;-), and I for one would like to port it to my Amiga" (Torvalds, 2001, p. 86). This poster demonstrates both the desire of the early Linux community to break the operating system free of its hardware, porting it to other
systems, and how the ability of the community to break Linux free of its materiality was enabled by the fact that the operating system was written in a high level language. Just as important, Torvalds decided to license the source code of his operating system under the GPL, ensuring that it would remain free for others to modify.

By doing so, Torvalds changed the landscape of disembodied information, freeing the Linux operating system not only of technical, but also legal restraints. This greatly expanded the realm of disembodied information, building on the earlier work of the creators of source code and the internet to further construct and environment in which information could “act disembodied.” With access to a both technically and legally free Linux, enthusiasts could "port" Linux to their particular machine, and the fact that Linux conformed to the POSIX standard allowed them to run the wide universe of programs written for Unix. Thus the abstract tools of high level languages, operating systems, and internet protocols, along with the legal freedom permitted by the GPL, enabled GNU/Linux hackers, then and now, to participate in a world in which information acted as if it was disembodied. A world they richly desired. In doing so, they laid the groundwork for the ideal body of the cyborg individual. When the Wikipedia project began, it hoped to allow other forms of information, beyond software, to act disembodied. However, before we can understand the consequences of that, first we must understand the attendant anxieties that came along with the process of abstraction that created apparently disembodied information. In important ways, the cyborg individual ideal grew out of hackers' need to respond to these anxieties.

**Cyborg Anxieties**

The creation of both distributed, individually owned general purpose computers and the
tools that enabled information to act as if it was disembodied were also linked to deep anxieties for some programmers. We must understand these anxieties to fully understand the consequences of the historical construction of apparently disembodied information, and the cyborg individual ideal that was constructed along with it. Coder Ellen Ullman’s memoir, *Close to the Machine*, gives us one window into some of these anxieties. In one scene from the book, Ullman shares a sentimental artifact, a "small, white, spiral bound book" containing the UNIX system three documentation with a much younger lover. "In here," she tells him, "was the entire UNIX operating system [...] all of it, top to bottom" (Ullman, 1997, p. 113). Her lover, who was never involved in this era of UNIX, has little patience with Ullman’s sentimentality with this obsolete book, telling her to "throw it away." Ullman, in turn, tries to explain her connection to the old manual. In the era in which it was written, she explains, the manual enabled the reader to gain almost perfect mastery of the machine. It contained, "everything about the system environment [...] System Calls. Commands. Network Interface. Input Devices. File System" (Ullman, 1997, p. 114). In other words, the manual was a sort of complete vocabulary that promised to teach the reader how to speak to the machine using the metaphors established by the designers of Unix. In a sense, it restores to the programmer the mastery she had lost when the era of Turing speaking binary and Hopper directly wiring the Mark I had ended, and the internal workings of the computer were masked behind layers of mediation.

As Ullman’s nostalgia makes clear, however, by the last decade of the 20th century this renewed mastery had been lost in turn. She goes on to ask to her counterpart, "don’t you think its bizarre that now I could fill this room with manuals, read every one of them, and still not understand the UNIX operating environment? Don’t you think it means something about what’s
happening to our profession?” (Ullman, 1997, pp. 114-115). Ullman's sense of mastery is being swamped by the proliferation of ever larger and more complex machine environments. Part of the reason for this dazzling complexity may be the rapid evolution of computer hardware, Ullman lists several obsolete pieces of hardware she has parted with over the years, but her account stresses the even faster rate of change of computer software. The metaphors of source code and its related constructions, now abstracted free from the material machines that they exist on, mutate and grow at dazzling speed. Ullman demonstrates this rapid change and how overwhelming it is for a professional programmer trying to keep up with it by describing the update disks sent to her by Microsoft for their products:

> Quarterly, seasonally, monthly, whenever - with an odd and relentless periodicity - UPS shows up at my door with a new stack of disks. New versions of operating systems, database software, developer libraries, development tools, device driver kits - everything you need to know to keep pace with Microsoft. The disks are barely loaded before I turn around and UPS is back again: a new stack of disks, another load of newness” (Ullman, 1997, p. 103).

She writes that this relentless "newness," which she had once found exhilarating, is now exhausting. Losing this desire for the new, she explains, is incompatible with a her career as a programmer, as it means "watching the great, cutting, spinning edge slice away from me" (Ullman, 1997, p. 105). To be overwhelmed by the sprawling complexity means losing her hold on her craft; it means losing her job.

Ullman's narrative suggests that the possibility of unemployment may not be the only thing driving her anxiety about the ever-accelerating pace of software development. In a scene
early in the book, Ullman expresses both the sense of pride and the fear of erasure that she experiences as a programmer. She describes an encounter with a high-level executive at a Napa valley wine tasting party. Reflecting on the vague managerial language the woman uses to describe the activities of the technology firm she oversees, Ullman muses "She got paid to talk this way. 'Corporate users,' I thought. They live where software edges into business. Corporate end users: wildebeests of the programming food chain, consumers, roaming perilously far from the machine" (Ullman, 1997, p. 17). Ullman is here expressing a sense of coder pride by depicting programmers as, like Marx's proletariat, able to derive power from being in direct contact with the actual means of production, being close to the machine. This closeness means that they understand the productive mechanisms in ways that those who nominally own and command them do not, rendering owners and managers mere "wildebeest." Yet, by the end of the short scene, Ullman's pride has been deflated. She describes her envy of the manager's ability to "hide her feelings," preventing Ullman from sensing the manager's fears or doubts. "Then I remembered," Ullman writes, "that she probably had no fears or doubts about me. All she knew about me is what I'd told her: that I'm a software engineer. I'm no one" (Ullman, 1997, p. 21). Despite her pride, Ullman here feels that her closeness to the machine can also be a liability, erasing her as a person.

Ullman's fear and pride may both be linked by the liminal position she occupies as a programmer, caught between two kinds of "user." On one hand, there are the "corporate end users" above, the owners of machines and software both, who alienate her from her labor and bury her under endless iterations of constantly mutating software. On the other hand are the real, human (as opposed to corporate) "users" of computers. Ullman explains the complex relationship
these users have to the computer software that they use. On one hand, Ullman points out the sophisticated ways in which users are able to make machines work in ways that meet their own needs. She writes that users are able to master complex tools like spreadsheets: "when users want to show me the sort of information they have been storing, they open elaborate, intricate spreadsheets full of lists and macros and mathematical formulas, links to databases, mail merge programs, and word processors. They have, in effect, been programming. I am amazed at the ingenuity shown in putting together these many tools. I am astounded at the complexity managed so deftly by these 'naive' end users" (Ullman, 1997, p. 77). Even without a low-level mastery of the machine behind the metaphors, Ullman's passage suggests, users can and do make sense of the abstractions they encounter in ways that work for them. At the same time, however, Ullman is acutely aware of how user's activities may be shaped by the metaphors presented to them in computer interfaces. She writes that the web of the late 1990s "represents the ultimate dumbing down of the computer" (Ullman, 1997, p. 77). Whereas with the spreadsheet, "it is the end user who creates information, who gives form to data, who informs the spreadsheet," Ullman believes that on the Internet, "the relationship between person and machine is completely reversed [...]. The Net is the knowledge library, and the user can only search it" (Ullman, 1997, p. 78). While today's Internet no longer behaves the way that Ullman describes, in no small part because of sites like Wikipedia itself, her observations here still allow us to see her anxiety about how the behavior of users could be shaped by the interfaces, the metaphors, that corporations designed and programmers developed.

Another anecdote makes clear Ullman's concern that users may be controlled by the machines they interact with. Early in her career, she writes, she installed software in the offices
of a "small business in central California" (Ullman, 1997, p. 85). At a dinner meeting after the system was installed, the owner of the business asked Ullman if she could modify the software to "keep a record of every key someone enters [on the computer]" (Ullman, 1997, p. 86). He tells Ullman that he wants to modify the software in this way to keep track of his employees; he'd "like to know everything [his receptionist] Mary does in a day" (Ullman, 1997, p. 87). When Ullman protests, arguing against installation of the keylogger, the owner tells her simply, "the way I look at it, I've just spent all this money on a system, and now I get to use it the way I'd like to" (Ullman, 1997, p. 87). The behavior of this business owner, Ullman tells us, is repeated by other clients. To become a user, then, is to risk being exposed to panoptic surveillance and unaccountable power. To lose one's mastery over the computer is to be dominated by distant forces. Is it any wonder, then, that Ullman worries about drifting too far from the machine?

It is here that Free/Open Source Software re-enters the picture. As discussed briefly above, by promising to make the software's source code available, FOSS promises programmers that they will be able to retain mastery over their machines. The anxieties about losing control first opened up by the intervention of source code between the programmer and the machine he or she worked on are partially assuaged. Even if their control over the machine cannot be complete, FOSS serves to reassure programmers that they will not become users, dominated by machines rather than dominating them. In his "GNU Manifesto," Free Software pioneer Richard Stallman goes on at length about how he hopes that Free Software will foster "community," but he also hints at how his project might aid those seeking individual machine mastery. Free Software, he writes, will enable:

[...] any user who needs changes in the system will always be free to make them
himself, or hire any available programmer or company to make the changes for him. Users will no longer be at the mercy of one programmer or company which owns the sources and is in the sole position to make changes" (Stallman, 2002, p. 34).

In a later essay, Stallman rails against the "Trusted Computing Initiative," which would have required personal computers to include special encryption hardware to police "intellectual property." Stallman begins his essay by asking the reader, "Who should your computer take its orders from?" (Stallman, 2002, p. 34). stressing the reader's presumed ownership over his or her computer, and the assumption that the owner of a computer should legitimately expect to control his or her machine. In this way, Stallman's essay demonstrates how FOSS trades one form or property against another. FOSS uses the expectation of computer owners to control one form of property, their physical computers, as justification for loosening another form of property, the intellectual property rights that software owners claim over the metaphors that users need to interact with those computers.

Thus we can see how FOSS reflects the ideal body of the cyborg individual introduced at the beginning of this chapter, and demonstrates how this ideal body serves to assuage the anxieties of computer professionals. FOSS upholds the values of the cyborg individual. By making software non-property, FOSS privileges the ability of individual computer owners to control their machines, free from domination by distant software owners. In doing so, FOSS attempts to imagine an egalitarian network of cooperating users, free from any centralized domination. All of this is ensured by the tight coupling of broadly distributed general purpose computers, like the IBM PC Torvalds used to develop the initial Linux kernel, and the ability of
these broadly distributed computers to access a wider world of information that acts as if it is disembodied.

This vision of an egalitarian community free from domination has served FOSS well, and made it an attractive model of a possible new mode of production. Indeed, this same vision played an important role in the founding of Wikipedia. However, the cyborg individualist ideals they are based on may also weaken communities like FOSS and Wikipedia in important ways. First, the cyborg individual ideal assumes that general purpose computing devices will remain broadly distributed simply because, as Benkler puts it,

[…] it is cheaper to build freestanding computers that enable their owners to use a wide and dynamically changing range of information applications, and that are cheap enough that each machine is owned by an individual user or household, than it is to build massive supercomputers with incredibly high-speed communications to yet-cheaper terminals” (Benkler, 2004, p. 99).

This assumption overlooks the specific historical construction of the personal computer, and reinforces the notion that individual machine mastery can and should be the basis of an egalitarian network. Furthermore, as we will see in the next chapter, current trends suggest that small, individually owned computing devices are no longer as central to the contemporary Internet as they were when Benkler wrote the sentence above. Instead, recent years have witnessed the rise of large, centralized “information utilities,” and these utilities have played an increasingly important role in Wikipedia, among other things. The desire to live up to the cyborg individual ideal of mastery over one's own machine may have blinded some to the way the embodiment of information was changing.
Finally, in constructing the ideal body of the cyborg individual programmers also constructed an "Other," a figure they could define themselves in contrast to. This Other is the "user." In contrast to the cyborg individual, who dominates his or her machine and is free, the user is dominated by the machine, and thus enslaved. This othering of those who do not display technical mastery may serve to blind communities shaped by the cyborg individualist ideal to the possibilities of building meaningful connections with those outside of a narrow range of technical proficiency. This inward looking tendency, this desire for technically competent communities to only look out for their own interests, may also play a role in Wikipedia.
CHAPTER FOUR – THE EMBODIMENT AND POLITICAL ECONOMY OF WIKIPEDIA

In the last chapter, I demonstrated how hacker culture, and specifically the hackers of the FOSS movement, came to embrace an ideal body I called "the cyborg individual." Wikipedia inherited a great deal from the FOSS movement, including this ideal. This inheritance has affected both Wikipedia editors themselves, and those writing about the Wikipedia phenomenon. It has been both a boon to Wikipedia, and a liability. In this chapter I will demonstrate several concrete ways in which the cyborg individual ideal has shaped Wikipedia, and our larger understanding of the significance of the Wikipedia phenomenon.

To accomplish this, I perform several tasks. First, I establish how Richard Stallman's very early calls for and internet encyclopedia, which served as a foundational document for Wikipedia, invoked the cyborg individual ideal. Stallman believed that the decentralized nature of the cyborg individual embodiment would ensure the internet encyclopedia remained Free. I then move on to demonstrate how Yochai Benkler, whose 2006 book Wealth of Networks did important work in establishing that peer production was a viable method beyond the world of FOSS, had an understanding of Wikipedia which was also influenced by the cyborg individual ideal. Most importantly, I demonstrate that Benkler argues that the tight coupling of individually owned computing devices to individual human subjects will allow peer production to draw off the diversity of individual motivations to create a more diverse, and just, information environment.

In the second half of this chapter, I will show that how Wikipedia's example demonstrates that Benkler's understanding of peer production, while still valuable, may be flawed in important

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9 I capitalize “Free” where I use it to refer specifically to the heritage of the Free Software movement
ways. I do this by demonstrating the historical process by which Wikipedia came to inhabit not a decentralized technological embodiment, but rather a highly centralized one. I do this by tracing how Wikipedia mirrors, sites which duplicate Wikipedia content, and forks, which attempt to duplicate the encyclopedia project itself, have developed. The actions of Wikipedia editors and others have served to marginalize these potentially decentralizing forces. Furthermore, I demonstrate Wikipedia's history demonstrates how the Wikipedia community has been shaped and bounded. By developing an understanding of Wikipedia that stresses collective action and shared resources, rather than individuals commanding privately owned resources, I believe we can do a better job of explaining how Wikipedia actually functions. I show that Wikipedia editors were able to use the threat of forking, or splitting, the project as a means to express their collective will. At the end of the chapter I demonstrate how the collective needs of Wikipedia's labor pool have shaped site policies, especially the NPOV, further influencing site content.


A variety of sources demonstrate Wikipedia's intellectual debt to FOSS. In a 2008 interview with the New Yorker project co-founder Jimmy Wales said that Eric S. Raymond's The Cathedral and the Bazaar, "opened my eyes to the possibility of mass collaboration"(Schiff, 2008). Wales often cites Raymond in early posts to mailing lists associated with Wikipedia and other free encyclopedia projects. For example, in a January 18, 2001 post to the GNUpedia (an attempt by Richard Stallman's GNU foundation to create a free encyclopedia) list, Wales writes that problems that project was having negotiating between openness and centralized control were, "In ESR's terminology, [...] a tension between the cathedral and the bazaar"(Wales, 2001c).
Raymond, for his part, has not always been enthusiastic about how Wikipedia has attempted to appropriate his ideas about writing software for the purpose of authoring and encyclopedia. The same *New Yorker* article goes on to quote Raymond as saying, “‘disaster’ is not too strong a word” for Wikipedia, before going on to say that Raymond, “believes that the open-source model is simply inapplicable to an encyclopedia. For software, there is an objective standard: either it works or it doesn’t. There is no such test for truth” (Schiff, 2008).

Richard Stallman, on the other hand, was an early and vocal advocate of applying the principles of Free software to the project of building an encyclopedia. As early as 1999, video evidence suggests Stallman was discussing the idea that, “the world wide web should become the free encyclopedia of all knowledge,” at conventions (Internet and Web Pioneers, 2006). In December of 2000, Stallman posted his call for the creation of, “A Free Universal Encyclopedia and Learning Resource,” to the website of the GNU foundation (“Stallman's proposal for free encyclopedia,” 2000). In this document, Stallman both described his vision for a Free encyclopedia, and outlined the requirements that he felt an encyclopedia project would have to meet in order to be truly "Free." Stallman's call for such a resource would later be answered by a variety of projects, including the short-lived GNUpedia, as well as Wikipedia and its predecessor Nupedia. Stallman ultimately would become involved in convincing Wales to license Nupedia, and later Wikipedia, under the GNU FDL (Free Documentation License). Stallman's endorsement of the GFDL licensed Nupedia, and later Wikipedia, would play a key role in the success of the Wikipedia project.

Thus, Stallman's call for a Free encyclopedia can be seen as a foundational document for Wikipedia, and one that bears further scrutiny if we want to uncover the understanding that
Stallman, and perhaps others, had of what such a Free resource would ultimately look like. The vision of a Free encyclopedia presented by Stallman differs from Wikipedia as we observe it today in important ways, ways that reflect the influence of the ideal of the Cyborg Individual on Stallman's thinking. Like the hackers, OLPC developers, and others discussed in the last chapter, Stallman's proposal imagines a distributed network of small, individually owned computers playing host to the Free encyclopedia. He writes that the Free encyclopedia will be “An encyclopedia located everywhere,” which will, “be developed in a decentralized manner by thousands of contributors, each independently writing articles and posting them on various web servers” (“Stallman's proposal for free encyclopedia,” 2000). Like the OLPC project, which designed its laptops to be individually owned by children in an attempt to guarantee an egalitarian social order, Stallman argues that a decentralized embodiment for the Free encyclopedia would guarantee that, “no one organization will be in charge, because such centralization would be incompatible with decentralized progress” (“Stallman's proposal for free encyclopedia,” 2000).

Like the early Linux hackers described in the last chapter, who wanted to “port” their new operating system to a wide variety of computers, Stallman foresees his Free encyclopedia as being easily transferable among a wide variety of different hosts. This can be most readily seen the reasoning he gives for his requirement that any Free encyclopedia permit what are known as “mirror sites,” or sites duplicating the content of the original project. Stallman clearly believes that such sites are important, writing that they are needed since, “when information is available on the web only at one site, its availability is vulnerable. A local problem [...] could cut off access for everyone forever” (“Stallman's proposal for free encyclopedia,” 2000). Stallman argues that
mirror sites are needed to ensure that access to information is not lost. However, he recommends against taking any positive action to establish such mirror sites, writing that, “there is no need to set up an organization or a bureaucracy to do this” (“Stallman's proposal for free encyclopedia,” 2000). Instead, Stallman suggests that since, “Internet users like to set up 'mirror sites' which hold duplicate copies of interesting web pages,” it is sufficient to ensure that they have the legal right to do so, and mirror sites will take care of themselves. In this, we see how Stallman views the information of the Free encyclopedia as fundamentally immaterial, able to flow from one form of embodiment to another so long as the law does not get in the way.

Some users of the early Wikipedia had even more radical plans to transfer the information of Wikipedia to a variety of material bodies. Jimmy Wales, for his part, announces in January of 2001 that his vision for the Nupedia project includes the eventual creation of printed editions, which will be, “printed up by private companies, at the competitive price of the cost of paper, with no licensing fees of any kind, and distributed even to remote villages too poor to have electricity or clean water” (Wales, 2001g). This vision of a version of the Free encyclopedia for distribution to those without Internet access would eventually become the Wikipedia CD selection project (“Wikipedia:Wikipedia CD Selection - Wikipedia, the free encyclopedia,” n.d.). Other early Wikipedians envisioned Wikipedia content being included as a part of the Linux operating system (which would have encouraged users to install the documents locally, to their own machines) (Merrill, 2001) or as static HTML files for local viewing, or to burn to CD (Boldt, 2001b). Some even imagined creating a radically distributed platform that would host Wikipedia content across a large number of individually-owned machines, rather than on a central server (Jasiutowicz, 2001a).
An early version of the Wikipedia FAQ makes explicit the link between the GFDL’s removal of legal barriers on copying Wikipedia information, and the perceived likelihood of that this information would quickly and easily flow to a variety of different physical forms. One apparently user-submitted question asks, “What legalities must be considered in creating conventional printed snapshots of Wikipedia? Are there any plans for any?” and is answered:

The full answer to the first question will be found at GNU Free Documentation License. Re the second question: No specific plans on the part of Bomis yet, anyway (there has been vague talk and long-term dreams)—that doesn’t mean someone else couldn’t do it, even right now. This is open content, after all (“Wikipedia FAQ - Wikipedia,” 2001).

Another question asks, “Can I mirror entire sections of the Wikipeda to my site? (Perhaps edited a bit) How much can I quote?” and is answered, “You may mirror or quote as much as you wish, as long as you maintain the text under the GNU Free Documentation License. Don’t do this if you’re writing a paper for school, though!” (“Wikipedia FAQ - Wikipedia,” 2001).

In all of these cases, we see that early Wikipedia users believe that the freedom granted by the GFDL, which ensured there would be no legal limitation on reproducing information posted to Wikipedia, means that information from Wikipedia will automatically be treated in a way that renders its material body unimportant. Free from any legal connection to any single physical body, early Wikipedians often assume that Wikipedia will take on a radically decentralized form, with information from Wikipedia spread widely across different mirror sites, small websites, printed editions, and the documentation files of individual computers.
In Fork We Trust: Benkler’s Belief in the Cyborg Individual as Guarantee of Media Diversity

At least one early Wikipedian sees the possibility of Wikipedia data flowing to other physical bodies as a way to ensure that the project would not be controlled by Jimmy Wales’ search engine company Bomis, which at the time provided hosting for the site. During an August 2001 debate on the Wikipedia-L about the need for Bomis to provide easily downloadable versions of Wikipedia’s content users could use to (relatively) easily copy the site, one Wikipedian writes that such a copy might become necessary if a future action by Bomis “hampers the growth or endangers the freedom” (Jasiutowicz, 2001b). For this user, the ability of Wikipedia’s information to escape any one form of embodiment also means that it may escape domination by any single interest, including Bomis. If such domination should become imminent, he proposes, users should simply replicate the project somewhere else, outside of Bomis’s reach.

This process of migrating a project to escape domination by a person or entity is known as “forking,” and has a long history in the FOSS community. Political economist Steven Weber writes that forking ensures that FOSS coders will not be alienated from the products of their labor. He writes:

An individual whose code patch gets rejected always has a clear alternative path. He can take the core code, incorporate the patch, set the package up as a "new" open source project, and invite others to leave the main project and join his. This is called "forking the code base" or simply "forking." Open source guarantees this
right - in fact, some developers believe that the essential freedom of free software is precisely the right to fork the code at any time (Weber, 2004, p. 64).

Weber uses the language of computer programming to describe the relationship between individual FOSS coders and the leadership of the projects they participate in. When he writes that "an individual whose code patch gets rejected," can resort to forking, he is, in more general terms, describing the ability of the coder to avoid having his or her ideas about the future of the project ignored. By forking, Weber suggests, such a coder can create a new version of the project that adheres to his or her unique vision. Forking, then, is seen as a mechanism for allowing diverse interests to have their say in the FOSS community, by providing dissenting voices from one project to start projects of their own.

The example of an early Wikipedian discussing the possibility of forking Wikipedia if the project were to stray from his ideals of growth and freedom suggests he believes that this ideal of the fork might be a mechanism for ensuring diversity in information sources such as Wikipedia as well. This is a notion that has been advanced by theorists, as well as practitioners, of peer production. Indeed, Yochai Benkler, in the 2006 book that coined the term “peer production,” Wealth of Networks, makes the argument that an environment of decentralized ownership of the means of information production coupled with information able to flow freely between different sites and forms of embodiment will lead to diversity, not only in software production, but in the production of all forms of information. Benkler's influential argument has been an important lens through which the phenomenon of Wikipedia has been read, and it is important that we understand how the cyborg individual ideal has shaped this lens.

The ideal environment for information production, as described by Benkler, resembles the
ideal of the cyborg individual. First, Benkler argues for the importance of small, individually owned computing devices. Benkler writes that the contemporary political economy of information production is being transformed by "ubiquitously available cheap processors," which have, "drastically reduced the capital input costs required to fix information and cultural expressions, and communicate them globally" (Benkler, 2006, p. 52). Second, he imagines these computing devices linked in an egalitarian network, at one point even advocating for the same sort of radically decentralized wireless mesh network OLPC wanted its users to employ to connect their XO laptops to one another (Benkler, 2006, p. 87). Benkler argues that both of these material conditions are the result of:

[…] a felicitous happenstance of the fabrication technology of computing machines in the last quarter of the twentieth century, and, it seems, in the reasonably foreseeable future. It is cheaper to build freestanding computers that enable their owners to use a wide and dynamically changing range of applications, and that are cheap enough that each machine is owned by an individual user or household, than it is to build massive supercomputers with incredibly high-speed communications to yet cheaper simple terminals, and to sell information services to individuals on an on-demand or standardized package model (Benkler, 2006, p. 99).

As the quote above shows, Benkler sees the emergence of the material conditions of the cyborg individual as an accidental outgrowth of capitalism's drive for ever greater efficiency, a side-effect of lowest-cost production, rather than an intentional move for greater freedom and information diversity.
Finally, consistent with the implied support for capitalist economy in the manufacture of the material basis of information production seen above, Benkler draws a sharp line between the immaterial realm of information, where he believes that loosely linked collaborations between cyborg individuals can be economically important, and the realm of material goods, where he argues traditional capitalist forms of organization remain appropriate. He writes, "there are no noncommercial automobile manufacturers. There are no volunteer steel foundries," (Benkler, 2006, p. 35) before going on to explain how noncommercial and volunteer organizations have a long history of playing an important role in information production, giving BBC and National Public Radio as examples. For Benkler, the emergence of the cyborg individual represents a way to accomplish noncommercial information production without the use of the centralizing (and possibly dominating) mechanism of the state. Instead, loosely organized groups of volunteers can form affinity networks to pool their efforts on a voluntary basis.

Benkler believes that ensuring we maintain an environment where these sorts of affinity networks, which he calls "peer production" or "social production," can thrive will have a real impact on political freedom and social justice. Most of the benefits Benkler imagines as arising from peer production, from greater research into pharmaceuticals for diseases afflicting the poor (Benkler, 2006, p. 310) to increased "individual autonomy" (Benkler, 2006, p. 133) flow from his belief that peer production will liberate individuals to produce diverse information based on diverse desires and motivations. In an early example, Benkler discusses the results of a Google search for the term "viking ships." Such a search, he argues, demonstrates the diversity of sources available on the web, and the diverse individual motivations that drove their creation:

The first site is Canadian, and includes a collection of resources, essays, and
worksheets. An enterprising elementary school teacher at the Gander Academy in Newfoundland seems to have put these together. [...] The second link is to a Norwegian site called "the Viking Network," a Web ring dedicated to preparing and hosting short essays on Vikings. It includes brief essays, maps, and external links, such as one to an article in Scientific American. [...] The third site is maintained by a Danish commercial photographer, and hosted in Copenhagen, in a portion dedicated to photographs of archeological finds and replicas of Danish Viking ships. A retired professor from the University of Pittsburgh runs the fourth. The fifth is somewhere between a hobby and a showcase for the services of an individual, independent Web publisher offering publishing-related services. The sixth and seventh are museums, in Norway and Virginia, respectively. The eighth is the Web site of a hobbyists' group dedicated to building Viking Ship replicas. The ninth includes classroom materials and teaching guides made freely available on the Internet by PBS, the American Public Broadcasting Service (Benkler, 2006, pp. 53-54).

Unlike the commercial mass-media of the mid-20th century, Benkler argues, peer production by loosely organized cyborg individuals will allow for diverse content. In part, he argues that this is because the broadly distributed physical infrastructure will liberate individuals to produce for non-monetary reasons, without the interference of others.

As long as capitalization and ownership of the physical capital base of this economy remain widely distributed and as long as regulatory policy does not make information inputs artificially expensive, individuals will be able to deploy
their own creativity, wisdom, conversational capacities, and connected computers, both independently and in loose interdependent cooperation with others, to create a substantial portion of the information environment we occupy. Moreover, we will be able to do so for whatever reason we choose--through markets or firms to feed and clothe ourselves, or through social relations and open communication with others, to give our lives meaning and context (Benkler, 2006, p. 107).

Benkler goes on to cite Wikipedia as one example of how individuals can come together to produce a large, complex informational product, without the coercive, centralizing forces of the firm or state. For Benkler, conflating the individually owned, or small group owned, servers that embody the websites making up the search results for "viking ships," and the communally owned resources that embody Wikipedia is not a problem since, in both cases, individuals have the technical resources required to contribute information to the larger project at their disposal. Benkler uses the example of the Wikipedia page on Mattel's Barbie doll to demonstrate how peer production provides a greater diversity of content than most commercial sources. Most commercial encyclopedias, Benkler writes, provide only scant coverage of Barbie, coverage that focuses on the doll's most basic characteristics. Even the special purpose American Studies encyclopedia provided by Grolier's Online focuses on "the number of dolls sold and their value," and provides little critique of or context for Barbie, merely "opaque references to Barbie's physique and her emphasis on consumption" (Benkler, 2006, p. 288).

Only Wikipedia and the encyclopedia Britannica, Benkler writes, "focus explicitly on Barbie's cultural meaning"(Benkler, 2006, p. 288). He highlights the very different means that Wikipedia and Britannica use to achieve this end. Britannica employs the (presumably quite

In the case of Wikipedia, the Barbie article was authored by a variety of small contributions from loosely coordinated individual volunteers. One posted the initial article, which included “only a brief reference to a change in Barbie's waistline as a result of efforts by parents and anorexia groups concerned with the doll's impact on girls' nutrition,” while another, “introduced a fairly roughly written section that emphasized both the body image concerns and the consumerism concerns with Barbie,” and yet another, “rewrote the section, reorganized the paragraphs so that the critique of Barbie's emphasis on high consumption was separated from the emphasis on Barbie's body dimensions” (Benkler, 2006, pp. 288-289). Benkler argues that, by allowing individuals to independently add to its description of Barbie for their own purposes, Wikipedia creates a "social conversation" around the topic that inherently gives us a more diverse source of information than commercial culture, which he suggests has been dominated by large corporations producing "communication about the material characteristics or qualities of the products or services sold by advertisers" (Benkler, 2006, 289).

However, Benkler's faith in individuals empowered by the technology they own and the diverse motivations of these individuals as a guarantee of media diversity may overlook the important ways in which the shared technological infrastructure of Wikipedia helps to shape community boundaries for the site. To begin to see how this is so, we need only examine the later evolution of the article Benkler cites as his primary example of the Wikipedia process, the Barbie article. Benkler writes that the section of the Barbie article covering the doll's cultural impact “stabilized” in the winter of 2004, about a year before he wrote his book, and two before it went
to press. However, an investigation of the page in its current state shows that it has changed substantially over the six years separating Benkler's research from today. As it currently stands, the Wikipedia article on Barbie seems to contain only a blunted version of the criticisms of the cultural impact of the doll that existed in the version of the page Benkler cites. Some lines of critique seem to have been removed altogether. Benkler does not formally cite the exact revisions of the Barbie article he is working with, so it is difficult to say exactly which revision of the page he was looking at as he composed his discussion of the article. However, he does write that he believes the section of the article dealing with critique “stabilized” after an edit made three weeks after a major re-write that occurred on January 5, 2004. Thus, a revision of the article from the morning of February 6, 2004 should provide a close approximation of the version Benkler based his assessment of Wikipedia content on. The "Controversies" section of this revision of the article reads as follows:

**Barbie's Physical Evolution**

Over the years, Barbie has evolved. Originally available as either a blonde or brunette, Barbie has changed the color of her hair many times since her introduction in 1959. Today there are ethnically diverse versions of Barbie that feature different skin tones, facial characteristics, as well as different hair colors and make-up.

One of the most publicized changes happened around the turn of the century, as Barbie's ultra-thin waist widened to more natural proportions. This change, rallied for years by some parents' and anorexia groups, is to encourage young girls not to be as hyper-actively concerned with their weight, and thus to eat more healthily.
and avoid eating disorders.

Other discussions
Barbie is often looked upon as an icon of Western childhood. Her popularity ensures that her effect on the play of Western children attracts unusual scrutiny. The enormous range of available accessories relating clothes, hair, make-up, parties and looking pretty give rise to the accusation that Barbie encourages young girls to focus on shallow trivia. Her accessories reflect a lifestyle that is unobtainable for most of the girls who play with her. She also portrays an unrealistic body image; in real life she would be towering over most men and have an impossible breast size. For most of her life she was available only as a white woman of apparently European descent.

However at the time Barbie was released, most dolls were baby substitutes, rather than adult dolls, and it could be said that Barbie's very existence encouraged girls to play outside the traditional role of housewife and mother. The range of professions for which Barbie accessories can be bought has been expended recently, including doctor, politician, US Marine and paralympic athlete. Barbies with different racial characteristics have also become available in recent decades. Because Barbie is a cultural icon in the United States, and the dolls are inexpensive and easily obtained, artists have referred to Barbie and her accompanying products, either as homage or as parody. The Mattel Corporation disapproves of many of these uses for the dolls, and has used trademark and copyright claims to attempt to suppress them.
"Barbie" is often used as a derogatory slang word to mean that a person, particularly a girl or woman, is stupid, as in "Barbie brain", "Barbie bimbo" or "Barbie head" ("Barbie - Wikipedia, the free encyclopedia," 2004).

This version of the article text establishes the extent of “critical” content in the article as it stood when Benkler used it as an example. We can see that Benkler bases his claim that the Barbie article contains a "critique of Barbie's emphasis on high consumption," on the inclusion in the article of the assertion that, "The enormous range of available accessories relating clothes, hair, make-up, parties and looking pretty give rise to the accusation that Barbie encourages young girls to focus on shallow trivia." This is a slender critique of consumerism, perhaps, but it does establish the presence of such critique in the article.

However, over the course of the next six years, this criticism would be substantially weakened. As of May 17, 2010, the "Controversies" section of the Wikipedia article on Barbie demonstrates significant differences with the earlier version quoted above. First, the entire section is preceded by the two sentence introduction:

Barbie's popularity ensures that her effect on the play of children attracts a high degree of scrutiny. The criticisms leveled at her are often based on the assumption that children consider Barbie a role model and will attempt to emulate her (http://en.wikipedia.org/w/index.php?title=Barbie&oldid=362598506).

This introductory language seems to have evolved gradually from the two sentence opening to the "Other Discussions" subsection of the February 2004 article, which reads: "Barbie is often looked upon as an icon of Western childhood. Her popularity ensures that her effect on the play of Western children attracts unusual scrutiny." By February of 2005, this language had migrated
Barbie is often looked upon as an icon of Western childhood. Her popularity ensures that her effect on the play of Western children attracts a high degree of scrutiny. The criticisms leveled at her are often based around the idea of children considering Barbie a role model and attempting to emulate her (“Barbie - Wikipedia, the free encyclopedia,” 2005).

During a major revision of the page on October 14, 2006 (just months after the release of Benkler's book) user Ianmacm altered this to combine the first two sentences and to revise the language that said criticisms of Barbie are “based around the idea of children” emulating Barbie to read that these criticisms are based on “the assumption that children consider Barbie a role model” (“Barbie - Wikipedia, the free encyclopedia,” 2006). For the last three and a half years, this introduction has, in fact, remained almost entirely stable.  

The only substantial revision was the revision of the first sentence to read that the effects of play with Barbie "children," rather than "Western children," attracts a great deal of scrutiny. By revising the introductory language to suggest that the critique of Barbie was based on an "assumption" that children maintained a certain sort of relationship with the doll serves to soften and undercut the later critique.

This was not the only important change made by this user in the substantial revision on October 14, 2006. In addition, he or she removed the language that suggested Barbie's staggering array of purchasable accessories encouraged girls to focus on "shallow trivia," and reorganized the controversies section into a series of four bullet points, each documenting a particular episode of controversy in the history of the doll. For example, one bullet point documents the

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10 So far as I can tell from a reasonably close investigation of the history pages. It is not impossible that this language might have been altered or removed from the article for weeks or even months at a time during this period, before being restored.
banning of Barbie in Saudi Arabia, and another discusses the controversy over her unrealistically proportioned body (“Barbie - Wikipedia, the free encyclopedia,” 2006). By May of 2010, this list of bullets had grown to nine, and now includes such issues as the possible leaching of toxic chemicals from older Barbie dolls manufactured from vinyl, to the release of a Barbie that shipped with stickers meant to emulate tattoos (some critics believed children would be then want to be tattooed themselves) (“Barbie - Wikipedia, the free encyclopedia,” 2010). However, none of these bullets directly addresses the notion that Barbie might encourage consumerism or a focus on trivial material goods, a criticism that has been missing from the article since October of 2006.

Furthermore, many of the bullets tend to obscure the reasoning and claims employed by Barbie's critics. For example, a section documenting the controversy over the release of Barbies with a voice chip that uttered such phrases as “will we ever have enough clothes?” and “I love shopping,” which was explicitly connected to Barbie's consumer focus in an earlier revision of the page (“Barbie - Wikipedia, the free encyclopedia,” 2005), now simply notes that the inclusion of the phrase “Math class is tough” in Barbie's vocabulary, “led to criticism from the American Association of University Women” (“Barbie - Wikipedia, the free encyclopedia,” 2010). The substance of the organization's critique, as well as the reasoning behind it, are entirely absent. Even the section documenting the critique of Barbie's figure, which has remained present throughout the page's history, no longer suggests that the decision by Mattel to widen the doll's waist in 1997 was motivated by complaints about the doll by parents and anti-anorexia activist groups, as it did even immediately after the major re-write in 2006 (“Barbie - Wikipedia, the free encyclopedia,” 2006), but rather reports that Mattel gave its motivation as “that this [change]
would make the doll better suited to contemporary fashion designs” (“Barbie - Wikipedia, the free encyclopedia,” 2010).

The evolution of the Barbie article demonstrates how Wikipedia content has been dictated by the boundaries of the Wikipedia community, rather than reflecting diverse individual desires. Specifically, Wikipedia's Verifiability policy (WP:V) privileges information directly traceable to referenced sources, which, as I will explore in detail later, may create an environment in which the sort of low context facts available in the bullet points of the Barbie article are privileged. All this is not meant to suggest that Wikipedia is simply a reproduction of corporate propaganda, or that it is hopelessly compromised by the capitalist environment in which it operates. It does, however, strongly suggest that Benkler's focus on simply guaranteeing the technical ability of individuals to participate in the production of information based on diverse individual motivation may misunderstand the actual contours of peer production. Instead of focusing on cyborg individuals and their desires, we should instead focus on communities of production and their boundaries.

The boundaries of the Wikipedia community are especially important because Wikipedia has become a large, centralized space of information production on the World Wide Web. This is in contrast to Stallman's original call for “an encyclopedia located everywhere,” which imagined a decentralized method of information production. Benkler, as well, imagines the web as a space where a diverse set of information resources will be accessed, as shown by the diverse list of author/owners he points out in his Google search for “viking ships.” Under such conditions, those who felt their opinions had been marginalized by the Wikipedia article on Barbie would be able to leave the Wikipedia community and create a version of the article elsewhere that reflected
their point of view. Such a move would be called *forking* the article. To create such an article
fork on Wikipedia itself is explicitly prohibited by Wikipedia policy (“Wikipedia:Content forking
- Wikipedia, the free encyclopedia,” n.d.). However, as the policy itself points out, Wikipedia's
license means that anyone is free to copy, modify, and redistribute an article, or even the whole
of Wikipedia, if they so wish. In this way, Wikipedia maintains the formal right for users to split
from the project. However, as we will see, this formal “right to fork” has not resulted in a
decentralized “encyclopedia located everywhere.” In the next section, I trace the historical forces
that helped to create Wikipedia as a large, centralized space of knowledge production.

**The Wikipedia Utility: The Centralized Embodiment of the Contemporary Wikipedia**

When early Wikipedians were writing the 2001 FAQ quoted earlier in this chapter,
Wikipedia's physical body was quite modest. In one post to the Wikipedia-L mailing list, Jimmy
Wales describes it as a single server equipped with 512 megabytes of memory (Wales, 2001k).
Today, many of us have more powerful computers serving as our laptops. Even in 2001, this
represented a cheap and readily available server. Compare this to today, when the Wikimedia
Foundation maintains a primary hosting facility for Wikipedia in Tampa Florida consisting of
300 servers, responsible for handling 150 million hits per day. This is supplemented by
additional facilities in the Netherlands (provided as an in-kind donation by commercial hosting
service Kennisnet) and Korea (provided by Yahoo!) (“Wikimedia partners and hosts - Meta,”
is embodied today in a form that is highly centralized. Despite the fact that mirror sites of
Wikipedia exist, as well as CD versions, neither of these forms have even remotely as much
influence as the version of Wikipedia hosted at wikipedia.org. More importantly, the all
important activity of creating and maintaining Wikipedia remains centralized at this site. This centralization complicates the ideal of the cyborg individual, suggesting that computer power may no longer be as widely distributed, and information may no longer be as radically removed from physical form, as it was when FOSS hackers began their work.

It is true that Wikipedia data is reproduced in other physical bodies and across other sites. A closer examination of these sites, however, shows that these diverse physical bodies do not, in fact, decentralize Wikipedia or produce opportunities for individual actors to produce diverse content based on diverse desires. The most common form of Wikipedia data moving between different physical bodies in the everyday lives of most internet users, the apparently effortless way in which Wikipedia content flows between and among laptop and desktop computers, mobile phones, tablet devices, and other electronic displays does not, in fact, decentralize Wikipedia, rather it serves to make it even more centralized. Since these displays merely reproduce data stored on Wikipedia’s bank of servers, they do not play an independent role in either producing or distributing Wikipedia, even though they permit users to participate in the editing of the site. Instead, since a computer, cell phone or other device displaying data stored on Wikipedia’s servers is linked to those same servers in what we might consider a single, huge embodiment of Wikipedia.

The work of Nicholas Carr can help us to imagine this form of embodiment. In his 2009 *The Big Switch* Carr argues that, as the internet connects computers to one another with increasing speed and flexibility, we will see computing and information come to be dominated by a "utility model," in which large, centralized information utilities operating huge and expensive data centers will deliver both information and the programs necessary to process this
information to consumers, just as electric utilities deliver electric current. Carr believes that these information utilities will displace the use of small, decentralized personal computing devices just as electrical utilities displaced the use of small, decentralized electrical generators at the beginning of the twentieth century. In both cases, Carr points to the greater efficiency of centralized utilities as a force making the shift to them inevitable (Carr, 2009). This stands in stark contrast to Benkler's assertion that “freestanding computers,” the material basis of the cyborg individual, are "cheaper" than networks of servers and clients by, “felicitous happenstance.”

Wikipedia, then, might be seen as being embodied in the form of an "information utility," in which information processing and distribution are done by centralized servers connected to much less capable peripheral devices. Benkler's vision of diverse information production enabled by the diverse desires of cyborg individuals might still be preserved, however, if it were possible for multiple versions of this utility to thrive. Wikipedia's license, after all, explicitly guarantees that anyone who wishes to do so may copy Wikipedia's information and distribute it elsewhere, either as is or with modifications. Indeed, many entities have done exactly this. We can divide such reproductions into two categories: mirrors, which reproduce Wikipedia data as is, and forks, which modify Wikipedia data or attempt to take the project as a whole in a new direction. Wikipedians have themselves been keeping an extensive list of forks and mirrors of Wikipedia data (“Wikipedia:Mirrors and forks - Wikipedia, the free encyclopedia,” n.d.), which is maintained for the purpose of ensuring that forks and mirrors comply with the terms of the Wikipedia license, and to prevent these mirrors from being used as sources on Wikipedia itself (possibly resulting in circular referencing). In the next two sections, I demonstrate why neither
the mirrors, nor the forks, of Wikipedia that currently exist succeed in creating the decentralized model of cyborg individual based production that both Benkler and Stallman imagined. I trace some of the historical forces that instead helped to build Wikipedia as a large, centralized space for information production.

**A Web of Linkbacks: The marginal role of Wikipedia Mirrors**

Since they simply reproduce Wikipedia data without alteration, mirrors do less to provide opportunities for diversifying Wikipedia content compared to forks. Indeed many of the mirrors listed appear to be crass attempts to monetize Wikipedia content by wrapping it with ads, or by using it as the basis for a variety of SEO (search engine optimization) schemes. For example, one Wikipedian writes of listed mirror "area51.ipupdater.com," as "Purpose may be spammy: has Google Ads, no real content of its own," and another, vestigatio.com is described as, "Huge Link farm based on full wikipedia mirror. Each article has google ads"¹¹ ("Wikipedia:Mirrors and forks - Wikipedia, the free encyclopedia," n.d.). Even so, mirrors play an important role in diversifying the physical embodiment of Wikipedia, as recognized by early Wikipedians. First, they represent a potential decentralization of the distribution function of Wikipedia, which could serve to spread the load of hosting the encyclopedia across a variety of organizations and prevent any single one from being responsible for raising the money necessary for meeting the staggering hosting fees currently paid by the Wikimedia foundation. Second, they allow for a sort of "back up" of Wikipedia content that might become useful in the case of either a technical disruption to the Wikimedia foundation servers, or any attempt by the foundation to use their access to those servers to influence Wikipedia in inappropriate ways.

¹¹ a link farm is a collection of sites that link to each other for the purpose of gaming a search engine's ranking algorithm
However, as it stands, most, but not all, Wikipedia mirrors are quite obscure. By many measures, Wikipedia itself is one of the most visited sites in the world. As of June 2010 Alexa, which publishes information on website traffic (including a list of the top 500 most visited sites), lists Wikipedia as the sixth most visited site world-wide, with only the major search engines, YouTube, and social networking site Facebook generating more traffic (“Alexa Top 500 Global Sites,” n.d.). Google’s DoubleClick ad planner, which maintains a list of the 1000 most visited websites, lists Wikipedia as the fourth most visited site, though this list excludes some Google sites (“Top 1000 sites - DoubleClick Ad Planner,” n.d.). Only two sites providing Wikipedia mirrors appear in the DoubleClick and Alexa listings of the most visited websites. They are Answers.com, which is listed at #61 by DoubleClick and #142 by Alexa, and The Free Dictionary, which is listed at #144 by DoubleClick and #300 by Alexa.

These are quite significant sites, however, two factors limit their ability to serve as a decentralized medium for distributing Wikipedia. First, as their rankings indicate, they currently receive far less traffic than Wikipedia itself, limiting their ability to spread the load of distribution. DoubleClick estimates that Wikipedia receives 310 million visitors per month, and serves close to eight billion pages. In contrast, Answers.com receives 34 million visitors and serves 250 million pages, and The Free Dictionary draws 17 million visitors and serves 130 million pages (“Top 1000 sites - DoubleClick Ad Planner,” n.d.). Combined, the two sites see only 16% of Wikipedia’s visitors and serve less than 5% of its pages. Furthermore, both Answers.com and The Free Dictionary are aggregator sites that host a variety of other content in addition to their copies of Wikipedia. Thus, the number of visitors utilizing these sites as Wikipedia mirrors must be smaller than their total number of visitors. The second factor limiting
the utility of these sites as meaningful parts of a decentralized distribution model for Wikipedia is their business model. Both sites are supported by on-site advertising. As we will see, Wikipedians have often expressed anxieties about having advertising associated with the project, and would be unlikely to turn to an ad supported site as a back up in the case of either an accidental or intentional interruption to the Wikimedia Foundation's servers.

One factor driving the relative obscurity of Wikipedia mirrors might be their relative lack of visibility in search engine results. Wikipedia's prominent placing in the results returned by Google has been noticed recently by scholars. Siva Vaidyanathan cites a 2008 article in the Chronicle of Higher Education which reports that a study done at the Hoover Institution finds that searches for 100 common “terms from prominent U.S. and world history textbooks” return Wikipedia as “the No. 1 hit [...] 87 times out of 100” (Vaidhyanathan, 2008). Vaidynathan goes on to note that he has “been trying to understand the rather rapid rise of Wikipedia entries in Google searches starting in 2007. In mere months, every search I did went from generating no Wikipedia results to having them at the top of the list” (Vaidhyanathan, 2008). On a less anecdotal level, Nielsen's Net Ratings finds that web traffic to Wikipedia has grown "nearly 8,000 percent" over the five year period from 2003-2008 and that "four of the five top referring sites to Wikipedia [...] are search engines"("Wikipedia U.S. Web Traffic Grows 8,000 Percent, 2008").

Prior to this rapid rise of Wikipedia in Google's results, however, at least some Wikipedians were concerned that Wikipedia might be eclipsed in search visibility by its own mirrors. This anxiety about being lost in a sea of duplicates lead Wikipedia editors to consider tactics that might help to distinguish Wikipedia from mirrors, or otherwise ensure Wikipedia's
centrality. On August 2, 2004, editor The Anonme posted an essay to Wikipedia's project discussion area entitled "Send in the Clones." In it, he noted that, "there are now a large number of clones of Wikipedia's content on the World Wide Web," and that, "many of these clones are using search engine optimisation techniques to achieve higher rankings on search engines than the original Wikipedia pages"("Wikipedia:Send in the clones - Wikipedia, the free encyclopedia,” n.d.). In response to this, the editor asked, "should we start to try to compete with these sites?" suggesting that Wikipedia might need to engage in Search Engine Optimization techniques of their own in order to,"keep its traffic up to maintain its momentum, lest it slip into a spiral of decline"("Wikipedia:Send in the clones - Wikipedia, the free encyclopedia,” n.d.).

Fairly extensive discussion of the topic ensued on this page, and its associated talk page, for the remainder of 2004, with sporadic updates continuing into 2005. On April 30, 2006 the page was tagged as "historical," indicating that it was no longer an active discussion space, and maintained as a archival record.

Over the course of its active period, the discussion on the "Send in the Clones" essay page drew comment from over 50 Wikipedia editors. Editors differed widely as to the proper response to the proliferation of highly visible Wikipedia mirrors. Some advocate using Search Engine Optimization (SEO) techniques such as encouraging bloggers and other to link back to Wikipedia content to raise its search ranking (known as Googlebombing). Others suggest tweaking the way the Wikipedia software itself works to make it more amenable to Google's web spiders. Still others suggest that Google will be compelled to fix the problem itself in time, with a few suggesting that "Jimbo" (Jimmy Wales) has friends at Google who might be able to help ("Wikipedia:Send in the clones - Wikipedia, the free encyclopedia,” n.d.). While no consensus
emerges as to what, if anything, should be done to improve Wikipedia's search standing, it is clear that something does cause Wikipedia's standing to improve. Of the eight examples cited by Wikipedia users in this discussion as examples of searches where mirrors outranked Wikipedia in Google results, all eight now return Wikipedia as the *first result*. None of the searches currently return any Wikipedia mirrors on the first page.

However, while the "Send in the clones" essay does not reach any definitive conclusions about whether or not Wikipedia should seek to actively shape search results, one broad consensus does seem to emerge out of this discussion, namely that it is both necessary, and important, for any sites that mirror Wikipedia content to abide by the terms of the GFDL. By the close of the active editing period, the introductory language of the essay had been modified to stress the importance of the GFDL. It reads that mirrors are, "fine if they are in compliance with the GFDL; indeed, [such mirrors were] one of the original goals of the project" ("Wikipedia:Send in the clones - Wikipedia, the free encyclopedia," n.d.). Even the section of the document devoted to discussing the option of making no attempt to improve Wikipedia's search standing relative to its mirrors reads, “[GFDL] Compliant mirrors help us in our goal to educate and inform; uncompliant mirrors we should encourage, pressure, and cajole into becoming compliant” ("Wikipedia:Send in the clones - Wikipedia, the free encyclopedia,” n.d.). One editor adds to the talk page, writing that, “I for one object to my work being NICKED,” (“Wikipedia talk:Send in the clones - Wikipedia, the free encyclopedia,” n.d.) and argues that the GFDL requirement that copies provide proper attribution be followed. Another, invoking the same advantages of mirrors that earlier Wikipedians envisioned, writes that, "I'm happy to have all my work cloned as much as possible as long as the GFDL license is followed. Much better that than
have it lost if wikipedia ever disappeared or got closed down” (“Wikipedia:Send in the clones - Wikipedia, the free encyclopedia,” n.d.).

However, the editors collaborating on the "Send in the clones" essay were not always clear as to what compliance with the GFDL entailed, and some considerable debate ensued about this. Most significantly, there was disagreement about whether or not the GFDL required mirror sites to provide a link back to the original article on Wikipedia. For proponents, such links were the best way to fulfill the GFDL’s requirement that copies and derivative works of GFDL licensed content provide attribution to the original authors. Since it would be impractical to list all of the contributors to a Wikipedia article, their reasoning went, providing a link back to the original page on Wikipedia would allow for the page history, which listed all contributors, to perform this attribution function. In addition, proponents argued that asking mirrors to provide links back could provide a variety of beneficial effects for Wikipedia, including ensuring that users could find the most up-to-date (and presumably accurate) version of articles, raising Wikipedia’s search standing by increasing the number of incoming links to the site, and providing readers who wanted to become Wikipedia editors with a path for doing so. Detractors argued that the GFDL did not explictly require mirror sites to use links to fulfill the attribution function, and suggested that Wikipedia’s imposition of such a specific requirement on mirror sites might not be justified, especially as Wikipedia might not be in full compliance with the letter of the GFDL itself (“Wikipedia:Send in the clones - Wikipedia, the free encyclopedia,” n.d.).

Indeed, the GFDL is silent as to the method of attribution that re-users of GFDL licensed content should employ. However, despite this, the practice of asking for such links seems to have
been well established Wikipedia policy by the time the "Send in the clones" essay was written in the summer of 2004. As early as October 2001, Wales and Sanger both called for sites reusing Wikipedia content to link back to Wikipedia in posts to the Wikipedia-L mailing list (Wales, 2001l) (Sanger, 2001d). The version July 2004 version of the Wikipedia:Copyrights page, which provides guidance to users in meeting copyright obligations when both contributing to Wikipedia and reusing its content, notes that re-users may be able to fulfill the requirements of the GFDL, "by providing a conspicuous direct link back to the Wikipedia article hosted on this website" ("Wikipedia:Copyrights - Wikipedia, the free encyclopedia," 2004). However, this page also notes that that such a link may not meet the terms of the GFDL since "the Wikimedia Foundation makes no guarantee to retain authorship information and a transparent copy of articles," and encourages re-users of Wikipedia content to maintain their own copies of this information ("Wikipedia:Copyrights - Wikipedia, the free encyclopedia," 2004). The August 2004 version of form letter provided for Wikipedia users to send to websites reusing Wikipedia content uses even stronger language to encourage linking back to Wikipedia from mirrored content. It reads "we'd like to point out that to use content from Wikipedia you should include a link back to the source Wikipedia article" ("Wikipedia:Standard GFDL violation letter - Wikipedia, the free encyclopedia," 2004).

Since 2004, Wikipedia has evolved a great deal, and changed its license from the GFDL to the Creative Commons Attribution-Sharealike 3.0 Unported license (CC-BY-SA). Nonetheless, language on the site shows that the community continues to consider it important that sites mirroring Wikipedia content provide links back to Wikipedia. Under the heading "Attribution" the current Wikipedia:Copyrights page reads:
To re-distribute text on Wikipedia in any form, provide credit to the authors either by including a) a hyperlink (where possible) or URL to the page or pages you are re-using, b) a hyperlink (where possible) or URL to an alternative, stable online copy which is freely accessible, which conforms with the license, and which provides credit to the authors in a manner equivalent to the credit given on this website, or c) a list of all authors (“Wikipedia:Copyrights - Wikipedia, the free encyclopedia,” 2010).

The current version of the form letter to be used in contacting those who are re-using Wikipedia content in violation of the license includes the following: "Also, we strongly recommend that you link back to the original Wikipedia article; the alternative is to list all authors of the article on your own server” (“Wikipedia:Standard license violation letter - Wikipedia, the free encyclopedia,” 2009). A page entitled Wikipedia:CC-BY-SA Compliance describes "High" compliance with the CC-BY-SA as: "Approximates our licence; should mention Wikipedia should link to original article (or stable equivalent), maintain copyright, license, and warranty (see Wikipedia:General disclaimer) notices and include or link to license” (“Wikipedia:CC-BY-SA Compliance - Wikipedia, the free encyclopedia,” 2010).

The practice of asking those who re-use content to include a link back to the original article arranges Wikipedia and its mirrors in a particular geometry. Since mirrors are encouraged to link to Wikipedia, but Wikipedia does not reciprocate these links, Wikipedia occupies a privileged center position, with mirrors marginalized on the periphery. Thus, the decentralized geometry, the cyborg individual geometry, of production that Benkler and Stallman imagined is disrupted. Most users encountering Wikipedia content on a mirror will have a clear route back to
Wikipedia, but the only users on Wikipedia likely to find mirrors are those who investigate deep into the project pages and find the listing of mirrors and forks. It is not at all clear if this arrangement in fact raises Wikipedia's search visibility, as some of the editors involved in the "Send in the clones" essay believed. What is clear is that, from very early in the project, Wales and Sanger saw occupying this central position as both beneficial and necessary for Wikipedia. Wales, in his October 2001 post to the Wikipedia-L explaining why he felt there was a need to encourage link backs wrote that he wanted to see Wikipedia content picked up by, "Yahoo, AOL/Time Warner, Disney, Google, Microsoft, Altavista, Lycos, etc." as the basis for their own encyclopedia projects, but that, "when they do so, we want them to link back to the original project, so that we can ensure that we remain the "canonical source" for our own community works"(Wales, 2001l).

Sanger, in his post, is even more clear about why he believes that link backs are crucial for the project. Sanger believes that link backs help Wikipedia secure the labor that it needs to grow and change. He writes: "I want to make sure that people who want to contribute to the Wikipedia and Nupedia projects, who see Wikipedia and Nupedia content on other websites, are given the option of returning to the original source of the content and working on it"(Sanger, 2001d). Making Wikipedia a central location in the web of its own mirrors was seen as a crucial step for ensuring that Wikipedia gathered the labor power it needed to be a vibrant and effective space for producing content. As we will see, the need to centralize labor power has had an even more drastic limiting effect on those other re-users of Wikipedia's content, forks.

"In every case I have given you what you wanted": The Fork And Wikipedia's Appetite for Free Labor
True forks of Wikipedia would do much more than mirrors to establish the sort of diverse, cyborg-individual driven information environment that Benkler imagines. Forks would permit those who felt the consensus on truth established within Wikipedia to be unjust or incorrect the ability to express themselves elsewhere. As I mentioned earlier, Wikipedia policy explicitly reminds editors that they have the right to create such forks, even as it asked them not to create point-of-view based forks of articles within Wikipedia itself (“Wikipedia:Content forking - Wikipedia, the free encyclopedia,” n.d.). The perception that forking had value as a method for preserving Wikipedia in the event that its “freedom” was compromised by a central point of control was also expressed by early Wikipedians on the Wikipedia-L mailing list (Jasiutowicz, 2001b).

In practice, however, true forks of Wikipedia are even rarer and more obscure than mirrors. Of the 846 pages listed by Wikipedians as mirrors and forks of Wikipedia, 84 are explicitly described by their list entries as “mirrors,” whereas only 16 are explicitly described as “forks” (“Wikipedia:Mirrors and forks - Wikipedia, the free encyclopedia,” n.d.). No forks of Wikipedia appear on the Alexa list of 500 most-visited websites, or the Google doubleclick list of the 1000 most-visited websites. Even if we expand the definition of “Wikipedia fork” to include not only direct spin-offs of the Wikipedia project, but also other attempts to build a web-based volunteer encyclopedia, we find no prominent examples. Citizendium, a highly publicized encyclopedia project launched by estranged Wikipedia cofounder Larry Sanger and incorporating some Wikipedia material revised to meet review by traditional academic experts, has an Alexa rank of 48,837 (“citizendium.org - Information from Alexa Internet,” n.d.). Conservapedia, an ideologically conservative encyclopedia launched by activist Andrew Schlafly that has attracted
extensive media coverage (Muir, 2008; Read, 2007; Siegel, 2007), earns an Alexa score of 63,273 ("conservapedia.com - Information from Alexa Internet," n.d.). An examination of the “recent changes” feature of both pages shows that, unlike Wikipedia which is edited on average three times every second, both Citizendium and Conservapedia are being edited a mere few hundred times a day.

Wikia, a collection of wikis hosted by a for-profit company founded by Jimmy Wales, might be argued to be a highly visible Wikipedia fork. Indeed, Wikia sites do include a large number of encyclopedia-like projects, and some do, in fact, re-use content from Wikipedia. Wikia.com earns the respectable Alexa rank of 204. However, Wikia cannot be considered a true Wikipedia fork. Jimmy Wales has made a concerted effort to make the missions of the two sites distinct and non-overlapping, calling Wikia “the rest of the library” in comparison to Wikipedia's encyclopedia ("User:Jimbo Wales - Wikipedia, the free encyclopedia," 2010). The most popular Wikia sites are devoted to pop-culture and fan culture, consistent with the site's extensive advertising and commercial branding. Furthermore, while Wikia.com as a whole draws a great deal of traffic, individual wikis on the site remain relatively obscure. For example, a Barbie wiki hosted on Wikia, a clear opportunity to “fork” the Barbie article discussed by Benkler and introduce further information, currently is composed of only a handful of articles on Barbie and her companion dolls. The lead article is a copy of an older version of the Wikipedia article on Barbie, however this article has languished since its creation in 2008. The page has attracted so little editor attention that obvious formatting and typographical errors linger uncorrected ("Barbie - Barbie Wiki," 2010). This lack of editor attention on the Barbie Wikia begins to hint at a problem for forks in general: the problem of labor.
We can better understand how the need to secure labor limits the ability of individuals to create successful project forks by examining two examples of attempts to fork Wikipedia. Two early attempts to fork, or duplicate, Wikipedia left particularly interesting records in the form of mailing list discussions and secondary records. They were the Spanish Fork, in which Wikipedians working on the Spanish-language Wikipedia left to begin their own project, Enciclopedia Libre Universal, early in 2002, and the GNUpedia project, an encyclopedia project announced by the Free Software Foundation in early 2001, just as Nupedia was transitioning to the GFDL and Wikipedia was becoming a reality. An investigation of the early history of these two projects will reveal some of the forces that limited the ability of these forks to attract and retain a supply of volunteer labor. Furthermore, the example of the Spanish Fork, in particular, demonstrates how forking serves the peer production process not as a tool for individual empowerment, but as a check on potential abuses of collective labor.

*GNUpedia*

Early in 2001, the GNU project, which had been founded by Richard Stallman and had previously worked on a variety of Free Unix compatible utilities and other software, announced that it would begin work on an encyclopedia project, called GNUpedia, in line with Stallman’s 1999 call for a “A Free Universal Encyclopedia and Learning Resource.” The ultimate failure of the GNUpedia project demonstrates how Wikipedia organizers, particularly Jimmy Wales, were able to skillfully use the cultural values of the hacker community, especially an aversion to “duplicate work,” to prevent what they saw as a harmful diversion of labor from the Wikipedia project.

The earliest available version of a page devoted to the project on GNU’s website,
archived by archive.org's Internet Wayback Machine on January 24, 2001, describes the project in ambitious, if somewhat vague terms. It reads: “GNUPedia is a project for the development of a free encyclopedia. GNUPedia IS NOT part of the GNU System (we don't need an encyclopedia on the operating system). The GNU community supports GNUPedia by contributing with the software needed to collect and search the data on the encyclopedia” (“GNUPedia Project - GNU Project - Free Software Foundation (FSF),” 2001). The page invites visitors to submit HTML formatted articles to the encyclopedia, with no guidance other than, “The articles must be in HTML format, and must follow some minor rules. We still have to define them, in the meantime you can send us your articles.” It promises that, once enough articles have been collected, a link near the top of the page reading "enter the encyclopedia," will be made active for users to access the GNUpedia. On January 16, 2001, project coordinator Hector Arena sends a brief test message to a mailing list dedicated to the project (Arena, 2001a). By the next day the mailing list is a frenzy of activity, with dozens of messages inquiring about article submission, discussing project goals, and proposing sometimes extensive plans for future action.

This activity quickly fades. By April of 2001, the page for GNUpedia has been replaced on the GNU website with an announcement reading:

Our idea for a free encyclopedia is described in The Free Universal Encyclopedia and Learning Resource.

Just as we were starting a project, GNUpedia, to develop a free encyclopedia, the Nupedia encyclopedia project adopted the GNU Free Documentation License and thus became a free commercial project. So we
decided to merge GNUpedia project into Nupedia. Please visit the Nupedia site to contribute to the free encyclopedia. ("The Free Universal Encyclopedia and Learning Resource - GNU Project - Free Software Foundation (FSF)," 2001)

Meanwhile, on the mailing list, the flow of messages had slowed to a trickle, with a few dedicated volunteers continuing to attempt to develop a project they were now calling GNE (a recursive acronym in the tradition of GNU, GNE stood for GNE's Not an Encyclopedia). By early 2002, even these volunteers had departed and the list was receiving only automated spam messages advertising free printer ink and attempting to deliver trojan-infected executables. A lonely homepage for GNE remains on the servers of Sourceforge (a popular hosting site for Free and Open Source software projects) but any visitors there will find no links to any content, only an ambitious manifesto proclaiming that GNE is, "an attempt to build a comprehensive documentation of all human thought," and promising that, "there is no central authority here that will censor your text. GNE and moderators will not influence the bias of any article, so this will not become westernised like so many resources" ("GNE - Home," n.d.).

After such a promising beginning, how did GNE meet such a sad end? In many ways, the story begins on the afternoon of January 17, 2001, when Jimmy Wales sends the following message to the GNUpedia mailing list:

I would like everyone here to please investigate http://www.nupedia.com/

We have been in existence for a year now, and we have over 2500 contributors already organized into peer review groups, with editorial support in place, etc. The energy of the project continues to grow. WE WANT YOUR HELP.

:-)
Richard Stallman has been aware of us for awhile now, and within the past two weeks he offered to me that we (Nupedia and Richard Stallman) could do a joint announcement of Nupedia's switch from our own (home-grown) license to Gnu's GFDL.

Instead, he chose to announce a new, and totally unrelated project. I do not know why. Some (on slashdot) have speculated in a negative way about Richard, but I have the utmost respect for him and believe that there must be some reasonable explanation for this.

I have invited Hector Arena to join our project, and I really hope that all of the effort here will be focussed toward the existing project, rather than forking for no reason at all.

--Jimbo (Wales, 2001a)

Several things are important to note here. The first is that Wales portrays the launch of the GNUpedia project as inconsistent with prior assurances made to him by Stallman regarding GNU's support of Nupedia. In this message, Wales strikes a conciliatory tone, but in later messages he is somewhat more accusatory, writing, “I was having a nice conversation with RMS about changing our license and making a public announcement stressing the values of freedom and co-operation, and then THIS. Some co-operation” (Wales, 2001b). Stallman, for his part, never makes his reasoning behind going forward with the GNUpedia project, or his position on the relative value of having two encyclopedia projects, rather than one, entirely clear, either in his own post to the list (he makes only one substantial post) or in later messages forwarded through Arena. In his message to the list, dated January 22, 2001, Stallman writes that, “We're
talking now about merging GNUpedia and Nupedia (which would switch to the GFDL as license)” (Stallman, 2001). However, Arena forwards a later message to the list in which Stallman writes, “However, any one project is only a part of the Free Universal Encyclopedia. There's room for more than one project” (Arena, 2001d). In a yet later message, again forwarded to the list by Arena, Stallman tells Wales that Arena should be allowed to pursue a separate project since, “The practical difference [with the Nupedia project] is that he [Arena] wants not to have editorial control. But also, he wants to be independent. He doesn't want to be working under a company”(Arena, 2001e). Ultimately, he concedes that, “maybe there is no inherent reason why a project of this kind should not be part of Nupedia,” and that only “the personal situation” compels the two projects to be separate. Stallman’s support for the GNUpedia at this point seems to have been quite marginal. Ultimately, the GNU project did not choose to support the project by providing it with server space.

Along with expressing his concern over Stallman's divided loyalties, Wales uses his first message to ask GNUpedia users to consider joining Nupedia, so that, “all of the effort here will be focussed [sic] toward the existing project, rather than forking for no reason at all.” Wales would proceed to mount a sustained campaign along these lines over the coming weeks, characterizing the GNUpedia project as a fork of Nupedia (despite the fact that the two shared no code or content, and were simply parallel attempts to build a “free encyclopedia”) and asking those involved in the GNUpedia project to join with Nupedia instead. Wales depicts the notion of maintaining two separate projects with the same goal, building a free encyclopedia, as pointless and foolish. In a later post, Wales calls “breaking the project in two for no reason,” an “insane course,” and expresses his hope that “the community will speak with one voice -- divisiveness is
bad, co-operation is good, freedom is good” (Wales, 2001h). Wales seems to have quite a bit of traction with this line of reasoning among those readers of the GNUpedia list who see the missions of GNUpedia and Nupedia as fundamentally similar. In response to one mailing list member’s argument that, “I still don't think we're 'forking'. We're just redefining what 'GNE, Nupedia and The Free Universal Learning Resource' all mean,” another list member writes, “Except that many people here seem to be talking about doing a lot of the same things that Nupedia is *already* doing, and doing quite well” (Warren, 2001).

Not all of the members of the GNUpedia list agreed with Wales' assertion that the project was fundamentally the same as Nupedia. For example, some objected that the Nupedia article approval process was overly complicated, or that the project description appeared to limit participation by non-experts. In a January 21 post, GNUpedia mailing list participant Bryce Harrington writes that reading the sections of the Nupedia project description stressing the role of experts and review in the project, “put me off enough that I didn't bother trying to submit”(Harrington, 2001a). In response, Wales writes “All of this should be changed. Our actual position is much 'softer' and 'more welcoming' than the tone of that page indicates”(Wales, 2001e). Wales, in a later post, also suggested that Harrington might want to investigate Wikipedia (which was, at this point, only a few days old) (Wales, 2001f). Harrington, impressed by Wikipedia's open and easy process, would go on to suggest that GNUpedia mailing list members should become active on Wikipedia, rather than continue with their own project (Harrington, 2001b). Furthermore, Harrington would, based on his extensive posts to the Wikipedia-L mailing list, become a very active and vocal early contributor to the Wikipedia project. For the most part, Wales responds to the concerns raised about Nupedia by GNUpedia
list members in the manner demonstrated in the example above, by conceding possible Nupedia failures and promising to make changes to accommodate GNUpedia project members to Nupedia. At one point, in a response to a message in which Arena argues that he “has reasons” for wanting GNUpedia and Nupedia to remain separate, Wales writes, “I have answered, point by point, each of your reasons, and in every case I have given you what you wanted.” He continues: "If anyone can give me a good reason for the split [between GNUpedia and Nupedia], then I will answer that reason by changing whatever I need to change to make that reason go away” (Wales, 2001i).

Wales' intervention on the Nupedia list appears to have had two concrete effects. First, his concessions to the demands of GNUpedia list members seem to have been effective in convincing some volunteers initially interested in GNUpedia to join Nupedia and Wikipedia (most significantly Bryce Harrington). Second, his defense of Nupedia as the only legitimate free encyclopedia project was widely accepted by GNUpedia list members and forces GNUpedia to search for a new identity. In one of his first posts to the GNUpedia lists, Wales wrote:

But since the license is compatible (the same) there is probably no reason to have two projects... and if there *are* good reasons to have two projects (as there sometimes are), then certainly they should not have such similar names. We were here first. (How first? So first that I registered gnupedia.org in additional to nupedia.com, etc., over a year ago to prevent this kind of name confusion/dilution) (Wales, 2001b).

Arena quickly deffered to Wales' claim on the Nupedia identity agreeing that "we can change our name" (Arena, 2001c). Of course, Wales' position was considerably strengthened by his
possession of the pertinent URLs. The shift from GNUpedia to GNE, a few weeks later would slightly disrupt the project, as members lost track of the renamed mailing list. More importantly, in the absence of the clear project definition of “creating an encyclopedia,” mailing list members struggled to define what exactly GNUpedia/GNE would be. They settled on the vague notion, suggested by Stallman, that the project would be a collection of “alternate encyclopedia pages,” that is to say, of content unsuited to Nupedia. Arena put the distinction this way: “So we'll have two encyclopedia projects: Nupedia: The GNU Encyclopedia with a hard-editorial-controlled articles and Findaname [the renamed GNUpedia] -- the alternate encyclopedia pages: with everything useful”(Arena, 2001d). This is, in effect, a negative definition, describing the GNUpedia/GNE project as simply "not Nupedia."

It is this loss of both volunteers and definition that seems to have led to the project's collapse. On February 20, Arena himself appears to give up on the project, writing:

Well, as you can see in the /encyclopedia directory of the GNU webserver, Nupedia is the GNU encyclopedia project. So, 'what is this'?? Well, RMS said that there's no need to destroy this project. But I say that there's no need to have two equal projects (Jimmy has made everything to change the original Nupedia idea to the idea of GNUpedia) (Arena, 2001f).

Here we can see Wales' success in accommodating the requests of GNUpedia volunteers, and his success in securing the support of Stallman and the GNU organization. Wales' accommodation the needs of GNUpedia list members is key to his recruitment of these members as labor for Wikipedia.

In addition, the negative definition of GNUpedia/GNE as "not Nupedia" leads to
seemingly intractable debates among the remaining list participants about what the project should or should not include. The need to define the project broadly, so as to include material Nupedia leaves out, encourages radical ideas about openness and inclusiveness. Arena himself, before departing the project, endorses this line of reasoning, writing: “The GNUpedia project will accept any kind of documents as long as they have good content. Again, that's part of the freedom. Who will have the authority to refuse it? Nobody”(Arena, 2001b). However, this vague notion of “anything with good content,” proves hard to define. What is good content? How should the project deal with material that violates copyright, or material that might be illegal in some jurisdictions (such as child pornography)? These questions are never really resolved, and the project remains defined in very broad terms as it sputters to a halt in the summer of 2001, as evidenced by the vague and ambitious project definition still present on the GNE homepage on Sourceforge.

The story of GNUpedia demonstrates the importance of shared resources and collective action in the creation of Free content online. Wales’ anxiety about securing and retaining the large amount of collective labor needed to build and maintain a free encyclopedia is clear as he writes, in his first post to the GNUpedia list, “I really hope that all of the effort here will be focused toward the existing project” (Wales, 2001a). Interestingly enough, even as he works to prevent the fracturing of collective labor he perceives the GNUpedia project as representing, Wales uses the possibility of users forking the Nupedia project to reassure concerned GNUpedia list members that their labor will not be exploited. In response to the question: “How likely is the license for Nupedia going to change to something not quite as free (IE blatant corporate exploitation of a group of volunteers)?” Wales writes, “One of the
strengths of the gFDL is that it permits forking. And with the source code of the website available, as well as all of the data in all formats used (both the canonical XML and also the database files), then the chances of this are quite small” (Wales, 2001d). GNUpedia never secures the collective labor needed to build a successful project, both because Wales successfully attracts volunteers to Nupedia, and because GNUpedia's attempt to define itself as “not Nupedia” leaves the project without a strong, shared goal for volunteers to mobilize behind. Finally, the inability of the GNUpedia project to obtain necessary server resources from the GNU project weakens the effort at a crucial moment.

**The Spanish Fork**

While the example of GNUpedia shows how collective labor and shared resources shaped the failure of a Wikipedia like project, it does not directly address the history of Wikipedia itself. The story of the “Spanish Fork” does. The “Spanish Fork” is the name given to a 2002 attempt to split the Spanish Wikipedia from the larger Wikipedia project, creating an independent Spanish-language encyclopedia called, “Enciclopedia Libre Universal.” The Spanish Fork's attempt to create a separate project ultimately failed, however the attempt to fork helped force Wikipedia to reform polices Spanish fork participants objected to. Thus, the Spanish Fork demonstrates why the fork should be understood, not as a tool allowing ideal cyborg individual producers to “go their own way,” empowered by their access to distributed capital, but rather as a tool for shaping and disciplining collective projects organized around shared capital.

The best summation of the history of the Spanish Fork can be found in “The Spanish Fork of Wikipedia,” a presentation to the 2005 Wikimania conference by Ascánder Suárez & Juan David Ruiz. They tell us that users of the Spanish-language Wikipedia, which had been
initially established on May 20, 2001, gradually became concerned about a variety of issues, including questions about: “Should it [the Spanish Wikipedia] be the translation of Wikipedia in another language, Should it have its own sysops, Should there be an appointed editor (as in the English version at that time), an editor that would define some kind of style or editorial policy” (Suárez & Ruiz, 2007). These concerns lead a set of Spanish Wikipedians to establish an independent effort to create a free Encyclopedia in Spanish, entitled Enciclopedia Libre Universal (EL), which, “was born on February 26, 2002 and very soon achieves [sic] its goal to concentrate most of the users that were initially at the Spanish Wikipedia” (Suárez & Ruiz, 2007). From the article growth statistics given by Suarez and Ruiz, it appears that Encyclopædia Libre Universal enjoyed only temporary success as an independent project, before being eclipsed and reabsorbed by the Spanish Wikipedia. By December of 2003, Encyclopædia Libre Universal had grown to include 16,000 articles, making it larger than the Spanish Wikipedia of the time, which had only 12,000 articles. However, by March of 2004, the two projects had reached article parity, with both including roughly 19,000 articles at this point. Suarez and Ruiz write that "most of" the articles in the Spanish Wikipedia were copies of EL content at this point. By June of 2005 the Spanish Wikipedia had become twice as large as EL and since then has only continued to overtake its rival. In August 2006, the Spanish Wikipedia had 146,785 articles, whereas EL had a mere 32,489 (Suárez & Ruiz, 2007). Today, traffic statistics suggest EL is relatively obscure. It does not appear in the Alexa listing of the top 100 most visited sites for any of the three most populous Spanish speaking countries (Mexico, Spain, and Colombia). In contrast, Wikipedia is one of the top ten most visited sites in all three ("Alexa - Top Sites in Colombia,” n.d.; “Alexa - Top Sites in Mexico,” n.d.; “Alexa - Top Sites in Spain,” n.d.).
However, while the Spanish Fork may not have succeeded as an independent entity, the
story Suarez and Ruiz write is not one of complete failure. Instead, they suggest that the creation
of EL may have caused Wikipedia to reform itself to meet the needs of EL participants. Indeed,
the apparent re-absorption of EL by the Spanish Wikipedia may not be entirely unwelcome.
Suarez and Ruiz tell us that, “Since the creation of the EL, there has been an almost continuous
discussion at EL about the possibilities of reunification”(Suárez & Ruiz, 2007). Furthermore,
they tell us that EL participants may believe that the concerns that lead them to create an
independent project may have since been addressed by Wikipedia. “Since the fork,” they write,
“Wikipedia has become a dot-org site, the Wikimedia Foundation was created, an international
portal is available at the wikimedia.org address, each Wikipedia names its own administrators
and decides the details of the policies [sic]. There is a feeling at EL that forking the project
pushed most of these goals”(Suárez & Ruiz, 2007).

The list of concerns of EL participants about Wikipedia identified by Suarez and Ruiz
above suggests that one of the major drives behind the Spanish Fork was objection to what was
perceived as Wikipedia’s potential commercialization. Indeed, there is independent evidence
suggesting that it was concern in the winter of 2002 about the possibility that Wikipedia was
about to become commercialized that helped to drive the Spanish Fork. A message left on Jimmy
Wales’ user page on Wikipedia early in 2002 reads:

Hi Jimbo. My name is Laia Reventós, I’m a journalist from Spain. I’ve read that
the spanish wekepedians have fork and create another wikipedia in a spanish
university. They told me that the reason for leaving this project is that
wikipedia.com wants to make advertising and also that there were censorship
Larry Sanger, in his message to the Spanish Wikipedia community urging them not to depart from the project, spends considerable energy trying to address concerns these users had about Wikipedia adopting an ad-based business model. He writes:

- The Wikipedia and Nupedia projects are soon to be given to a **nonprofit** organization for management and stewardship. [...] 

- Sponsorships of this nonprofit organization (call them "advertisements" if you want) are one of the ways we are considering for funding full-time employees. All money generated from these sponsorships would go to the organization; no one will, legally, be able to **profit** from this.

- There are absolutely no plans to run any sort of advertisements anytime soon on any Wikipedia project other than the English language one.

- If we thought, or rather knew, that the projects could be adequately funded without the use of advertisements, e.g., by grants, we would certainly not speak further about the use of advertisements. They are only one option among many for fund-raising.

- Forking will not stop any GNU FDL wiki-based encyclopedia from being supported by advertisements! [...] 

- We (the management of Wikipedia--Jimbo and I) have long considered having advertisement-free versions of the encyclopedias. (We have considered using wikipedia.org and nupedia.org for these purposes.) Moreover, anyone can (if they are willing, kindly, to do the coding for this) make a mirror of Wikipedia content

The concern that Wikipedia would become an ad-supported project appears to have been shared by other members of the Wikipedia community, besides participants in the Spanish Fork, in the winter of 2002. In a discussion at meta.wikipedia.com (an early version of the Wikimedia Meta Wiki, where discussions about project goals are hosted) entitled "Making Wikipedia Profitable," a variety of editors expressed their concerns about the plan, put forth by Wales, to raise revenue for Wikipedia by running ads on the site. As Wales puts it in this discussion (he also announces this notion on Wikipedia-L and elsewhere), “One interesting angle for Wikipedia is that each page is definitively keyword-based. That is, the title of the page serves as a very clear and simple keyword. This enables us to hook up with some keyword-based advertisers. People like GoTo.com and Directhit.Com. We use these advertisers with great success at Bomis” (“Making Wikipedia profitable,” 2002). Wales writes that he is cognizant of the need to avoid alienating the community, though he apparently believes at this time that advertising may not be incompatible with this goal. “If people don’t like the way we put ads up here, if we try to overcommercialize it, then someone can very easily just take the content and put it up for free elsewhere.” Despite Wales confidence that ads could be deployed on Wikipedia, he meets with considerable push back from editors. One writes, “I think I’d probably stop contributing and telling my friends to contribute if we started running ads here. I see an ad as a withdrawal from the social bank account.” Another joins in, “The only sort of financing that I believe in for a site like this is a fat, one-time donation from someone who has too much money. Don’t tax the users with subscription fees or advertisments. These plans are doomed.” Bryce Harrington, who Wales
had recruited from GNUpedia, writes an extensive plea for a non-profit model for the site, in which he argues, “First, I think we could generally say that if Wikipedia were to start making a profit, some authors would feel cheated, or that the site had "sold out" and was no longer sufficiently community-controlled” (“Making Wikipedia profitable,” 2002). Similar sentiments are expressed, at around the same time, in other discussions on meta.wikipedia.com, (“Brainstorming for revenue sources,” 2002) as well as on the Wikipedia-L list.

While it is impossible to say definitively that the Spanish Fork alone caused a change in Wikipedia policy, the record does suggest that deploying advertisements on Wikipedia itself was taken off the table after the events of winter 2001-2002, including the Spanish Fork. Specifically, the community seems to have been given the choice between allowing advertisements on the site, and ceasing to pay Larry Sanger's salary. They chose against Sanger. As of November 9, 2001, Wales was arguing, on a post to his user page on Wikipedia, "Someday, there will be advertising on Wikipedia. Either that, or we will have to find some other way to raise money, but I can't think of any" (“Jimbo Wales/Advertising on Wikipedia,” 2002). This announcement, which he repeated in the discussion on meta.wikipedia.com cited above, and on the Wikipedia-L list as late as February 2002 (Wales, 2002a), often seems to have elicited Wikipedians to ask Wales what purposes the advertising revenue would be put towards. For example, in response to the Wikipedia-L message, cited above, list participant Daniel Mikkelsen asks: “What are the expenses involved? What is the bandwidth consumed? The storage space required? The load on servers?” (Mikkelsen, 2002). In each case, Wales responds that the costs for bandwidth, servers, etc. are actually quite modest, and that, “the major remaining expense is Larry [Sanger]'s editorial leadership” (Wales, 2002b).
At this point, Wales defends Sanger's contribution to the project, writing, "I believe [Sanger's work] has been a major factor in the success of the project to date" (Wales, 2002b). However, it is clear that support for Sanger wavers as resistance to running advertisements on Wikipedia mounts. In a post to the Wikipedia-L list dated February 13, Sanger writes that:

I was placed on half-time pay in January, and as of February 1, I am no longer a Bomis employee. [...] This means that any work I do for the 'pedias, for the near future anyway, I am doing as an unpaid volunteer, the same as the rest of you (Sanger, 2002a).

However, at this point he apparently believes that ad revenue might still enable him to return to the project as a paid employee. He writes, “Bomis might well start selling ads on Wikipedia sometime within the next few months, and revenue from those ads might make it possible for me to comeback to my old job. That would be great”(Sanger, 2002a). This notion fades over the course of the next week. In a post to the Wikipedia-L list dated February 20, 2002, Sanger complains that:

Most recently, in the wake of my announcement that I am no longer a paid employee, that I will still be working though as a volunteer, and that we might (if we can) start selling ads and soliciting donations to help pay for me once again, apparently some people reacted not by saying, very kindly, 'Oh, poor Larry, whatever will we do without him?' but instead, 'Huh? There was a paid employee? And they might sell ads?! Someone was making money?! This must be a greedy capitalist exploitative project. This shouldn't be! We've got to do something about it!' (Sanger, 2002b).
On March 1, 2002 Sanger posted a resignation notice to Nupedia-L, reading in part:

I hereby resign as editor-in-chief of Nupedia and I also hereby give up any position of authority I had with Wikipedia; assuming particularly that funding will not be able to be found for the position of Nupedia editor-in-chief (see below), I don't intend to work on either project any significant amount within the next few months, and very possibly ever (“My resignation--Larry Sanger - Meta,” n.d.).

That afternoon, Wales wrote to the Wikipedia-L list to announce that, “With the resignation of Larry, there is a much less pressing need for funds. Therefore, all plans to put advertising of any kind on the wikipedia is called off for now”(Wales, 2002c). While a broad spectrum of Wikipedia participants had expressed their displeasure with the possibility that Wikipedia would become ad-supported, it was the action of the Spanish Fork that directly threatened to cut off Wikipedia's labor supply if this displeasure was not addressed.

Wikipedia remains ad free today. The notion that Wikipedia should not, and will not, carry advertisements appears to have only become stronger over the seven years since Sanger's departure from the project. During 2009, a banner style announcement asking Wikipedia users to donate money to the Wikimedia foundation attracted controversy, with some users objecting to the announcement on the grounds that it amounted to a “banner ad” running on Wikipedia. The banners were ultimately removed. In the ensuing discussion, Wales wrote that, “I continue to oppose the introduction of any advertising in Wikipedia,” though he then went on to suggest that “the discussion should evolve beyond a simple binary,” and that placing ads “into the search results page (only), with the money earmarked for specific purposes,” might be acceptable(“Wikipedia:Advertisements - Wikipedia, the free encyclopedia,” n.d.). Such ads have
not been implemented. Ironically enough, one of the banners soliciting donations promised: "Wikipedia: Ad-free forever" (“Central notice template - Meta,” n.d.). A discussion page documenting the advertising controversy on Wikipedia includes lists of arguments both for and against running advertisements on Wikipedia. The first argument listed against the practice is, "Contributors may leave" (“Wikipedia:Advertisements - Wikipedia, the free encyclopedia,” n.d.).

The story of the Spanish Fork strongly suggests that the power of the fork to enable individuals to construct diverse meaningful alternatives to a project like Wikipedia is overshadowed by the collective destructive power of the fork. This destructive power is the ability of labor to depart a site of peer production if their collective needs are not met, destroying the ability of that site to continue producing information. The Enciclopedia Libre Universal existed as a meaningful alternative to Wikipedia for only a little over a year, and has since faded into relative obscurity. However, by demonstrating that Wikipedians might desert the project over their objection to advertising on the site, the EL fork may have had long-lasting effects on Wikipedia policy. This notion, that the real utility of the fork lay in the threat of disrupting a project if the collective needs of volunteer contributors were not met, was articulated by some early Wikipedians. One wrote, in a post to Wikipedia-L:

Every open content project has to deal with the threat of forking. Somebody just takes the code or content and starts a competing project. This is good. It keeps the managers of the project on their toes. They will have to do a good job or else the developers will go elsewhere (Boldt, 2001a).

The examples of GNUpedi and the Spanish Fork show the extent to which Jimmy Wales was cognizant of the tentative nature of his volunteer workforce in the early days of Wikipedia, and
the extents to which he was willing to go to ensure an adequate supply of labor for the site. In the next section, I will demonstrate how this need to recruit and retain volunteer labor in the face of "the threat of forking," helped to shape important Wikipedia policies, especially the NPOV.

"We have partisans working together on the same articles": Labor as Force shaping

Features of the Wikipedia Policy

The evidence presented above demonstrates why understanding Wikipedia in the terms of the ideal body of the Cyborg Individual is ultimately a mistake. Wikipedia has not been shaped by the individual desires of radically empowered consumer/producer hybrids, rather it has been shaped by the threat of collective action in the shape of the destructive fork. Nor is Wikipedia embodied by a network of small “mirrors” spread throughout the internet, rather it is centralized in large, shared Wikipedia utility. Unlike Jaron Lanier, whose famous essay “Digital Maoism” depicted Wikipedia as representative of “a new online collectivism that is nothing less than a resurgence of the idea that the collective is all-wise,” an idea Lanier warns, “has had dreadful consequences when thrust upon us from the extreme Right or the extreme Left in various historical periods”(Lanier, n.d.). I do not believe that understanding Wikipedia in “collective” terms amounts to a condemnation of the project. Rather, understanding how collective action and shared resources shape Wikipedia simply leads us to a better understanding of Wikipedia’s success as a project, as well as its potential limitations.

Tizana Terranova’s essay Free Labor: Producing Culture for the Digital Economy provides an important starting point for understanding Wikipedia as a collective process. Terranova builds on the the work of the Italian Autonomist school of Marxist critique, and the existing managerial literature on the “Digital Economy,” two radically different schools of
thought which, she argues, have “a common intuition” about information-producing labor. Namely, that this labor is “inherently collective, it is always the result of a collective and social production of knowledge” (Terranova, 2000, p. 46). The contemporary internet, Terranova argues, has created a class of free labor participating in the process of knowledge production online. Terranova identifies a key tension for this class, writing, “Simultaneously voluntarily given and unwaged, enjoyed and exploited, free labor on the Net includes the activity of building Web sites, modifying software packages, reading and participating in mailing lists, and building virtual spaces on MUDs and MOOs” (Terranova, 2000, p. 34). It is important to note the complex picture of free labor that Terranova paints here, retaining how this phenomenon is not merely exploitative. Free labor is not merely “free” in the sense of “available at no cost,” it is also “free” to exercise the power of the destructive fork and walk off the work site.

The early embrace of the GFDL by the Nupedia and Wikipedia projects clearly represents an attempt to use the social cache of the well-known Free license to attract and retain free labor. Wales says as much in an October 2001 post to the Wikipedia-L mailing list, in which he responds to calls for a Wikipedia specific license by writing:

I would actually prefer if we had a way to release under a Wikipedia-specific license, but I think we need the instant "free" credibility of the GNU FDL license. It tells people immediately that they can count on certain things (Wales, 2001m).

By this point, of course, Wales has had the experience of reassuring the GNUpedia list members with the promise that his project was licensed under the GFDL. Most importantly, Wales was able to reassure them that the GFDL ensured their right to fork the project if Wales’ company Bomis should become too exploitative. In addition, adopting the GFDL secured Wales the
support of Stallman, which denied the rival GNUpedia project the support of GNU servers and resources, preventing this rival from drawing off labor needed for Wikipedia.

Thus, we can see how the adoption of the GFDL was a Wikipedia policy choice guided by the need to secure and retain free labor. Wikipedia's most important content policy, the Neutral Point of View (NPOV), was shaped not only by the need to recruit this labor but by its collective nature as well. The NPOV was one of the first Wikipedia policies to be put in place, and was based on Nupedia's “Non-bias” content policy. However, a comparison of early versions of the NPOV to the Non-bias policy shows how the NPOV quickly evolved to meet the particularly collective needs of labor on Wikipedia. The Nupedia Non-bias policy imagines lack of bias as the function of a single article author erasing his or her own particular bias in the interest of writing an objective article. It reads, in part:

   “This question is a good (albeit not infallible) test of a lack of bias: 'On every issue about which there might be even minor dispute among experts on this subject, is it very difficult or impossible for the reader to determine what the view is to which the author adheres?'” (“Nupedia,” 2001).

From a very early stage, the NPOV reflects Wikipedia's need, not to erase or obscure the bias of a single author, but rather to build consensus and enable cooperation among multiple authors. The earliest revision of the NPOV still retained on the English Wikipedia, dated to November 10, 2001, reads in part:

   “The neutral point of view attempts to present ideas and facts in such a fashion that both supporters and opponents can agree. Of course, 100% agreement is not possible; there are ideologues in the world who will not concede to any
presentation other than a forceful statement of their own point of view. We can only seek a type of writing that is agreeable to essentially rational people who may differ on particular points (“Wikipedia:Neutral point of view - Wikipedia, the free encyclopedia,” 2001a)

Furthermore, textual evidence from later versions of the NPOV, as well as early Wikipedia press releases, demonstrates that this consensus building feature of the NPOV was seen by Larry Sanger and others as a key to ensuring Wikipedia would attract, retain, and use collective labor effectively. By December of 2001, the NPOV had been extensively updated and expanded. Among the added content is a section entitled, “Why should Wikipedia be unbiased?” which reads, in part:

Wikipedia is a general encyclopedia, which means it is a representation of human knowledge at some level of generality. But we (humans) disagree about specific cases; for any topic on which there are competing views, each view represents a different theory of what the truth is, and insofar as that view contradicts other views, its adherents believe that the other views are false, and therefore not knowledge. Indeed, Wikipedia, there are many opinionated people who often disagree with each other. Where there is disagreement about what is true, there's disagreement about what constitutes knowledge. Wikipedia works because it's a collaborative effort; but, whilst collaborating, how can we solve the problem of endless 'edit wars' in which one person asserts that $p$, whereupon the next person changes the text so that it asserts that $not-p$? (“Wikipedia:Neutral point of view - Wikipedia, the free encyclopedia,” 2001b).
This addition to the language of the NPOV shows how the policy was understood as a means to ensure that Wikipedia was able to recruit the labor needed to build and maintain the site from a diverse pool of potential contributors, and that “collaborative effort” needed to build Wikipedia functioned smoothly, and was not wasted in “endless 'edit wars'.”

Furthermore, Wikipedia's first press release, dated January 15, 2002, quotes Sanger as saying: “If contributors took controversial stands, it would be virtually impossible for people of many different viewpoints to collaborate. Because of the neutrality policy, we have partisans working together on the same articles. It's quite remarkable” (“Wikipedia press release 1,” 2002). Like the additions to the NPOV, Sanger's language here shows how the policy helped Wikipedia attract, maintain, and coordinate its labor supply. Together, the GFDL and the NPOV helped to ensure that Wikipedia enjoy the large pool of collective "free labor" it needed to grow and thrive, and thus addressed the clear anxieties about attracting and retaining volunteer labor that both Wales and Sanger express in their interventions in the GNUpedia and Spanish Fork incidents.

Conclusion

In this chapter I have shown how, despite the influence of the ideal body of the Cyborg Individual on early Wikipedians, this ideal body does not, in fact, accurately describe Wikipedia's contemporary condition, which instead relies on shared resources and collective effort. Understanding how the collective body of free labor has negotiated with the owners of the shared server space that enables Wikipedia's existence helps us to understand important forces shaping the policies and practices of Wikipedia. For the remainder of this dissertation, I will continue this exploration of how collective action and centralized, shared technological resources have shaped Wikipedia. In the next chapter, I investigate how Wikipedia editors have negotiated another
large, powerful “information utility,” the search engine Google. Finally, in chapter five, I
demonstrate how Wikipedia policies, formed in part by the negotiation between capital and free
labor, as well as other forms of collective identity and collective action, have implications for
how Wikipedia deals with articles covering topics with broad geopolitical implications.
CHAPTER FIVE – WIKIPEDIA AND GOOGLE

In the last chapter, I established how the technological embodiment of Wikipedia does not closely resemble the ideal body of the cyborg individual, despite the influence of this ideal on early Wikipedians. Instead, Wikipedia can best be characterized by collective actions using large, centralized, shared technological resources. I showed how the need for Wikipedia organizers Jimmy Wales and Larry Sanger to secure the collective labor of volunteers has shaped Wikipedia policy. In this chapter I will expand my discussion to begin to explore how Wikipedia has been influenced by other large, centralized “information utilities.” Specifically, this chapter explores Wikipedia's relationship with search engines, and especially Google.

Any exploration of the various actors at work within Wikipedia would surely be incomplete without consideration of the role of search engines. Over the past fifteen years, search engines have emerged as central institutions within the cultural and economic networks of the World Wide Web. The two most prominent search engines, Yahoo and Google, have consistently occupied the number one and number two spots on Alexa's list of highest-traffic websites (“Alexa Top 500 Global Sites,” n.d.). In a memo released in August 2008, the Pew Internet and American Life Project reported that, "The percentage of internet users who use search engines on a typical day has been steadily rising from about one-third of all users in 2002, to a new high of just under one-half (49%)" (Fallows, 2008). The memo goes on to note that, "the number of those using a search engine on a typical day is pulling ever closer to the 60% of internet users who use email, arguably the internet’s all-time killer app, on a typical day" (Fallows, 2008). This daily contact with search makes the actual experience of the internet for contemporary users even more distant from the model of the internet experienced expressed by
the cyborg individual ideal. In contrast to the cyborg individual, which stressed technological resources under the direct ownership and control of human subjects, the search engine represents a distant and expensive technological resource that internet users rely on but do not own.

Some believe that search’s pervasiveness and power make it capable of dominating other players on the internet, including Wikipedia. For example, the early Wikipedians involved in the “send in the clones” debate over how to properly deal with mirrors of Wikipedia, which I dealt with at length in the last chapter, worried that Search Engine Optimization techniques could be used to bury Wikipedia results. In another example of this concern that search could dominate or determine Wikipedia content Arno de Natris suggests, in an entry on the University of Amsterdam’s “Masters of Media” blog, that Wikipedia writers use Google as a primary means for determining whether or not something exists as a valid object of knowledge. That is, they delete or retain proposed Wikipedia articles based on the results of Google searches for the article’s topic. If this were true, it would suggest that Wikipedia is simply an extension of Google, that the two had fused into a single, centralized information utility far outside the control of any human agency.

However, in this chapter I will argue that this is not quite the case. Instead, search engines and Wikipedia interact with one another in complex ways, with neither determining the other. By studying these interactions between Wikipedia and search, we can continue to build an understanding of Wikipedia that goes beyond the focus on the cyborg individual and takes shared resources and communal action into account. I demonstrate that there are three broad categories of interaction between Wikipedia and search. First, wiki projects, like most websites today, rely on search engines to make them visible to the larger community of web users. For Wikipedia,
this visibility is especially important because readers are potentially new editors. Second, Wikipedia has become an important creator of content that search engines find valuable. Thus the information utilities of Wikipedia and search are involved in a sort of exchange of value, in which search drives new labor to Wikipedia, and Wikipedia returns new content for search. Third, and finally, search engines, and especially Google, play an important role in helping Wikipedia users decide which newly created articles should be considered legitimate additions to the site and which should be deleted. The associations between Google and Wikipedia are not a case of Google determining Wikipedia. Instead, both Google and Wikipedia are mediated in the process of site editing.


The success of Wikipedia has been attributed to its ability to gain visibility via search engines. Nielsen’s Net Ratings argues that this is the case, finding that web traffic to Wikipedia has grown "nearly 8,000 percent" over the five year period from 2003-2008 and that “four of the five top referring sites to Wikipedia [...] are search engines” (Wikipedia U.S. Web Traffic Grows 8,000 Percent, 2008). While some of Wikipedia's visibility today may be due to how search engines like Google use links and other information to rank pages, rather than any effort on the part of Wikipedia editors themselves, the archives of the Wikipedia-L mailing list and archived copies of early Wikipedia pages show that establishing search engine visibility was an important concern of early Wikipedians and one they actively pursued. This activity shows that early Wikipedians, despite being informed by the cyborg individual ideal, saw connections to the centralized resources represented by search engines as valuable. After establishing this, the following section will briefly explore what benefits early Wikipedians might have hoped to gain
Many posts to the Wikipedia-L mailing list over the course of the first few months of Wikipedia's existence explicitly show Wikipedia editors from this era actively working to make Wikipedia more visible on search engines. The first of these messages, written by Larry Sanger in July of 2001, announced that the internet portal Cnet had added Wikipedia to a "metasearch" page which allowed users to search for information from a variety of sources (Sanger, 2001a). This touched off a thread on the list in which Sanger, Wales, and others discussed how to best optimize Wikipedia so CNet's search would return good results(Sanger, 2001b; Wales, 2001). In another post later that same month, Sanger announces that Yahoo has approved his request to add Wikipedia to Yahoo's search listings (Sanger, 2001c). In August 2001, early Wikipedia editor Tim Chambers forwards to the list an email he has sent to Google asking if Wikipedia content could, "be featured in search results in a distinctive way?" (Chambers, 2001).

Chambers' email also notes that Wikipedia already, "tracks its relationship to the Google spider and search engine," (Chambers, 2001) using a Wikipedia page entitled, "What Google Likes." This page, established by Wales himself, listed content on Wikipedia that was receiving significant amounts of traffic from the Google search engine. Early versions of the page provide little in the way of explanation as to why tracking these articles might be important, they simply list articles in order of the amount of attention they have received from Google and provide a list to Google's "Zeitgeist" page, presumably to assist Wikipedia editors in learning more about popular search terms and trends on Google (“Wikipedia:What Google liked - Wikipedia, the free encyclopedia,” 2001). By 2004, however, the "What Wikipedia Likes" page has grown to include language that helps to explain what Wikipedia editors might have hoped to gain from paying
close attention to Wikipedia’s visibility on Google:

Google is the most popular search engine and provides a valuable tool for Wikipedia to know what search terms people are using most frequently to find Wikipedia. Most of these visits will be newcomers, seeing Wikipedia for the first time. So it would be good for Wikipedia lovers to watch such statistics and to make sure those pages most frequently visited by new guests are in top shape.

A good impression can lead to a new user. New users lead to more content and knowledge to the ever expanding knowledge base at Wikipedia (“Wikipedia:What Google liked - Wikipedia, the free encyclopedia,” 2004).

This language shows that Wikipedia editors were driven to promote and manage Wikipedia’s search engine visibility, at least in part, by a desire to secure more volunteer labor for the Wikipedia project. This is consistent with the anxiety over free labor that led Wales and Sanger to attempt to prevent Wikipedia forks in order to maintain the supply of volunteers the site, as I discussed in the previous chapter. The 2004 version of the "What Google Likes" page goes on to again suggest that Wikipedia editors examine the Google Zeitgeist page, and suggest that they create Wikipedia content for any popular search terms that are currently lacking articles. Presumably, this would serve to further increase the traffic arriving at Wikipedia from Google, and thus also increase the labor available to the project.

The “What Google Likes” page complicates the cyborg individual informed picture of Wikipedia embraced by Benkler and others. As I examined in the previous chapter, Benkler
argues that individual desires drive peer production, as technologically empowered subjects are now free to produce culture that reflects their own needs and wants. Those involved with Wikipedia have also cited individual desire as a key force driving Wikipedia’s production process. Jimmy Wales has routinely cited “fun” as the major motivator for Wikipedians. In one interview, he answers a question about what attracts people to Wikipedia by calling “writing an encyclopedia for fun” a “geeky hobby” (“Interview with Jimmy Wales, CEO of WikiPedia — nPost,” 2005). However, the very title of the “What Google Likes” page undermines this simple understanding of the desires driving Wikipedia. It is not only the desires of individual contributors that determine site content, it is also the desires of search engines.

In recent years, pages such as "What Google Likes" have fallen by the wayside. At current, the page has been re-titled "What Google Liked" and is maintained on the site as a historical document(“Wikipedia:What Google liked - Wikipedia, the free encyclopedia,” 2009). In part, these efforts may have been killed by their own success, as editors complained that the sheer volume of traffic coming to Wikipedia made tracking "what Google likes," impossible without automated tools.

“We make the internet not suck.” Wikipedia as Engine of Content Creation

While the above shows the impact of search on Wikipedia, we should not take this to mean that the desires of search crudely determine Wikipedia's content. In as much as Wikipedia relies on the visibility provided by search engines to bring readers and new contributors to their sites, evidence suggests that sites like Wikipedia are seen by search companies as important creators of content that make search itself more valuable to users. At least one author has already noted this relationship. Historian and New Media scholar Dan Cohen, in a December 2005 blog
post, writes that he believes search companies are supporting projects like Wikipedia because they, "undoubtedly get an enormous benefit from an information resource that is not only open and editable but also free—not just free as in beer but free as in speech" (Cohen, 2005). Cohen writes that he believes that search companies will ultimately find value not only in providing the content produced by Wikipedians to their users, but also in data mining this content to refine their search technology. "In the longer term," he writes, "I think that Google and Yahoo have additional reasons for supporting Wikipedia that have more to do with the methodologies behind complex search and data-mining algorithms, algorithms that need full, free access to fairly reliable (though not necessarily perfect) encyclopedia entries" (Cohen, 2005).

Cohen may well be correct about the longer term goals of search companies with regards to Wikipedia. However, search companies, especially Google, are notoriously closed-lipped about the processes they use to refine their search engines, so evidence showing this sort of data mining is difficult to come by. This might be one reason there have apparently been no further attempts by Cohen to conclusively prove this point. Thus, this section will be limited to the data available in public sources, such as press releases and public interviews. These data suggest very strongly that search engine companies find content created by Wikipedia and related projects valuable, though I am not able to establish conclusively why. This two way relationship between Wikipedia and search, with search driving labor to Wikipedia and Wikipedia building valuable content for search, shows how the actual environment of peer production contains actors besides the technologically empowered cyborg individual. Understanding how the needs of search shape Wikipedia, and visa-versa, helps us to better understand

Search engine companies' perception that content created by sites like Wikipedia can be
of value to their business can be seen most clearly in the relationship between Wikipedia and the search company Yahoo. As I have already noted, Yahoo was one of the search engines that early Wikipedians worked to ensure Wikipedia was visible on. Yahoo, for its part, decided to include Wikipedia in its Content Acquisition Program (CAP). The March 2, 2004, press release announcing CAP's creation writes that it:

[…] enables non-commercial and commercial content providers to better interact with Yahoo! Search Technology by directly providing their Web pages, which are then added to Yahoo!’s search index and displayed in search results based on their relevance to a search term (Yahoo, 2004).

Yahoo’s press release stresses the ways in which CAP will benefit the content providers involved with greater visibility, including a quote to this effect from NPR Online's vice-president and general manager and bragging that, "content providers will be able to reach more than 75% of Web users through distribution on Yahoo! and a network of partners"(Yahoo Media Relations, 2004). However, Yahoo clearly believes that providing better access to this content will provide it with a competitive advantage as a search company. The press release calls CAP, "part of Yahoo! Search's ongoing efforts to enhance search quality and comprehensiveness" (Yahoo Media Relations, 2004). Yahoo's decision to include Wikipedia content in the CAP suggests that it believed providing access to Wikipedia content added value to its search business.

A little over a year later, Yahoo further demonstrated that it found Wikipedia valuable by investing in the Wikimedia foundation. On April 7, 2005, Yahoo and the Wikimedia foundation jointly announced that they had, "reached an agreement by which Yahoo will provide hosting capacity to Wikimedia" (Wikimedia Foundation, 2005). This donation of hosting capacity was
critically important to Wikipedia, as hosting and bandwidth are some of the most critical expenses for any rapidly growing web site. The press release works hard to put a philanthropic spin on Yahoo's donation. It states, "Yahoo!'s donation is a gesture of support for the charitable goals of the Wikimedia Foundation, and does not imply any ownership of the content. Yahoo! does not expect Wikimedia to host advertisements in return for this support" (Wikimedia Foundation, 2005). However, in a guest entry for the Yahoo search blog dated to that same day, Jimmy Wales hints at the return Yahoo might expect from its investment. Wales again stresses that Yahoo's donation will not grant Yahoo any direct control over the Wikipedia project, writing, "Yahoo’s donation is purely charitable in nature with no requirements for us to show advertising, and no ownership or control of our work by Yahoo of any kind. Yahoo is simply enthusiastic about the goodness of our work" (Wales, 2005). Towards the close of the post, however, he writes "as generous as the hosting is, we are even more excited about Yahoo’s recognition of the value of our work in enhancing the experience of Yahoo visitors" (Wales, 2005). This suggests that, despite clearly wanting to assure Wikipedia editors and others that Yahoo would not attempt to use its influence to exercise control over Wikipedia, Wales understands that Yahoo derives value from the content it is helping to make possible.

Wales should be expected to have some insights into how a project like Wikipedia might be of benefit to a search engine company. Bomis, the company owned by Wales and two partners that was the host of the Wikipedia precursor project Nupedia and the early Wikipedia itself, is a search company after all. Furthermore, it was a search company with an avid interest in harnessing the labor of users to create and sort content. Bomis prominently featured the once popular "web-ring" method of organization, in which users link together in a self-selected "ring"
of related content, as late as 2007 (“Bomis.Com Home Page,” 2007). Bomis was also an early supporter of the Open Directory Project, in which volunteers work together to build a directory of web content (Oakes, 1999). More recently, Wales has been involved with the Wikia search project, which is attempting to launch a search engine, "founded on open-source search protocols and human collaboration" (Wikia Inc., 2008) under the auspices of the for-profit Wikia Inc. While Wikia search has yet to meet with much success, it clearly shows that Wales sees a link between user-generated content, peer production, and search; and that he believes that search engine companies might be able to extract value from this relationship.

Given Wales' often flippant, playful public persona, it is perhaps to be expected that his public comments that best demonstrate the relationship between the Wikimedia constellation's ability to create content and search engine companies talk about this relationship in a playful way. In a 2005 interview with C-SPAN, Wales responded to a question by interviewer Brian Lamb about the relationship between Wikipedia and search companies Yahoo and Google:

LAMB: As I was doing – well, using Wikipedia to do the research for this interview I kept thinking when will Google or Yahoo! put Jimmy Wales out of business. And then I – as I read further, you're in business with them in some way.

WALES: Yes, in some way. I think we have – we're a non-profit organization that I founded. And we've gotten support from Yahoo! already and Google is very interested in supporting us. We're just still talking to them about what to do. And Yahoo! has donated some servers. And I think what's interesting about that is that if you – you know, it's almost a joke but it's completely true. If you think about well why – why do Yahoo! and Google want to do this and well, their
business model depends on the Internet not sucking and we help the Internet not suck. So it’s that the Wikipedia for a lot of people hearkens back to what we all thought the Internet was for in the first place which is, you know, when most people first started the Internet they thought oh, this is fantastic, people can communicate from all over the world and build knowledge and share information. And then we went through the whole dot-com boom and bust and the Internet seemed to be about pop-up ads, and SPAM, and porn and selling dog food over the Internet. And now Wikipedia kind of hearkens back to the original vision of the Internet.

And so it’s important for the whole business of the entire Internet that there be quality resources that people can turn to and want to turn to. So that’s – it’s important to these companies to support us [Punctuation and spelling from official transcript] (“Q & A with Jimmy Wales,” 2005).

The playful tone of Wales’ comments here is perhaps all the more striking given the context of the usually sober C-SPAN network, and indeed the bravado of his proclamation that "we make the Internet not suck," has been widely scoffed at and parodied by Wikipedia detractors. However, in this brief statement, Wales clearly articulates what he sees as the role of Wikipedia in the political economy of search. This role, as creator of valuable content, may afford Wikipedia a certain measure of freedom of action, ensuring that it is not put out of business by Google or Yahoo. It may also implicate Wikipedia in the larger process of exploitation of "free labor" by the commercial entities that profit from search. While the previous chapter demonstrated the ability of free labor to resist the attempt by Wales and Bomis to directly
monetize their work via advertising, this indirect monetization of Wikipedia on the part of search engines seems to have gone largely unprotested by Wikipedians. This is perhaps because the extraction of value by search engines from the labor of Wikipedians does not immediately or directly impact the editors in a way they can clearly see. Unlike the cyborg individual, who was imagined as the master of his or her machine, the technological embodiment of the actual Wikipedia includes elements that human subjects have difficulty perceiving and mastering.

Far from independent producers relying on computers in their own possession, Wikipedians are engaged with a large, distant constellation of computational resources delivered through the internet. However, as the next section shows, Wikipedia editors are not entirely at the mercy of search engines. Instead, Wikipedians are able to make their own uses of search, employing sophisticated techniques to make search results meaningful to them.

“If you are not on Google, you never existed:” How Search Informs Wikipedia's Retention of Articles

Wikipedia editors' engagement with search is not limited to use of search by Wikipedia to recruit readers and potential editors to the site, or the use of Wikipedia by search to generate valuable web content. Other authors have demonstrated that the role of search within the Wikimedia constellation extends to have a hand in the epistemology of Wikipedia itself. On a post on the University of Amsterdam’s “Masters of Media Blog” (Arno, 2008) Arno de Natris suggests that Wikipedia writers use Google as a primary means for determining whether or not something exists as a valid object of knowledge. “If you are not on Google,” he writes, “you never existed.” He presents as evidence a hoax text he attempted to insert into Wikipedia, which was refuted via this Google test. If Arno’s argument holds, then Google does not merely
influence Wikipedia’s content, it in fact determines it.

The results presented in this section suggest there is something to Arno’s argument, but that things may be a bit more complex than that one case might make them appear. Instead of crudely determining Wikipedia, search results play a more nuanced role in the process the site uses to determine what content should be retained on the site. Before going any further, it is important to note the methods used to collect some of the data I will use in this section. Since Arno’s argument revolves around the retention or deletion of information on Wikipedia, these methods sought to create data that could be used to more closely examine which new articles are retained on Wikipedia, which are deleted, and what role, if any Google plays in this process. I used an RSS reader to download Wikipedia’s new article RSS feed once every five minutes for that 24-hour period (it is possible this may have resulted in a few articles being lost). This allowed me to track which of the articles created in this 24-hour period were later deleted, even if they were deleted extremely quickly. After the data were collected, I reviewed each created article and noted several pieces of information: the deletion status of the article (deleted or retained), the presence of any attempts at deletion for retained articles, the category of deletion that was assigned to the article by Wikipedia editors if it was deleted, and the presence of any textual evidence of Google involvement in deletion discussion. All of the articles, along with the recorded data, were stored on a publicly available blog, where they may be reviewed. This blog can be found at: http://blogs.bgsu.edu/wikipediadata/

There were 1043 attempts to create articles during this 24-hour period. When I rechecked the articles approximately 5 months later, on March 2, 2009, I found that approximately 410 articles had been deleted and 633 retained.
Of the 410 articles deleted, the vast majority, about 350, were subject to what is called a “speedy delete” process. The “speedy delete” process is an administrative procedure designed to allow for the rapid deletion of obviously inappropriate material. In a sense, this is a departure from earlier deletion procedures, which treated deleting an article from Wikipedia as an act requiring careful consideration and deliberation. One of the great strengths of the Wiki format is that the software keeps records of everything, every edit to an article. Ideally, this record serves to make the Wiki process transparent, and to allow for bad edits to be reversed. Deleting an article removes this record from Wikipedia. For this reason, deleting a well-established article requires a quite deliberative process, involving on-site debate and consensus seeking.

However, as Wikipedia became larger, and more attractive to vandalism, it quickly became apparent that this deliberative process could not keep up with the vast numbers of articles being created. So for certain categories of offense, it was agreed that any administrator could “Speedily Delete” a recent article, so long as they noted that the article fit into one of the agreed upon categories. Today these “Criteria For Speedy Deletion” (CSD) encompass dozens of possible reasons for removing an article, organized into several broad groups.

Of the 350 articles created in my test period that were ultimately subject to Speedy Deletion, far and away the post common criterion cited was CSD - A7, which accounted for 134 articles Speedily Deleted. CSD-A7 is explained by the Policy page describing CSD that would have been in effect on October 1 & 2 2008 as pertaining to:

An article about a real person, organization (band, club, company, etc.), or web content that does not indicate why its subject is important or significant. This is distinct from questions of verifiability and reliability of sources, and is a lower
standard than notability; to avoid speedy deletion an article does not have to prove that its subject is notable, just give a reasonable indication of why it might be notable. A7 applies only to articles about web content or articles on people and organizations themselves, not articles on their books, albums, software and so on. Other article types are not eligible for deletion by this criterion. If controversial, as with schools, list the article at Articles for deletion instead (“Wikipedia:Criteria for speedy deletion - Wikipedia, the free encyclopedia,” 2008).

That is to say, CSD - A7 is intended to allow for the speedy deletion of articles about real people or organizations when the text of the article does not contain any meaningful assertion of why said person or group might be important enough for listing in an encyclopedia. In some cases, the lack of encyclopedic importance seems obvious. Take, for example, this attempt to add an article on someone named “Sam Hoza:"

Sam Hoza iz a stud. yezzir

("Sam Hoza," recorded on Data Blog at blogs.bgsu.edu/wikipediadata/2008/10/22/sam-hoza)

Clearly, this sort of petty vandalism, the equivalent of scratching one’s name onto the digital wall that is Wikipedia, can be speedily deleted by a Wikipedia admin without any real need to do much research work.

However, other articles that were Speedy Deleted under CSD - A7 during the test period are not so clearly lacking in claims of importance or significance. Take for example, this attempt, also deleted under CSD - A7, to write an article on a Kurdish Artist named “Hozan Kawa”

Hozan ‘Kawa’ is a very popular Kurdish artist. He has a great love for Kurdish
songs and poems. Kawa was born in a small place around Kurdistan of Turkey, instead (Palas) related to the city (Mûshe). The city is famous for artists as Zeynike, Shakiro, Resho, Hüseyine Mûshe and many other people.

His mother (Guleya Elif) said to him one day. Son after my death, I want you to remember never forget: If you want me to be proud of you and you lift my head up, where I shall love you. You must introduce the beautiful voice for the Kurdish people. They will never forget you and there you will be a legend in Music.

He has 11 siblings in her family. His father did many services to help him. He was a strong piece of ‘Kawa’ who would succeed to become a great artist.

‘Kawa’ started his studies in Kurdish. Besides his studies he began to learn Turkish. In Kawa’s world, he further in music. He really invested everything to be a professional Artist.

1987 in the city (Mûshe), did he started a music group in the process to a large and useful artist carrier.

In 1995 he traveled to Europe and the country France. After a week in France, he started his career artist. In Newroz (1996) he was known by the group (Berxwedan). Now among the Kurdish, he is a big familiar face.

Between group Berxwedan he began to make his first album by the name ‘Ava Evine’. His album came out in the year 2001. After that he published his second album ‘Taya Dila’.

Kawa eventually also gave the third album ‘Ez ú Tu’. His second and third albums did make him to a amazing great artist. His voice is gold worth listening
to. It’s just really fantastic for our Kurdish opinion.

‘Kawa’ has released the fourth album also more information about it coming later

[Spelling and punctuation from the original](“Hozan Kawa,” recorded on Data Blog at blogs.bgsu.edu/wikipediadata/2008/10/22/hozan-kawa).

This article clearly makes a claim as to its subject’s significance. It claims its subject is a “popular Kurdish artist.” Clearly, the administrator who deleted this article had to make a judgment call as to whether or not this claim was to be taken seriously. That is to say, he or she had to make a judgement call as to the whether or not Hozan Kawa was, in fact, a notable Kurdish artist. Technically, such a decision would fall outside the letter of CSD-A7 and call for the more deliberate deletion process. However, given the perceived need of Wikipedia editors for a rapid means for deleting what they see as “vanity pages” posted by musical groups, authors, artists, and others, it is perhaps not surprising to see CSD-A7 pressed into service as a mechanism for Speedily Deleting articles of these sorts deemed not notable.

It is here that the use of search engines enters the picture. There is considerable evidence that Wikipedia editors employ search engines to establish notability for a given topic. Wikipedia guidelines both condone this practice, and give recommendations for its use. Two of the suggested uses of “Search Engine Tests” for policing articles on Wikipedia, as given by Wikipedia’s “Search Engine Test How-To Guide” are:

3. *Genuine or hoax* - Identifying if something is genuine or a hoax (or spurious, unencyclopedic)

4. *Notability* - Confirm whether it is covered by independent sources or just within its own circles (“Wikipedia:Search engine test - Wikipedia, the free
encyclopedia,” 2008).

Since many articles were deleted under the auspices of CSD-A7, and since this speedy deletion criteria is explicitly listed as a proper use for “search engine tests” by Wikipedia guidelines, it seems reasonable that testing using Google and other search engines might play an important role in informing the decision making process administrators are using in many of these cases. This is especially so given the short period of time Speedy Delete decisions are often made in, making the rapid information retrieval made possible by a search engine even more attractive.

A further 17 articles were deleted under CSD-G12, which is to be used for cases of “blatant copyright infringement.” Detecting such infringement is another of the suggested uses of Search Engine Tests listed in the how to guide, and the use of search engines was suggested by Jimmy Wales as long ago as 2001 as a means of discovering copyrighted material being inserted into Wikipedia. Thus, it is not unreasonable to believe that in some cases Wikipedians are using Google exactly as Arno describes, as a quick and dirty check of an article’s worthiness for inclusion in the encyclopedia.

We can see that many Speedy Deletes may be informed by the use of search engines. While in some of these cases Speedy Deletes may occur because Google suggests the subject of an article “does not exist,” in other cases it may be that Google results simply imply the subject’s existence is not important enough to deserve listing in an encyclopedia. This hints at the possibility that users are employing Google and other Search Engines in a somewhat sophisticated way, rather than as a blunt instrument "test for existence" as Arno's analysis implies. This is borne out by evidence gleaned from Wikipedia's other article deletion
procedures.

Speedy Deletion is, as I have already mentioned, not the only way to remove an article from the Wikipedia. There also exist two other deletion procedures, both of which are designed to allow for a more deliberative deletion process. One of these processes is known as "Proposed Deletion" and usually abbreviated onsite, in the way so many things in the Wikipedia world are, as PROD. In the Proposed Deletion process, articles that any editor believes should be deleted are "tagged" with a special template (that is to say, the template code is added to the article). This template displays a large, red warning box at the head of the article and provides space for the editor proposing deletion to list his or her concerns with the article, as well as information about the deletion process. If another editor objects to the article being deleted, he or she may remove the template. The template asks that an objecting editor also document his or her concerns on the article's talk page, though in practice this does not always happen. If the template remains on the article for five days without being removed, any administrator may then delete the article.

Of the new articles created on October 1-2 2008, I was able to find evidence that 19 were involved in the Proposed Deletion process at some point. Of these, one article showed direct evidence of having been deleted based on evidence provided by a search test. Five others listed "notability" concerns as at least part of the reasoning behind the proposal for deletion. However, the quantitative data here are probably not very good. Deletion Proposals may be added to an article at any time and, if the proposed deletion is contested, later removed without leaving any evidence that could be found without an exhaustive review of the article history. I was not able to conduct such investigations on the articles captured for my data blog. Therefore, it is possible that other articles in the data set may have been marked as proposed for deletion without my
knowledge. Furthermore, not every article deleted after a proposed deletion lists the concerns that initially prompted the deletion proposal in the deletion logs, thus information on these concerns was lost when the page was deleted.

These difficulties aside, the qualitative data provided by the deletion concerns I was able to recover are interesting. The one article proposed for deletion that has evidence of search test use in the comments recorded in the deletion log shows evidence that a variety of non-Google specialized search engines may be employed by Wikipedia editors for search tests. The comments section of the entry in the deletion log for the article titled "Count von count band" reads: "WP:PROD, reason was 'Band with three EPs and no other claim in article of meeting WP:MUSIC. No hits at metacritic; no listing at allmusic.'" ("Count von Count band log file," n.d.). This comment states that this article on a musical group was deleted based on a proposed deletion (WP:PROD - for Wikipedia Policy: Proposed Deletion) because an editor felt it did not satisfy Wikipedia's guidelines for what constitutes a "notable" musical artist or group (the shorthand for this is WP:MUSIC). Among the arguments forwarded to support this are a search test, specifically, the editor notes that this band name does not yield results when he or she searches the specialized Metacritic and Allmusic search engines, which are dedicated to tracking large databases of information regarding popular music. This demonstrates that Google is not the only search tool utilized by Wikipedia editors. It also demonstrates that Google is not the only large corporate player providing tools that Wikipedia editors find valuable, as Metacritic and Allmusic are owned by CBS interactive and the Macrovision corporation, respectively.

To expand on the limited data on the proposed deletion process provided by my initial examination of new articles created on October 1-2 2008, I examined articles listed as being
subject to a Proposed Deletion on March 5, 2009. Articles that have the Proposed Deletion
template added to them are added to a Wikipedia category, gathering them on a single page for
easy inspection, at least until such a time as the template is removed or the page is deleted. When
I first accessed the page at 19:40 UTC on March 05, 2009 73 articles were listed as proposed for
deletion. Of these, six possessed Proposed Deletion tags that listed a lack of search results as part
of the reason the article should be considered for deletion. Four of the six indicated that Google
was the search engine employed in the search test, two of these provide links to the relevant
Google results so other editors can confirm the findings. One editor went through the trouble of
providing links to not only the standard Google search results, but also the results for Google
News, Books, and Scholar searches. The presence of these six clearly search-related deletion
proposals establishes that search engine use played at least some role in the Proposed Deletion
process. Furthermore, they represent a lower bound on the number of Proposed Deletions played
a role in, since other editors may have considered search engine based evidence without citing it
explicitly in the deletion proposal.

These six articles provide more evidence that search testing plays a key role in
establishing that a topic has sufficient "notability" to be the subject of a Wikipedia article. In five
of six cases in which editors proposed deletion for articles because of a lack of search results,
they explicitly stated they were concerned that the subjects of these articles were not notable. In
the sixth case, an article purporting to describe a condition called "Samms disease," the editor
proposing deletion writes, "no medicine related links turn up on a Google search with the title.
Please provide reliable references." This comment does not make explicit why the editor finds a
lack of Google results to be reason to delete the article, but strongly suggests he or she feels that,
in the absence of references provided within the article itself, the lack of Google search results might indicate a hoax. The link between notability and Google search results is made most clearly by the editor proposing that the article on St. Peter's Syrian Orthodox Church, Auckland be deleted. This editor writes, "A search for references has failed to find significant coverage in reliable sources in order to comply with notability requirements. This has included web searches for news coverage, books, and journals, which can be seen from the following links," and then proceeds to provide links to the search results for the string "St. Peter's Syrian Orthodox Church, Auckland" on Google's standard web search, as well as Google News, Books, and scholar. The editor then goes on to conclude, "Consequently, this article is about a subject that appears to lack sufficient notability." Of the 73 articles proposed for deletion on March 5, 2009, 47 list concerns about the notability of subjects as at least part of the reason the articles were being considered for deletion. Given the evidence that editors are, in fact, commonly using search tests to establish notability for a given subject, Google and other search engines probably have played a role in many more proposed deletions.

Besides Speedy Deletion and Proposed Deletion, there is a third, even more deliberative and time intensive process for removing Wikipedia articles. This third and most formal deletion process involves the article being Nominated for Deletion, at which point a section will be created for the article on the page listing articles being considered for deletion (AfD - Articles for Deletion). On the AfD page, editors will debate the relative merits of either keeping the article on Wikipedia, or deleting it. This debate is often extensive and can be dense with Wikipedia shorthand, jargon, and abbreviated references to Wikipedia policy pages. This debate, Wikipedia policy tells us, is an attempt to reach "rough consensus" rather than a "majority
In practice, this means that administrators have considerable latitude to consider the relative merits of arguments made for or against deletion by various editors, rather than being bound to simply follow majority opinion. When an administrator determines that consensus has been reached, he or she will “close” debate on the AfD page as either “Keep” (to retain the article) or “Delete” (to remove it), ending debate. This administrator will then go on to carry out deletion of the page if necessary.

Google and other search engines clearly play an explicit role in many debates on the AfD page. Of the about 30 articles that were Nominated for Deletion out of my sample from October 1 and October 2, 2008, 8 have AfD entries in which one or more editors cite Google or other search engine results as evidence for either retaining or deleting an article. This represents nearly a third of all articles nominated for deletion on these dates. In several cases, editors say they make use of Google Scholar, Google Books, Google News and other specialized search products in an attempt to find sources and either establish or discount notability for the subject of the article in question. In two cases, the shorthand “ghits” for “google hits” is used by editors. The presence of this shorthand demonstrates the pervasive use of Google derived evidence on Wikipedia.

Since AfD discussions are retained on Wikipedia indefinitely, the AfD process provides a rich supply of data with which I can easily expand my original sample to more extensively study the role of Google in AfD debates. The complete listing of all of the Articles listed for Deletion on October 1, 2008 gives 108 articles that were Nominated for Deletion on that date ("Wikipedia:Articles for deletion/Log/2008 October 1 - Wikipedia, the free encyclopedia," n.d.).
Of the 108 AfD debates listed, 35 include comments by editors that explicitly reference the use of Google search products as a means of establishing whether or not a given page should be deleted. Interestingly, only 5 AfD debates appear to include discussion of search testing that do not mention Google products, either by name or using the "ghits" shorthand. Looking at the AfD listings for first days of the remaining two months of 2008, November and December, suggests that the October 1 listing is fairly normal for this time period on Wikipedia. The November 1, 2008, and December 1, 2008, AfD listings give 99 AfD debates with 19 explicitly citing Google products and 119 AfD debates with 29 explicitly citing Google products, respectively("Wikipedia:Articles for deletion/Log/2008 December 1 - Wikipedia, the free encyclopedia," n.d.; “Wikipedia:Articles for deletion/Log/2008 November 1 - Wikipedia, the free encyclopedia,” n.d.). In both cases, only a handful of debates discuss search tests without invoking Google at some point.

These numbers would certainly seem to support the broad assertion that Google plays an important role in deciding if material on Wikipedia will be deleted or retained. About 1 in 4 of the 326 total AfD discussions listed on these 3 days had at least one editor invoke Google as evidence. To get a better idea of exactly what role Google was playing in these debates, I closely examined the arguments made by editors in the 35 AfD debates that explicitly invoked Google products in the October 1, 2008 AfD listing. Doing so demonstrates that, while Google clearly is an important element in the AfD process, editors are not simply counting Google hits to determine whether or not a given subject "exists," rather editors engage in a relatively sophisticated process of reading and interpreting the output of Google searches in the process of making their decisions.
Wikipedia editors may be guided in this process, at least in part, by a section of a Wikipedia essay entitled, "Arguments to avoid in deletion discussions" (“Wikipedia:Arguments to avoid in deletion discussions - Wikipedia, the free encyclopedia,” 2008). One Wikipedia editor involved in the AfD discussions of October 1, 2008, explicitly references the subsection of this essay which provides guidance on using Google to provide evidence for AfD debates. This section, which is subtitled "Google test,” provides Wikipedia editors with the following advice:

Although using a search engine like Google can be useful in determining how common or well-known a particular topic is, a large number of hits on a search engine is no guarantee that the subject is suitable for inclusion in Wikipedia. Similarly, a lack of search engine hits may only indicate that the topic is highly specialized or not generally sourceable via the internet. One would not expect to find thousands of hits on an ancient Estonian god. The search-engine test may, however, be useful as a negative test of popular culture topics which one would expect to see sourced via the Internet. A search on an alleged "Internet meme" that returns only one or two distinct sources is a reasonable indication that the topic is not as notable as has been claimed.

Overall, the quality of the search engine results matters more than the raw number. A more detailed description of the problems that can be encountered using a search engine to determine suitability can be found here: Wikipedia:Search engine test.
Note further that searches using Google's specialty tools, such as Google Book Search, Google Scholar, and Google News are more likely to return reliable sources that can be useful in improving articles than the default Google web search (“Wikipedia:Arguments to avoid in deletion discussions - Wikipedia, the free encyclopedia,” 2008).

Several things are significant about this language. First, the simple presence of a sub-section within this essay devoted solely to the "Google test," speaks to how important and prominent a tool Google is for Wikipedia editors. Not only is Google the only search engine mentioned by name in "Arguments to avoid in deletion discussions," it is the only source mentioned by name. The language provided here endorsing the use of "Google's specialty tools," can only serve to increase the influence of services like Google books and Google scholar within Wikipedia.

Second, "Arguments to avoid in deletion discussions," includes specific language attempting to dissuade Wikipedia editors from using raw Google hits as a means of establishing whether or not a given article should be retained on Wikipedia. Of course, this does not mean that editors never invoke Google hits in deletion debates. For example, an editor calling for the deletion of an article on "Magic Bars," writes, "No sources to indicate notability. All I could find on Google News were articles about bars where magicians work" (“Wikipedia:Articles for deletion/Log/2008 October 1,” n.d.). In another example, an editor suggested that an article on "cat repellers" be renamed to "cat repellants" as this term, "gets more G[oogle] hits" (“Wikipedia:Articles for deletion/Log/2008 October 1,” n.d.). However, the discussions often indicate that these arguments are not solely reliant on Google to determine the worthiness of a given article, but rather are connected to doubts editors have based on the text of the article itself.
In the case of "magic bars," the discussion indicates that the article was a recipe for a sort of food, raising doubts among Wikipedia editors that see recipes as outside the scope of Wikipedia's stated goal of encyclopedic knowledge production. In another case, an article on "Maxbashing" was nominated for deletion on the grounds of, "Fails Notability, Google yields few results. Written more as an advertisement rather than a substantial encyclopedic article"

("Wikipedia:Articles for deletion/Log/2008 October 1," n.d.). Here the article's advertisement-like tone (another editor calls the article "self-promotion") is cited as an important consideration, along with the lack of Google results.

Furthermore, the guidelines provided in "Arguments to avoid in deletion discussions," do a fairly good job of noting Google's biases (especially its propensity to give greater weight to recent popular culture) and advising editors where hit counting may or may not be useful. The discussions on the AfD list for October 1, 2008, suggest that editors are taking this guidance under consideration. Many of the AfD entries in which the mere fact of how many Google results a given subject returns is advanced as an argument for either deleting or retaining an article involve subjects drawn from recent popular culture, especially living artists and recently released or upcoming works of popular culture. In one particularly interesting example, an editor arguing for the deletion of an article on the Harvard University "Bionumbers" project writes that the article should be removed:

It appears to be a legit project run by a Harvard lab [...] and it seems to be creating some sort of a buzz based on plain google search results [...]. But as I understand it, the project is very new and was started in the Spring 2008. A more careful look at the google search result show that there is no sibstantial [sic] coverage yet by
Here, a Wikipedia editor is clearly arguing that raw Google hits may be unduly influenced by "buzz" about a very recent topic, and that this bias should be corrected for by a close reading of the search results.

There is one more interesting facet of the "Google test" language included in "Arguments to avoid in deletion discussions." This language is included in a section on "Notability fallacies," further demonstrating the link between search engines (especially Google) and Wikipedia editors' perceived need to establish that subjects are notable enough to warrant inclusion in an encyclopedia. This link is also reinforced by many discussions on the October 1, 2008, AfD list, which draw upon Google while engaging with the issue of notability. In fact, of the 35 discussions on the October 1, 2008 AfD page that explicitly reference Google, only 4 do not center around a debate over the subject's notability.

These deletion discussions also give important clues as to what might be driving Wikipedia editors' perceived need to establish that article subjects are sufficiently notable to merit inclusion in Wikipedia. After all, as Wikipedia itself notes, "Wiki is not paper," that is to say, the physical limits of what may be stored in Wikipedia effectively are much much less pressing than those of a traditional paper Encyclopedia. Unlike a paper Encyclopedia, Wikipedia need not worry about printing costs, how much space it takes up on a shelf, or the ability of readers to find information with only an index of subjects. Instead, Wikipedia is distributed through inexpensive digital means, and readers can use internal and external hyperlinks, Wikipedia's internal search engine, and the services of external search engines (like Google) to lead them to the information they need. Wikipedia's official policy, of course, limits this
theoretically endless ability to collect and organize information, in the typical flippant prose of Wikipedia policy, "Wikipedia is not an indiscriminate collection of information" ("Wikipedia:What Wikipedia is not - Wikipedia, the free encyclopedia," n.d.). The general guideline is that information on Wikipedia should be "encyclopedic," but since Wikipedia has already expanded to cover many topics ignored by traditional encyclopedias (such as the pages devoted to the major characters from the popular cartoon "Transformers") clearly the meaning of what is and is not "encyclopedic" is constantly being renegotiated by Wikipedia editors. These renegotiations create boundaries for Wikipedia's content, boundaries that are drawn by both the desires of individual contributors, and those of search.

The contents of deletion discussions suggest that the community of Wikipedia editors may be driven to police Wikipedia articles on the grounds of notability by their desire to establish and maintain Wikipedia's status as a reliable and accurate source of information. While they often cite notability concerns in deleting articles on subjects without a significant presence in reliable, third party news publications, editors are clearly also worried that such articles may be outright hoaxes. In one example, an editor arguing for the deletion of an article on a movie entitled "Tattoos: A Scattered History," writes that the entries on this movie on the IMDB (Internet Movie Database) should not be counted as establishing the movie's notability since:

> Anyone can add anything they want for IMDB. Someone once wrote that Saw IV would star Jessica Alba and feature Jigsaw's baby. That stayed up there for at least a week. If anything, it's worse than Wikipedia as it's a lot easier to remove false information from Wikipedia than it is for IMDB. On another note, having an IMDB entry doesn't equal notability...I can think of a lot of IMDB entries that if
they were to become articles on Wikipedia they would fail an AFD

While the nomination for deletion for this article cited concerns about notability, the editor above shows how these concerns connect to editors' attempts to guard against false information from remaining on Wikipedia. Notability becomes a means for editors to remove suspected falsehoods without violating Wikipedia's central "Neutral Point of View" policy, which holds that Wikipedia does not, by definition, present "one point of view as 'the truth'"("Wikipedia:Five pillars - Wikipedia, the free encyclopedia," n.d.). Instead of asserting that a given article is "false," editors may instead assert that it is simply not notable by virtue of its lacking a presence in large mainstream media sources.

In addition, editors seem to be particularly concerned with preventing Wikipedia from becoming a space in which small artists, businesspeople, and others promote their own projects using information that cannot be confirmed in reliable sources. Several debates on the October 1, 2008, AfD list use the term "Myspace musician" as a derogatory term to describe a musician who lacks recognition outside of self-promotional material posted on sites like the social networking site MySpace. One such case of self-promotional media being discounted is that of the article on "Carlos Sepuluveda" which was deleted after being nominated on the grounds that, "Clearly non-notable, as a google search turns up nothing aside from Youtube/blogs/Myspace" ("Wikipedia:Articles for deletion/Log/2008 October 1," n.d.). In another case, an editor writes that an article on the CRG West company should be retained despite the fact that "Much of the GoogleNews hits are press releases, which are not usually considered to count for notability,"
since, "there are a few gems buried within" (“Wikipedia:Articles for deletion/Log/2008 October 1,” n.d.). In these examples, we see Wikipedia editors attempting to prevent companies from influencing their coverage on Wikipedia by issuing press releases, and artists from influencing their coverage by self-promotion.

The above cases demonstrate one technique used by Wikipedia editors to critically read Google results; they scan these results for patterns suggesting self-promotion, such as the disproportionate presence within the results of press releases or information sources like MySpace or IMDB where subjects may be posting information about themselves. This ability of Wikipedia editors to read, rather than simply count, Google search results, tends to undermine some of Arno’s claims as to how Wikipedia editors use Google. In his article, he tells us that he intends to follow up on his original experiment, in which a hoax text was rejected from Wikipedia on the grounds that its subject lacked Google results. "Later on," he writes, "I’ll try to create another hoax. This time, I’ll make sure I use (fake) sources and there will be something about it to be found on Google. I have to use another computer, Wikipedia files your IP-address" (de Natris, 2008). Apparently Arno believes such a hoax will have a better chance of being retained on Wikipedia. However, since Wikipedia editors tend to discount the sort of Google results Arno would be able to generate (message board pages, social networking pages, blogs) it seems likely that these Google results would be disregarded and the hoax article would again be deleted. It is perhaps telling that Arno has yet to publish the results of this follow-up.

The ability of Wikipedia editors to read Google results critically guards against those who would attempt to insert false information into Wikipedia, even if would-be hoaxers were equipped with the sort of motivated network that might succeed in generating Google results. It
also guards against those who would attempt to crudely manipulate Wikipedia content for profit. This sort of manipulation is of concern to Wikipedia editors. The ability of editors to critically read Google results guards against this sort of manipulation of Wikipedia, since editors are checking for patterns in Google results, such as the overwhelming presence of press releases, promotional material, or material from blogs or other easily manipulated sites, which might indicate that a subject or someone hired by a subject was attempting to use Wikipedia for promotional purposes. Unless such an editor is able to produce reliable sources testifying to their significance, it does not seem likely that simply having prominent Google results would provide Wikipedia editors with sufficient evidence to retain an article.

However, while this protects Wikipedia from manipulation by for-profit and self-promoting editors, it also ironically ties Wikipedia to many of the traditional media organizations that it is often seen as being in opposition to. It is the presence or absence of these traditional media organizations within search results that often decides whether or not an article is deleted. For example, in successfully arguing for the retention of an article on the "Milwaukee Ale House," one editor writes, "there is detailed coverage of the pub in several books. [...] There is also substantial coverage in local newspaper, Milwaukee Journal Sentinel: 246 hits in googlenews [sic]" (Wikipedia:Articles for deletion/Log/2008 October 1). This reliance on traditional print media as a means for establishing notability is also seen in the widespread reliance on Google Books and Google Scholar within deletion debates, and the explicit approval given to these tools in the guidelines provided by "Arguments to avoid in deletion discussions."

While this reliance on print media may make Wikipedia more reliable, it may also prevent it from properly assessing the notability of artists and works of art hailing from some
subcultures. The best example of this found in the AfD list for October 1, 2008, is that of the article on a punk band known as "Bankrupt," which was deleted after a long and passionate discussion. The editor nominating the article for deletion writes, "I still believe the article fails WP:MUSIC because almost all of the links provided are for very niche type sites. Also, none of the albums the band has released have articles. They are on a minor label and haven't charted as far as I can see. I did a Google search but many were for entirely different bands called Bankrupt." An editor arguing for retaining the article attempts to refute these accusations writing:

Five new sources have been added, and quotes from reviews suggesting that the band also qualifies for notability criterion no.7. of WP:MUSIC

- 7. Has become the most prominent representative of a notable style or of the local scene of a city; besides - 1. It has been the subject of multiple non-trivial published works whose source is independent from the musician/ensemble itself and reliable

It is not stated here that the reference cannot be a "niche" publication. Several of these publications are considered as reliable sources in the punk community. Ox fanzine is the No.1 punk rock magazine of Germany.

I'll create pages for the band's albums. They may be on a minor label, but their recent releases are available worldwide on iTunes and Amazon.

Please note that a band is notable if it meets ANY of the notability criteria, therefore charting is not an obligatory criterion.

Regarding your argument of Google search: please do a search on last.fm. The only band called Bankrupt that comes up with over 15,000 listeners is this one.
You can also search MySpace for Bankrupt for similar results

These arguments, however, fail to convince the other editors, who continue to contend that these sources are unreliable, even after the above editor attempts to explain that, "Ox Fanzine has published 80 issues since 1988, and is the largest punk rock fanzine in Germany. Moloko Plus is another major German punk rock fanzine with over 30 issues released. Distorted Magazine from the UK is a very unique flash-based online magazine with over 20 issues published. Est.hu is a major Hungarian entertainment portal. Southspace.de, thepunksite.com, and kvakpunkrock.cz are all punk music portals with hundreds of reviews published, and having a significant readership. Also, Left Of The Dial (USA) was originally a respected print zine, before the author decided to go on as a blog” (“Wikipedia:Articles for deletion/Log/2008 October 1,” n.d.). One editor arguing for deletion writes, "Running a quick google search turns up the classic 'myspace own website irrelevant' results," suggesting that perhaps here the same critical Google reading skills used by Wikipedia editors to prevent for-profit and self-promotional articles might here be being used to discount sub-cultural sources in the absence of mainstream media acceptance. Ultimately, the article is deleted.

In addition to driving reliance on traditional "mainstream media," and, ironically enough, potentially discrediting sites using the same peer production methods as Wikipedia, the practices developed by Wikipedia editors to critically read possesses one more complicating feature worthy of mentioning. They sometimes rely on Google itself. Wikipedia editors who perform Google web searches for the subjects of Wikipedia articles are often confronted with many more Google results than a human being could realistically read. In one AfD discussion from October
1, 2008, one editor searching for sources establishing the notability of a board game called "Shuuro," writes that the term "returned 8,220 hits." Another editor rebuts, writing that, "got 8220 hits as well, most are all blogs and sanskrit language definitions"("Wikipedia:Articles for deletion/Log/2008 October 1," n.d.). The second editor seems to be claiming to have scanned the 8220 hits for false positives (apparently related to the similarly spelled word "Shuur," a surname) but it is difficult to see how this could have amounted to much more than the most cursory examination.

In some cases, Wikipedia editors rely on their ability to craft Google search queries to attempt to sort through these large numbers of results and find relevant information. For example, one editor recommends deleting an article on "Jonas Oslund" because, "supposedly wrote a quicksort program, but not only is he not mentioned in the Quicksort article, there seems to be no results for his name +quicksort in Google. Possibly a hoax, and non-notable in any case" ("Wikipedia:Articles for deletion/Log/2008 October 1," n.d.). Here, a Wikipedia editor has appended the subject's supposed area of expertise to his name in an attempt to filter for relevant information. In this example and others, Wikipedia editors show themselves to be quite competent at crafting search queries to better find the information they need. They are justifiably confident in their ability to skillfully use the search engine. While their skills may often serve them well, by using Google in the process of critically reading Google results Wikipedia editors make the nuances of Google's secret and ever-changing search algorithms, which determine how Google will respond to the associations of terms provided it by users, even more central to the process of determining what is and is not a legitimate subject of knowledge on Wikipedia. It is hard to blame them for this practice, however. It is made necessary by the sheer quantity of
information Google is capable of providing.

**Conclusion**

The above chapter demonstrates that the relationship between Wikipedia and major search engines, especially Google, is multi-faceted and complex. Understanding this complex relationship between these two important actors in the contemporary digital information environment, deepens our understanding of how we can best understand this environment in terms of communities and shared technological resources, rather than cyborg individuals. As I demonstrated in chapter three, the cyborg individual ideal grew out of an era in which hackers sought mastery over their individually owned computing devices. The realm of Free Software sought to maintain hacker's ability to treat their machines as property by rendering software as non-property. Today, however, the realm of “disembodied” information that hackers helped to construct has grown so vast and fast-moving that it outstrips the ability of any single cyborg individual to interpret it. Instead, Wikipedia editors and others must call on the resources of the large, centralized information utility that is the search engine in order to understand their information environment. The needs of these utilities shape the boundaries of Wikipedia, but they do not determine them. Instead, they interact with the needs of the Wikipedia editor community to set boundaries around Wikipedia content. These boundaries, ironically, sometimes privilege the “old media” that Wikipedia is often portrayed as being in opposition to.

In the next chapter, I continue my exploration of how the communities that make up Wikipedia are formed and negotiated. As I will show, just as Wikipedia editors are best understood as atomized cyborg individuals, nor are they a monolithic community. Instead a variety of communities call Wikipedia home. These communities may come into conflict with
each other, especially when the political conflicts of the larger world boil over onto Wikipedia.
CHAPTER SIX – A CASE STUDY OF THE CONTEMPORARY WIKIPEDIA: THE GAZA WAR ARTICLE

To this point, this dissertation has established how the early Wikipedia imagined itself in the terms of the ideal body of the Cyborg Individual, how Wikipedia is better understood in terms of collective action and shared resources, and how the need to manage collective action and shared resources has shaped Wikipedia policies and practices, including those involving the relationship between Wikipedia and the Google search engine. In this chapter, I will attempt to further describe the contours of collective action within Wikipedia through a detailed study of a single particularly contested Wikipedia article: the Wikipedia article documenting the 2008-2009 war in the Gaza strip. This study has two goals. First, it looks to shed some light on the forms of control that function within Wikipedia itself, intrinsic to the process through which Wikipedia editors negotiate their communal form of production. Second, it will attempt to take into account the insight, so central to cultural studies, that power relationships within a society do not map neatly to the relationships of production, but rather extend along many more (often ambiguous) axes of political conflict.

My investigation of the Gaza war article connects to my prior discussion of Wikipedia, peer production, and the cyborg individual in several ways. As I established in chapter four, Wikipedia editors are not best understood as technologically empowered cyborg individuals free to pursue their own innate desires, but as members of a community based around shared physical hardware and productive goals. The boundaries of this community matter for Wikipedia's content. In this chapter I will continue my exploration of the boundaries of the Wikipedia community. I will demonstrate how Wikipedians work to exclude editors they see as disruptive
while working to build community consensus on politically fraught topics. This process of exclusion and negotiation serves, ironically enough, to both permit Wikipedia to present a diversity of positions on politically fraught topics and to limit this same diversity. Chapter four also established how concerns over the supply of volunteer labor helped to shape Wikipedia policies like the NPOV. The case of the Gaza war article demonstrates how concerns about labor continue to play an important role in the decisions made by administrators and editors on Wikipedia. Furthermore, the example of the Gaza war article shows that the Wikipedia community cannot simply be understood as one monolithic pool of “free labor.” Instead, the community is split into sub-groups and factions, which are in constant negotiation with one another. These negotiations play an important role in setting boundaries around Wikipedia’s content and community.

The Gaza war article is a particularly attractive candidate for a case study because of the high volume of heated debate that this article generated. This is perhaps because the article was written as the politically fraught events it describes were still unfolding. The Israeli air force began a renewed campaign of air attacks in the Gaza strip on the afternoon of December 28, 2008. Within hours of the initial Israeli air strikes, Wikipedia editors had begun an article describing this conflict. This article grew from a single sentence (“Gaza War - Wikipedia, the free encyclopedia,” 2008a) to a substantial article (“Gaza War - Wikipedia, the free encyclopedia,” 2008b) in less than 24 hours, and rapidly became a heavily edited and hotly debated space within Wikipedia. The conflict would escalate over the coming weeks to an invasion of Gaza by Israeli ground forces, and a renewed bombardment of cities in southern Israel by Hamas rockets. By the cessation of this episode of active hostilities in the Gaza strip, on
January 18, 2009, the article had been edited nearly 7,000 times and had generated the equivalent of hundreds of printed pages worth of discussion between editors on its Talk page. Discussion and editing continued at a slower pace for weeks, and in fact editing activity on the article had picked back up again around the time this chapter was initially drafted, in September of 2009. This chapter will deal with the process of revising the article describing the military activity in the Gaza Strip in the winter of 2008-2009 and the debates associated with this editing process for the time period spanning from the creation of the article through June 2009, when the article settled into a somewhat stable form. In writing this account of that process, I have drawn off of all relevant and available Wikipedia materials, including the article's revision history, its talk pages, user pages of editors involved in creating the article, pages documenting relevant Wikipedia policies, and pages recording administrative decisions and other discussions associated with this article. During this chapter, I will refer to the editors involved in the production of the Gaza war article by their Wikipedia screen names, which are sometimes a bit unorthodox, in order to clearly describe the editing activity in a straightforward manner.

The case provided by this article is useful for exploring the boundaries of collective activity Wikipedia for several reasons. First, the extensive discussion and editing activity associated with this article, which I will refer to as the “Gaza war article” provides a source of data rich in details of the process used by Wikipedia editors to create and refine articles, but a source small enough to be completely read and understood by a single researcher in a reasonable period of time. Second, articles documenting the Israeli-Palestinian conflict have been recognized by the larger Wikipedia community as particularly contentious, and are subject to special sanctions and attention by site administrators, and thus the article in question has ample
evidence of documenting the function of regulatory agencies such as the Arbitration Committee (ArbCom), which are larger than a single article but still internal to Wikipedia. Finally, and most importantly, the politically fraught subject of this article provides an opportunity to study how Wikipedia editors behave under politically tense conditions, and what the concrete political implications of the collective activity of Wikipedia editors might be.

Bounding the Community From Above: Admin Actions in the Gaza War Article

The early Wikipedia prided itself on its radically egalitarian structure, in which no editor exercised formal power over others. This open and egalitarian format was endorsed by users, like Bryce Harrington who chose to migrate to Wikipedia, rather than Nupedia, from the failed GNUpedia project because they found Nupedia's model of strict editorial control too stifling. This egalitarian model was further reinforced by the departure of Larry Sanger who had, much to the chagrin of some of the more anarchist-aligned Wikipedia editors, attempted to exercise a modicum of editorial control over the project. However, dreams of a totally egalitarian project, in which no user exercised formal control over others, quickly frayed. As early as October 2001, well before Sanger's departure, Wales and other prominent users engaged in a discussion on the Wikipedia-L list concerning adding features to the new Wiki software then being developed for Wikipedia (the basis for today's Mediawiki software) that would allow editing activity to be more closely monitored and controlled. Wales, in the initial post in the thread, notes the recent activity of a "prankster" who had inserted "references to a 'secret Arabic language'" linking to a pig latin dictionary to an article on "Muslim language" (Wales, 2001n). Wales suggests that Wikipedia would be improved if the software enabled editors to easily check track edits by a particular user, since this would allow for other activity by this "prankster" to be revealed. In the
ensuing discussion, a variety of possible features and control mechanisms were discussed, including a plan proposed by Wales and endorsed and refined by several others that would have given experienced editors, who Wales sarcastically dubs "cabal members," formal powers such as "like locking and unlocking the Home Page, or placing a temporary block on an IP address or UserID" (Wales, 2001).

This system of formal powers for some trusted users is indeed what has emerged over the course of Wikipedia's development. Unlike Wales' initial proposal, not all of these privileges are automatically granted by software, some require the active blessing of the community. There are today several levels and varieties of editor privileges on Wikipedia, all overseen (more or less) by the guidance of the Wikimedia Foundation board, which is in turn selected (in part) by the results of elections in which all active editors (in the 2008 election, the threshold was 600 edits to a foundation project) may take part. Technical privileges that may be assigned to editors include the ability to access forms of information hidden to other users (including IP information for registered users and deleted articles), the ability to delete articles from Wikipedia, the ability to protect or semi-protect an article (more on what this means later), and the ability to block or otherwise restrict users from editing Wikipedia. Technical privileges can be grouped into several categories, as shown in figure one. The largest group of users with technical privileges on Wikipedia is the Administrators group, who "can protect and delete pages, and block other editors" ("Wikipedia - Wikipedia, the free encyclopedia," 2010). Other groups of interest are granted social, rather than technological privileges, and are empowered to make decisions the rest of the community are expected to abide. The most important of these is the Arbitration Committee (ArbComm), "a panel of experienced users that exists to impose binding solutions to
Wikipedia disputes that neither communal discussion, administrators, nor mediation have been able to resolve."

Interventions by both Administrators and Arbitrators helped to shape the Gaza war article. Administrators acted to limit certain editing activity on the article, both by protecting the article as a whole and, in some cases, by blocking disruptive editors. Arbitrators intervened by sanctioning editors for disruptive or abusive behavior reported by their fellow Wikipedians, prohibiting them from editing the article or even articles in the larger subject area of the Isreal-Palestine conflict or face administrator action. We can divide interventions into two broad categories, those that regulated activity on the article as a whole, and those that served to limit the activities of particular users. In all cases, Administrator and Arbitrator action served primarily to set the boundaries of the editing community working on the Gaza war article.

**Article Protection: Setting the Default Community**

Just as Wikipedia has grown to include a variety of groups of users with various levels of technical privileges, so too it has developed a variety of controls that can be placed on editing activity on a particular article. These are known as forms of "article protection," and are listed and explained on Wikipedia’s Protection policy page (“Wikipedia:Protection policy - Wikipedia, the free encyclopedia,” 2010). For the purposes of this chapter, the most important forms of protection are full protection, semi-protection, and move protection. Full protection prevents anyone who is not a Wikipedia administrator from editing the page, and even administrators are warned against doing so without establishing consensus for their changes on the article’s talk page. Semi-protection prohibits users without accounts on Wikipedia (known as "anonymous editors" or "IP editors"), or users who have only very recently acquired Wikipedia accounts from
editing the page. Move protection prevents anyone who is not an administrator from moving the article to a new title (“Wikipedia:Protection policy - Wikipedia, the free encyclopedia,” 2010). In each case, article protection changes the boundaries of the community of editors who are able to edit the article or, in the case of move protection, changes the privileges extended to the editing community. I will discuss the role of move protection later in the chapter, when I investigate the debates that ensued over the title of the Gaza war article. In this section, I will focus on the role of full and semi protection in the development of the Gaza war article. Investigating the role of these two forms of protection in the development of the Gaza war article suggests that administrators are balancing the relative benefits and drawbacks of a larger or smaller pool of potential volunteer labor for an article as they decide on the article's protection status.

It is notable that, despite the fact that the Gaza war article was almost immediately a source of contention and debate among Wikipedians, as well as so much editing activity that some involved editors reported being unable to navigate the page history or talk page successfully, the Gaza war article was not put under full protection during the study period. The only apparent mention of the possibility of such an act preserved in the archives of the talk pages occurred on 15 of January 2009, when (appropriately named) administrator Stifle left a warning on the talk page reading: "This page is very close to getting protected for edit warring. Please make sure to discuss edits here" (“Talk:Gaza War/Archive 18 - Wikipedia, the free encyclopedia,” 2009). The possibility of protecting the page is almost immediately opposed, with user Tiamut posting the following objection only three minutes after the warning is posted: "I don't think edit protection is needed. That will simply stifle article development." Tiamut's complaint that full protection, will "stifle development" suggests that the involved process required for editing a
protected page, preemptively establishing consensus and then getting an administrator to make the desired changes was understood to have the price of drastically slowing the editing activity on the article. In mid-January 2009, the events the Gaza war article describes were still unfolding, so it makes sense that editors would not want to see the pace of updates slowed. Indeed, after the close of the study period, in November 2009, the page would receive full protection due to edit warring. By this time however, the page had settled into a stable form, making the lack of "development" incurred through full protection less pressing. In fact, no edits were made to the page during the period of full protection, from November 8, 2009 to February 2010. Concerns about limiting productive activity on the article, then, seem to have driven the decision not to apply full protection during the study period.

Discussions surrounding semi-protection of the Gaza war article also suggest that administrators based their decisions to protect or unprotect the article on how that decision would affect the productive activity occurring on the page. Unlike full protection, semi-protection was often applied to the Gaza war article during the study period. In fact, the article was first semi-protected only shortly after it was created, on December 29, 2008 ("Wikipedia:Requests for page protection - Wikipedia, the free encyclopedia," 2008). The semi-protection is requested by user Okedem, who gives his reasoning for the request as, "vandalism, in the news, multiple, rapid, anon vandalism acts. Speed and size of article make it difficult to defend." Admin SoWhy grants Okedem’s request and semi-protects the article about a half an hour later. Only ten minutes after the semi-protection status was granted, another editor commented on the Gaza war articles talk page, supporting the decision to semi-protect and writing, "I agree with SoWhy's decision to semi-protect this; someone was making edits that greatly compromised the neutrality of this
article, and in my opinion people will continue to do so” (“Talk:Gaza War/Archive 1 - Wikipedia, the free encyclopedia,” 2009). This editor stresses how semi-protection is seen as useful in maintaining article neutrality, which was an important value stressed throughout discussions of the Gaza war article. In a response to this comment, Okedem states that, prior to the semi-protection, he/she was "reverting more edits than I should." Taken together with Okedem's complaint that the article was "difficult to defend" due to its size and the speed at which editing was taking place, this comment suggests that semi-protection is seen as a good way to conserve the time and effort of editors, who might otherwise be swamped with the task of cleaning up after anonymous vandals. SoWhy adds to the discussion, noting that, "I think we can stop short of full protection at the moment," to which Okedem agrees, stating, "Full protect of an ongoing event would really be a shame." This suggests semi-protection is seen as a better alternative to full protection, as it still permits a relatively large pool of editors to contribute to the article, allowing Wikipedia content to keep up with changing current events.

Discussion surrounding later episodes of semi-protection for the Gaza war show admins and editors explicitly weighing the potential positive contributions of anonymous editors against the effort required to clean up after anonymous vandals as they decide whether or not to apply semi-protection to the article. On January 12, the initial period of semi-protection applied by admin SoWhy expired. Soon after, on January 13, editor Cynical requested that protection be restored, writing that protection was required because of, "vandalism, Persistent vandalism/POV pushing by unregistered users," and suggesting that admins "Semiprotect until a ceasefire is agreed and it [the Gaza war] stops being news" (“Wikipedia:Requests for page protection - Wikipedia, the free encyclopedia,” 2009a). Admin Caknuck responds to the request for semi-
protection by writing, "I'm torn on this one. On one hand, there is some IP vandalism going on. There are, however, a number of positive and otherwise good faith contributions from IPs." Caknuck ultimately decides that the volume of vandalism attributable to some anonymous editors (sometimes called “IP editors” because the Wikipedia software identifies these editors by their numeric internet address, or “IP number”) is not sufficiently large to merit closing down the productive contributions coming from other anonymous editors. This decision is informed by a comment made by editor Tanthalas39, who argues, "I wouldn't [semi-protect the article]. There's not an IP edit in the last 50 diffs." (“Wikipedia:Requests for page protection - Wikipedia, the free encyclopedia,” 2009). This apparent low volume of anonymous vandalism makes Caknuck decide that semi-protection is not worth limiting the editing community available to the article.

Editors working on the Gaza war article, however, are unhappy with this decision, as they perceive anonymous vandalism as an ongoing problem. On January 16, semi-protection was again requested. This request was made by editor Cerejota, who had been a very active and well-respected participant in the Gaza war article to this point. Cerejota argues, "Every time semi-protection gets removed, a flurry of anons comes in to do mostly vandalic [sic] edits. Some anon edits have also raised suspicions of puppetry." (“Wikipedia:Requests for page protection - Wikipedia, the free encyclopedia,” 2009b). Again, admins are initially unconvinced that the volume of vandalism warrants protection. Admin Oren0 writes: "after looking at the last few hundred edits I'm unconvinced [of the need for semi-protection]. In the last 250 edits, I see ~3 or

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12 “diffs” here refers to edits made to the article (short for "differences")

13 “Puppetry” refers to the practice of using multiple accounts or IPs to create the illusion that a position enjoys more editor support than it actually does. This practice is banned on Wikipedia, and considered a major offense.
4 IP edits that have been undone by anyone and a slightly larger number of IP edits that appear at a glance to be constructive." We clearly see here how Oren0 is balancing the effort of reverting anonymous vandalism against the effort provided by constructive anonymous editors. Editor Timeshifter argues that Oren0 has miscalculated the true impact of anonymous vandalism writing, "500 edits is only a day and a half of editing. Check it out. The anonymous IP edits happen in spurts, and can cause frustration and chaos for hours until partially repaired." In this response, Timeshifter stresses the "hours and hours" labor required to clean up after anonymous vandals. Oren0 reconsiders and applies the semi-protection.

It is clear that semi-protection was seen as an effective way to balance the need to protect editors of the Gaza war article from wasting their time reverting destructive edits, without too-strictly limiting the editing community and cutting off development of the article altogether. Just as concerns about securing Wikipedia's volunteer labor supply influenced the language of the NPOV, these same concerns serve to inform how administrators apply article protection to contentious articles today.

By limiting the editing community of controversial articles to those editors with established Wikipedia accounts semi-protection serves to hold editors working on these contentious issues accountable to community standards. Unlike anonymous editors, who can change IPs or disappear entirely, editors with established accounts are subject to surveillance and discipline. Unlike the hackers described in chapter three, who escaped the ability of both bosses and ordinary users to observe and influence their behavior by building individually owned machines, Wikipedia editors must submit themselves to the shared values of their shared technological embodiment. Unlike Jaron Lanier, I do not believe that this leads to a crushing
“digital maoism,” but rather to a process of community negotiation that has both progressive and reactionary elements.

**Disciplining Individual Editors: Arbitrator Action in the Gaza War Article**

The current version of the Mediawiki software employed by Wikipedia allows for the sort of tracking of editor behavior that Jimmy Wales wished for in his 2001 post to the Wikipedia-L list discussed above. Simply by clicking on the link reading "user contributions" on the left hand side of any editor's user page, anyone can view a list of that editor's recent activity on Wikipedia. In addition, a link labeled "logs" will display a list of other information recorded in public logs about the editor, including the time and date of the creation of his or her account, any occasions on which the editor has been banned from Wikipedia, file uploads the editor has made, and other changes in the editor's user status (including promotion to admin status). All of this renders Wikipedia a space of almost perfect surveillance for registered users, everyone can see what everyone else is up to. This surveillance cuts in many directions; in some famous cases Jimmy Wales has been caught making edits to pages that the community found illegitimate, and called to account. In addition, some administrators, those with access to what is known as the Check User tool, can also view editors' IP address information. This allows them to establish a rough correlation between user accounts and real-world individuals. Being able to tie Wikipedia accounts to real-world bodies is seen as necessary to avoid the problem of Sock-puppetry, the practice of a single individual registering for multiple Wikipedia accounts in order to artificially inflate support for their position in an editing dispute, avoid a prior editing ban, defeat the rule against a single user reverting (or changing back to an earlier version) an article more than three times in one day, or otherwise circumvent Wikipedia policies.
In the case of the Gaza war article, surveillance of involved editors was particularly focused. Roughly a year before the creation of the Gaza war article, in January of 2008, editors working on articles concerning the Israeli-Palestinian conflict approached the Arbitration Committee to request that special attention be paid to articles in this subject area. In a statement supporting the request for arbitration, editor Ryan Postlethwaite\textsuperscript{14} describes the need for arbitrator intervention this way: "the battles that are going on at Palestine/Israel articles are now getting out of hand and the community is no longer able to handle them. [...] Despite there being discussion on talk pages, the parties insist on edit warring [...]. [...] What it boils down to is severe ownership issues from certain members of the dispute, and an unwillingness for parties to make compromises and stick with consensus" ("Wikipedia:Requests for arbitration/Palestine-Israel articles - Wikipedia, the free encyclopedia," 2008). Seven other editors also file comments on this request, concurring with Ryan Postlethwaite's request for arbitration. One editor leaves a comment objecting to his or her inclusion on the list of "involved parties" provided by Postlethwaite, but mute on the issue of whether or not the Arbitration committee should take up the issue. Only one editor, user Jaakobou, who had been singled out by Postlethwaite and others as a particularly egregious edit warrior, files a comment objecting to Arbitration in this case. On January 10, 2008, the Arbitration committee agrees to consider the matter.

On January 19, 2008, the Arbitration committee released its findings. They call for a series of remedies for the issues surrounding not only articles related to the Palestine-Israel conflict, but "a broader set of conflicts prevalent over the entire range of articles concerning the Arab-Israeli conflict," which, they write, "are grounded in matters external to the project; deep-
seated and long-standing real world conflicts between the peoples of Palestine and Israel [that] have been transferred to Wikipedia." In order to prevent these real-world conflicts from disrupting Wikipedia editing activity, the arbitration committee calls for the imposition of discretionary sanctions on the topic area. This effectively allows, "any uninvolved administrator," to, "on his or her own discretion, impose sanctions on any editor working in the area of conflict if, despite being warned, that editor repeatedly or seriously fails to adhere to the purpose of Wikipedia, any expected standards of behavior, or any normal editorial process." The list of permissible punishments admins may employ under these sanctions includes, "blocks of up to one year in length; bans from editing any page or set of pages within the area of conflict; bans on any editing related to the topic or its closely related topics; restrictions on reverts or other specified behaviors; or any other measures which the imposing administrator believes are reasonably necessary to ensure the smooth functioning of the project." The arbitration committee also calls for the creation of a "working group, composed of experienced Wikipedians in good standing," that would be responsible for, "developing a comprehensive set of recommendations for resolving the pervasive problem of intractable disputes centered around national, ethnic, and cultural areas of conflict." The committee goes on to formally remind editors that, "when editing in subject areas of bitter and long-standing real-world conflict, it is all the more important to comply with Wikipedia policies," and suggests, "editors who find it difficult to edit a particular article or topic from a neutral point of view and adhere to other Wikipedia policies are counseled that they may sometimes need or wish to step away temporarily from that article or subject area."

The decision of the Arbitration committee on Palestine-Israel Articles (now known by the distinctly Wikipedian abbreviation Wikipedia:ARBPIA) suggests that arbitrators saw better
policing the boundaries of the editing community involved on contentious articles as the most
direct and effective way to handle the potential for these articles to disrupt Wikipedia. The
discretionary sanctions imposed give admins a free hand to require editors seen as disruptive to
cease and desist editing activity. By authorizing admins to impose topic area bans, the committee
provided them with the means to limit behavior seen as disruptive and, in the words of one
commenter, lead to "project resources being squandered," without necessarily preventing
affected editors from contributing to the project elsewhere, in fields where their contributions
might be more productive. Their advice that, "[those] who find it difficult to edit a particular
article or topic from a neutral point of view," voluntarily remove themselves from the topic area
also encourages this conservation of productivity. In contrast, the Arbitration committee notably
did not decide to impose remedies that might have more directly intervened in the process of
content creation, such as the idea proposed by one editor that called for the creation of "a style
guide or naming convention," that would deal with issues such as, "the use of the term
"occupied" to describe the territories which came under Israeli rule in 1967." They may have
meant for recommendations on matters such as this to come from the proposed working group,
but the final report from this body failed to do so, and instead also focused on bounding the
community of editors ("Wikipedia:Working group on ethnic and cultural edit wars/2008 report
- Wikipedia, the free encyclopedia," 2008). As we will see below, the Arbitration committee's
decision to avoid intervening directly in the process of content creation meant that important
decisions about the content of the Gaza war article would be resolved by a process of negotiation
among members of the editing community, rather than imposed from above.

Editors working on the Gaza war article showed awareness that they were working under
the increased scrutiny of administrators. Early on December 28, editor Cerejota adds the
Sanctions template to the talk page of the article, which informs editors that, "This article and its
editors are subject to Wikipedia general sanctions" (“Talk:Gaza War - Wikipedia, the free
encyclopedia,” 2008a). In the accompanying edit summary, Cerejota writes, "Yeah people, a
gentle reminder that you will be banned for disruption as per general arbcom discretionary
actions." This addition is reverted moments later by editor (and admin) Tariqabjotu, who
expresses displeasure with Cerejota's action with the edit summary, "please, don't patronize us."
Cerejota, however, returns the tag to the page less than two hours later, this time including a link
to the page and a comment embedded in the code of the page (that is to say, viewable to those
editing the page but not those simply viewing it) reading in part, "PLEASE DO NOT REMOVE "sanctions" TAG," and "EVEN WITH NO TAG THE SANCTIONS ARE STILL ON, SO DO NOT REMOVE" (“Talk:Gaza War - Wikipedia, the free encyclopedia,” 2008b caps in original).
This warning would remain on the talk page for the remainder of the study period. Additionally,
editors indicate in discussion with one another on the talk page that they know they are under
scrutiny because of the WP:ARBPIA decision. In objecting to Tariqabjotu's comparison of the
Gaza war to the U.S. Invasion of Grenada during the course of a debate about the article's title on
January 2, editor RomaC writes, "the Grenada-US articles are not under general sanctions,
Israeli-Palestinian articles are, because editors have repeatedly gamed the system" (“Talk:Gaza
War/Archive 4 - Wikipedia, the free encyclopedia,” 2009). Comments like this are fairly
common on the talk page throughout the study period. At one point, an editor takes it upon
his/herself to reproduce the general sanctions language for anyone not sufficiently warned by the
tag (“Talk:Gaza War/Archive 24 - Wikipedia, the free encyclopedia,” 2009). As in the case of
Tariqabjotu and RomaC, editors would often refer to the WP:ARPBIA decision when engaged in debate with other editors, either as a warning of the potential consequences of abusive actions, or as a way of suggesting that solutions that had worked on less contentious articles might not be appropriate here.

Despite the common reference to WP:ARPBIA in discussions between editors, actual administrator enforcement of the arbitration seems to have been somewhat sparse during the studied period of the Gaza war article. The WP:ARBPIA decision holds that all editors warned or sanctioned under the arbitration should be logged. A review of this log shows that three of the most active editors involved with the Gaza war article were warned of the sanctions during the study period (“Wikipedia:Requests for arbitration/Palestine-Israel articles - Wikipedia, the free encyclopedia,” n.d.). Only two editors involved with the Gaza war article were the subject of sanctions under WP:ARBPIA during the study period. One, user Tundrabuggy, was banned from editing the topic area of a period of nearly 3 months. During this period, he/she ceased all editing activity on Wikipedia, returning to contributing only after the ban had expired. The other, user Nishidani, was banned for only a week, and remained active in other areas of Wikipedia during his/her ban. After the ban expired, Nishidani did not immediately return to editing the Gaza war article, choosing to work on other material until after the end of the study period. In preventing these editors from contributing to the Gaza war article, WP:ARBIA policed the boundaries of the editing community for this article with more precision than semi-protection could. Furthermore, these sanctions impressed the sensitive nature of the article even on editors who were not singled out for punishment by administrators.
Negotiated Neutrality: Key Negotiations Among Members of the Editing Community that Shaped the Gaza War Article

These were, then, a few important interventions by administrators and other authority figures in the evolution of the Gaza war article. These interventions had important effects, this much is clear. Most importantly, they served to police the boundaries of the editing community, deciding who was and was not eligible to participate in the creation of the Gaza war article. However, what is also clear is that the great bulk of conversation, debate, and activity surrounding the article took place between and among members of the editing community, with little or no administrative intervention. In this section of the chapter, I will explore how these interactions unfolded, and what this might tell us about the contours of Wikipedia's collective action, and especially about the shared values participants in Wikipedia expect to be upheld.

A key shared value of the Wikipedia editing community at large, and one we have already seen referenced in the course of Gaza war article, is the concept of "Neutrality." Claims to neutrality, or alternately, critiques of others' actions as "not neutral," were among the most common claims made by editors as they debated the Gaza war article. To give just one example, in one of many debates about the correct title for the article, which I deal with in detail later in this chapter, an editor opposed to the suggested title "2008-2009 Israeli Offensive in Gaza" writes that this title is, "Non neutral, very one sided. Israel is not assaulting Gaza or its people, but in a military operation against terror attacks from Gaza, against Hamas organization and all the terrorizing factions, as a defensive maneuver of a democratic state against an military organization"("Talk:Gaza War/Archive 12 - Wikipedia, the free encyclopedia,” 2009). Another editor, opposing the proposed title "Operation Cast Lead," (the Israeli Military's name for their
operations) writes, "POV. Operation Cast Lead is a term used by one side of the conflict which is Israel, The other side which is Hamas, Palestinian administration (PNA) and the Arab world calls it "Israel aggression" both are POV and thus not neutral terms. The best term is conflict"("Talk:Gaza War/Archive 12 - Wikipedia, the free encyclopedia," 2009). Both of these titles, it should be pointed out here, were ultimately rejected, demonstrating the importance of the claim to "neutrality" to Wikipedia editors.

However, as Joe Reagle points out, the concept of "neutrality," is complicated. Reagle writes that the way the NPOV defines "neutrality,"

[...] is difficult because it seems impossible to explain without recourse to an equally problematic constellation of concepts. If neutral means unbiased, and unbiased means fair, might fair mean impartial, or something else? Another source of confusion is the subject of the alleged neutrality: the platform, processes and policies, people, practices, or the resulting articles? Can bias in one contaminate the neutrality of another?"(Reagle, 2007).

To say that Wikipedia attempts to be "neutral," then, means that Wikipedia editors must engage with these thorny and difficult issues of meaning. Ultimately, Reagle writes that Wikipedians resolve this problem of defining "neutral" by treating neutrality not, "so much as an end result, but as a process"(Reagle, 2007). Because neutrality is an ongoing process, it is resolved on a case-by-case basis, and when editors make claims to "neutrality" in debates amongst themselves, it often falls to these same editors to decide what "neutrality" means in a given circumstance. By engaging in this "process" of neutrality, editors make important decisions about what content should remain on Wikipedia, what should be deleted, how content should be organized and what
language should be used to describe it.

**WP: V as Mechanism for Resolving the Difficulties of Neutrality**

Two other Wikipedia policies, called Verifiability (Wikipedia shorthand WP:V) and No Original Research (WP:OR), play an important role in the process of neutrality as practiced on Wikipedia. Verifiability holds that, "the threshold for inclusion in Wikipedia is verifiability, not truth—what counts is whether readers can verify that material added to Wikipedia has already been published by a reliable source [...], not whether editors think it is true" ("Wikipedia:Verifiability - Wikipedia, the free encyclopedia," n.d.). No Original Research prohibits editors from including, "unpublished facts, arguments, speculation, and ideas; and any unpublished analysis or synthesis of published material that serves to advance a position" ("Wikipedia:No original research - Wikipedia, the free encyclopedia," n.d.). Taken together, the NPOV, WP:V and WP:OR constitute the three "three core content policies" of Wikipedia ("Wikipedia:Neutral point of view - Wikipedia, the free encyclopedia," n.d.). Like the NPOV, WP:V and WP:OR were often referenced by Wikipedia editors engaged in debates over the Gaza war article, sometimes by directly quoting the language above. The deployment of WP:V and WP:OR in the debates surrounding the Gaza war article demonstrates how these policies, by allowing the inclusion of all "reliably sourced" material, and prohibiting material not based on these sources, helps Wikipedians to avoid making fraught decisions about "real world" moral issues. Instead, editors are able to rely on a relatively simpler and more resolvable process of making decisions about existing accounts in secondary sources.

The incredibly fraught debate over the listing of "civilian" casualties in the Gaza war article shows how WP:V allows editors to reach compromises as to Wikipedia content, even
when confronted with seemingly irreconcilable differences of opinion amongst editors. In the case of the Gaza war article, the problem of defining who was and was not a "civilian" casualty of the conflict was just such a seemingly irreconcilable case. Since listing casualty numbers was seen by many (but not all) editors as an important task for the article, it did not take long for editors to be drawn in to debating what numbers should be used to describe civilian casualties of the conflict. In a post to the article's talk page dated December 29, 2008, one editor challenges the way that civilian casualties of the conflict are being counted at that point:

It seems to me like somebody is trying to put a spin on things by stating that there are "29+ civilians" dead among the 287 on the basis of an ABC article stating that among those dead, at least 20 were children and 9 were women. That is quite biased, and should be changed ASAP, as while it is not technically incorrect, it is very misleading.

Also, it needs to be reflected in the article that quite a few of those killed were working in the Hamas government as civilians, carrying out normal jobs that involved no militant action because Hamas is essentially the government of Gaza. These people are no different to any public employees in any other country, especially considering the massive unemployment in the Gaza Strip ("Talk:Gaza War/Archive 1 - Wikipedia, the free encyclopedia," 2009).

We can see in this quote two related, effectively impossible to resolve, questions that editors would return to again and again on the talk page for the Gaza war article. First there is what might be called a question of methodology, that is to say, how should civilians be counted? Can civilian casualty counts be inferred by counting some other demographic category, such as
women or children, or is some other method of tracking the civilian dead needed? Second, and perhaps more difficult, is what could be called a question of ontology. Given the complicated political status of Gaza, a jurisdiction not quite a state with a government lead by a party that is also considered a terrorist organization by Western governments whose military consists largely of irregular fighters intermixed (by both necessity and design) with civilian populations, the question of where the line between civilian and combatant should be drawn in this conflict is one Wikipedia editors find themselves unable to resolve. Just hours after the above was posted to the talk page another editor, Wikifan12345 (whose conduct would eventually earn him a "topic ban" under the Israel-Palestine Arbitration) would respond, objecting that "you can't compare Western government to a recognized Terrorism-supporting government," and thus counting Hamas civil servants as "civilians" would be incorrect.

Two arguments made by editors early in the article demonstrate just how difficult it would be for Wikipedia editors to attempt to reconcile definitions of "civilian" based on "real world" ethical and legal considerations. Wikifan12345, for his part, argues that Hamas's decentralized nature blurs the line between civilian and military casualties. He writes that, "Hamas runs like a terrorist organization, in the sense that support comes from many locales, homes, libraries, things that we consider ordinary is often used there to conceal weapons/soldiers/etc," ("Talk:Gaza War/Archive 4 - Wikipedia, the free encyclopedia," 2009) and thus he feels the counts of "civilians" being made by NGOs and Palestinian sources have been unfairly inflated. In contrast, the appropriately named editor Nonzionist argues:

Almost ALL Palestinians are civilians. If my home is invaded and I attempt to defend my family, do I lose my civilian status? International law recognizes the
right of people under occupation to RESIST, and victims of aggression have a right of self-defense ("Talk:Gaza War/Archive 4 - Wikipedia, the free encyclopedia," 2009).

Both Wikifan and Nonzionist would return to these lines of reasoning in later arguments about the definition of "civilian casualties."

Other editors quickly point out that these arguments are irrelevant in the face of WP:V and WP:OR and yet heated debate over them grows to involve several other editors and many more threads of conversation. Despite repeated pleas, neither Wikifan12345 nor Nonzionist has very much luck in swaying their fellow editors to define "civilians" in the way that they see best, though many editors express some sympathy for one argument or another. In one particularly telling moment, editor Nableezy, one of the most active editors on the Gaza war article and one who generally seemed sympathetic to the Palestinian cause, tells NonZionist:

NonZionist, I completely agree with you, but for the purposes of this article, unless we can find a reliable source, and probably people would want multiple sources, that make this point, there is not really any way of doing this. But as a philosophical discussion, I do agree that in an occupying force killing somebody, regardless of the situation, would best be described as killing a victim of occupation ("Talk:Gaza War/Archive 15 - Wikipedia, the free encyclopedia," 2009).

Here we can see how Nableezy articulates a separate moral space for the Wikipedia community, distinct from one's moral sense of real world conflict. His or her own moral values say "an occupying force killing somebody, regardless of the the situation, would best be described as
killing a victim of occupation," but Nableezy stresses the need for information included on Wikipedia to meet the shared values of the community, especially the value placed on reliable sources, noting that "probably people would want multiple sources," for a controversial claim.

Unlike Nableezy’s articulation of shared values, NonZionist and Wikifan12345 continue to advocate on behalf of their own values, to little avail. Both eventually stop trying to influence the course of this article. Wikifan12345 is temporarily banned from editing articles relating to the Israeli-Palestinian conflict because of bad behavior associated with a different article. During the period of this ban, his editing activity diminished considerably. However, the ban expired at the beginning of the 2010 and since then he has resumed heavy editing, though he has not yet returned to the Gaza war article. NonZionist, for his part, makes a final contribution to the discussion of the Gaza war article on February 1, 2009 and has been dormant ever since. The cases of both of these editors speak to the apparent difficulty of being an advocate for a particular set of moral values on Wikipedia, without taking into consideration the shared values of the Wikipedia community itself. The cases of both of these editors speak to the apparent difficulty of being an advocate for a particular set of moral values on Wikipedia, without taking into consideration the shared values of the Wikipedia community itself. Unlike the space of peer production imagined by Benkler and others, in which cyborg individuals are able to call on individually owned technological resources to pursue their desires without outside restraint, the real space of Wikipedia regulates and modulates how members of the editing community pursue their desires.

In contrast to Wikifan12345 and NonZionist, whose respective desires to express their particular moral points of view were frustrated by Wikipedia's policies and practices, editors
engaging in the "process of neutrality" described by the NPOV, WP:V and WP:OR are able to find an acceptable solution for representing the casualty count for the Gaza war. As early as January 12, 2009 the article infobox began listing casualty counts based on both Israeli Defense Force (IDF) and Palestinian Ministry of Health (MoH) figures ("Gaza War - Wikipedia, the free encyclopedia," 2009a). Later the figures drawn from the MoH would be replaced, in part, by figures from the Palestinian Centre for Human Rights (PCHR), an NGO active in the West Bank and Gaza. Over the period from January 12 to January 24 the casualties section of the infobox would be in flux, with various configurations of sources and wording being tried out. By January 23, the casualty listing in the infobox drew on a variety of sources in a somewhat idiosyncratic way. The total number of Palestinian dead is, in this revision, cited only to an Australian newspaper, with no indication of the paper's source. Two figures are given for Palestinian "militants and policemen" dead\(^{15}\), one cited to the PCHR and one to the IDF. A single figure each is provided for both Palestinian civilian dead and wounded, and these figures are cited to the PCHR and MoH, respectively. These sources are noted in parenthesis immediately after the associated figures("Gaza War - Wikipedia, the free encyclopedia," 2009b). In the evening of January 23, editor AgadaUrbanit objects to the use of the PCHR civilian casualty number, writing that he believes the PCHR numbers to be flawed since, "the civilians [counted] not only included innocent bystanders, but also Hamas members killed in non-combat situations, such as Said Siam and Nizar Rayan." AgadaUrbanit cites a CBS news source for this allegation, and strives to have the PCHR numbers stricken, but other editors argue that these numbers have been widely reported in other sources and are thus notable. Finally he/she concedes, "OK I see what

\(^{15}\) there was considerable debate over the uncertain civilian status of police in the Gaza strip
you say [sic]. Maybe we could add IDF numbers for civilians in InfoBox. Does it sound [sic] fair
and balanced?” AgadaUrbanit then proceeds to edit the article to add an IDF figure for
Palestinian casualties. He/she would continue pressing for language to be added to the article
"warning" readers of possibility that the PCHR civilian casualty figure included an, "unknown
number of Hamas military commanders killed in 'non-combat situations'" (“Talk:Gaza
War/Archive 26 - Wikipedia, the free encyclopedia,” 2009), but this addition was successfully
opposed on the grounds of its being original research.

The compromise of consistently citing both PCHR and IDF numbers for Palestinian
casualties that AgadaUrbanit helped to engineer, on the other hand, was successful. Indeed, it
would persist for almost the entire remainder of the study period, being removed for only a few
short periods before being replaced. By the end of January 2009, both Palestinian and Israeli
sources were being cited for the total number of Palestinian dead (“Gaza War - Wikipedia, the
free encyclopedia,” 2009c). As of this writing (June 2010) the Gaza war article continues to list
both PCHR and IDF figures for Palestinian casualties in the article infobox16 (“Gaza War -
Wikipedia, the free encyclopedia,” 2010). This compromise solution, listing casualty claims
made by two separate and opposing sources, has persisted even in the face of intense debate, and
opposition from multiple sides. In one example from late January, AgadaUrbanit continued to
call for the removal of the PCHR number (“Talk:Gaza War/Archive 29 - Wikipedia, the free
encyclopedia,” 2009). In another incident, only a few days later, Cerejota writes "I am concerned
by the use of IDF figures [in the casualty count]. How does the IDF know this? They are neither
on the ground, nor the government of Gaza, nor do they have any access to hospital information"

16 Editors do not dispute the Israeli claim that 13 of its citizens, 10 military personnel and 3 civilians, died
in the conflict
The ability of editors with sympathies on both sides of the Gaza war to reach a consensus on the basis of WP:V allowed for a plurality of voices to be heard, so long as these voices were backed by reliable sources. The possible consequences of this method for allowing the inclusion of multiple voices are explored in the next section.

**Reliable Sources as Contested Terrain**

By citing multiple reliable sources to include more than a single point of view, editors involved in the casualty count debate succeeded in building a lasting compromise on the issue, even if the compromise left all parties somewhat unsatisfied. They did so by side-stepping difficult questions about objective truth, such as those raised by AgadaUrbanit about the PCHR's casualty-counting methodology and those raised by Cerejota about the IDF's ability to track casualties "on the ground," and instead focused on the relatively straightforward matter of what sources were reporting, which could be verified by any editor. This deferral of the difficult questions of truth onto sources, while clearly a useful way for Wikipedia editors to build effective compromises on controversial matters, also raises difficult questions of its own. Namely, the question of what does, and does not, constitute a "reliable" source.

In fact, the question of what sources are "reliable," was one of the first raised by editors working on the Gaza war article. In a post to the article's talk page dated to the evening of December 27, 2008, editor Plunialimoni objects that, "'Debka' is not a reliable source... linking to Reuters instead" (“Talk:Gaza War/Archive 1 - Wikipedia, the free encyclopedia,” 2009). "Debka" here refers to the Israeli news website DEBKAfile, of which another editor writes, "In my personal opinion, Debka is usually flogging a right-wing agenda and I do not consider them a
serious news source" ("Talk:Gaza War/Archive 1 - Wikipedia, the free encyclopedia," 2009). As
the initial quote indicates, the citation to Debka was removed, and the relevant facts (an early
estimate of conflict casualties) were altered to reflect information drawn from a source seen as
more trustworthy. Early on December 28, another source is challenged by an anonymous editor,
who writes that using the Palestinian News Network (PNN) as a source is unacceptable since, in
the editor's opinion, PNN "is far from unbiased. It is pro-palestinian, pro-Hamas website and it is
against any sort of peaceful solution" ("Talk:Gaza War/Archive 1 - Wikipedia, the free
encyclopedia," 2009). Editor Boud, whose editing record as a whole seems to portray someone
sympathetic to Palestine, writes to defend PNN, stating "Probably most news media sources from
country X used in any wikipedia article are pro-country-X and pro-government-of-country-X, so
that's not any higher degree of bias than is typical of CNN, NYT, BBC, etc." Editor
Wikifan12345, who establishes a record as a vocal pro-Israeli advocate over the course of the
creation of this article, objects to Boud's defense of PNN, writing, "Yes PNN doesn't even meet
blog standards. deleted." Despite continued defense of the source from Boud and others, the
PNN references are all removed by January 15, 2009, when a large block of text discussing the
lead up to the war, including the PNN cited Egyptian claim that they had no prior warning, was
removed.

These early debates over the reliability of sources would not be the last conflicts that
would erupt over this issue during the creation of the Gaza war article. Editors challenged the
sources cited by others on a regular basis. In addition to the debate over the PCHR and IDF
sources used for casualty count numbers discussed in the previous section, heated discussion
took place over the use of such sources as a statement by the official spokesperson of the
Palestinian Popular Resistance Committees ("Talk:Gaza War/Archive 1 - Wikipedia, the free encyclopedia," 2009), the American Center for Law and Justice ("Talk:Gaza War/Archive 6 - Wikipedia, the free encyclopedia," 2009), the Pakistani newspaper website Dawn.com ("Talk:Gaza War/Archive 3 - Wikipedia, the free encyclopedia," 2009), and the activist website antiwar.com ("Talk:Gaza War/Archive 16 - Wikipedia, the free encyclopedia," 2009).

Over the course of these exchanges a pattern emerges. Both Palestinian and Israeli advocates argue against sources from the opposite side that they feel are too extreme to be reliable. For example, wikifan12345 objects to complaints that the article cites too many western sources by arguing, "Arab and Palestinian media is a sham at best, and I'm being generous here" ("Talk:Gaza War/Archive 4 - Wikipedia, the free encyclopedia," 2009). In another instance, an editor objects to the fact that, as he or she sees it, a section on "Palestinian Militant Activity," is slanted since, "almost every piece of information here can be traced back to IDF sources," and argues that, "we need to use more neutral sources" ("Talk:Gaza War/Archive 29 - Wikipedia, the free encyclopedia," 2009). A third group of editors, most notably editor Cerejota, positions themselves as being between the two sides, and advocates for pluralism and inclusiveness in Wikipedia sourcing. In a long post to the talk page early in the article's development, Cerejota gives an in-depth explanation of his understanding of the NPOV and WP:V policies. He centers his discussion on the notion that Wikipedia's goal must be, "verifiability, not truth." He explains that, "the key point is that we are not seeking the truth as seen by any of us, but that the information is a verified fact or opinion" ("Talk:Gaza War/Archive 1 - Wikipedia, the free encyclopedia," 2009). These facts and opinions can, Cerejota writes, be sourced from a variety of places. He stresses that sources themselves need not be "neutral," rather Wikipedia's neutrality is
an effect of drawing from a plurality of sources. He writes:

A reliable source can be partisan and non-neutral. What measures the quality of a reliable source is the amount of verifiability other reliable sources give to that source. The more controversy around a topic, the more need for verifiability. Hence, there needs to be more sources and more variety of POV in sources ("Talk:Gaza War/Archive 1 - Wikipedia, the free encyclopedia," 2009).

Given these three positions, what is the actual outcome of the contest over "reliable sources" for the Gaza war article? Because the lines of conflict here are closely tied to national identity, as well as to the larger conflicts involving the supra-national formation of "the western world," investigating what countries are represented by sources cited in the Gaza war article might help to establish how relative success of the pro-Israel, pro-Palestine, and pro-plurality factions in shaping the selection of sources for the article. A full listing of the sources cited by the Gaza war article at the close of the study period can be found in table one. Figure one displays the countries of origin of these sources in graphic form. As the graph shows quite clearly, the overwhelming majority of the sources for this article were attributable to Israel, the US and the UK. Sources from occupied Palestine itself were very rare.
Table 1

Sources Cited in the Gaza War Article
By Number of Citations

Jerusalem Post
Ha’aretz
BBC News
Ynet News
Reuters
UN Office for the Coordination of
Humanitarian Affairs - Occupied
Palestinian Territory
NY Times
The Guardian
Sunday Times Online
(timesonline.co.uk)
Human Rights Watch
Al Jazeera English
AP
CNN
Terrorism-info.org.il
The Telegraph
The Independent
Xinhua
VOA News
Center for Strategic and International
Studies
Israeli Ministry of Foreign Affairs
Website
Yahoo News
Ma’an news
Palestinian Center for Human Rights
Al Jazeera Arabic
International Herald Tribune
AFP
MSNBC
Amnesty International
Fox News
Washington Post
Radio Mundial (Venezuela)
Al Arabiya
JCPA
International Institute for Counter-terrorism (Israeli)
Huffington Post
CBS
Der Spiegel
Dover.il (Israeli Defense Forces Site)
Defense News.com
B'Tselem
UN News Centre
Israeli Embassy Webpage
Vanity Fair
Gulf News
nana10.co.il
UN Press Conference on Gaza
Humanitarian situation
Syndey Morning Herald
IDF Spokesperson website
USA Today
NPR
Toronto Globe and Mail
Intel. & Terrorism Info. Center at Israel
Intelligence Heritage & Commemoration Center
Union of Health Work Committees, Gaza
China Daily
Committee to Protect Journalists
Belfast Telegraph
UN Office of the Secretary General
Lone Star Times
News 24 (S. Africa)
NGO monitor
Daily Mail
Washington Times
National Post
The Sunday Times (Western Australia)
Middle East Times
Global Security.org
Izz ad-Din al-Qassam Brigades
Information Office
azcentral.com
Washington Institute for Near-East Policy
McClatchy News Service
Israel National News
Kyiv Post
BBC Arabic
Khaleej Times
International Red Cross
Javno (Brussels)
Jurist (U Pittsburgh Law)
LA Times
ABC News
Radio Netherlands
World Health Organization
Dar al hayat
Arab News Network
PUKMedia (Kurdish)
The Nation
UN Institute for Training and Research
Christian Science Monitor
Jamaica Information Service
UN General Assembly
United Nations Regional Information Centre
Islamic Republic News Agency
NormanFinklestein.com
Jewish Telegraphic Agency
UN Human Rights Council
The Observer

By Nation of Origin:
Israel

Jerusalem Post
Ha'aretz
Ynet News
Terrorism-info.org.il
Israeli Ministry of Foreign Affairs
Website
JCPA
International Institute for Counter-terrorism (Israeli)
Dover.il (Israeli Defense Forces Site)
B’Tselem
Israeli Embassy Webpage
nana10.co.il
IDF Spokesperson website
Intel. & Terrorism Info. Center at Israel Intelligence Heritage & Commemoration Center
NGO monitor
Israel National News
Jewish Telegraphic Agency

UK

BBC News
The Guardian
Sunday Times Online
timesonline.co.uk
Reuters
The Telegraph
The Independent
Amnesty International
Belfast Telegraph
Daily Mail
BBC Arabic
The Observer

USA

Huffington Post
CBS
NY Times
Human Rights Watch
AP
CNN
VOA News
Center for Strategic and International Studies
Yahoo News
MSNBC
Defense News.com
Fox News
Washington Post
Vanity Fair
USA Today
NPR
Committee to Protect Journalists
Lone Star Times
Washington Times
Middle East Times
Global Security.org
azcentral.com
Washington Institute for Near-East Policy
McClatchy News Service
Jurist (U Pittsburgh Law)
LA Times
ABC News
The Nation
Christian Science Monitor

UN
UN Office for the Coordination of Humanitarian Affairs - Occupied Palestinian Territory
UN News Centre
UN Press Conference on Gaza
Humanitarian situation
UN Office of the Secretary General
World Health Organization
UN Institute for Training and Research
UN General Assembly
United Nations Regional Information Centre
UN Human Rights Council

Qatar
Al Jazeera English
Al Jazeera Arabic

China
Palestinian Territory

Ma’an news
Palestinian Center for Human Rights
Union of Health Work Committees, Gaza
Izz ad-Din al-Qassam Brigades
Information Office

France

International Herald Tribune
AFP

Venezuela

Radio Mundial (Venezuela)

UAE

Al Arabiya
Gulf News
Khaleej Times

Germany

Der Spiegel

Australia

Syndey Morning Herald
The Sunday Times (Western Australia)

Canada

Toronto Globe and Mail
National Post

S. Africa

News 24 (S. Africa)
<table>
<thead>
<tr>
<th>Country</th>
<th>Media Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ukraine</td>
<td>Kyiv Post</td>
</tr>
<tr>
<td>Switzerland</td>
<td>International Red Cross</td>
</tr>
<tr>
<td>Belgium</td>
<td>Javno (Brussels)</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Radio Netherlands</td>
</tr>
<tr>
<td>Lebanon</td>
<td>Dar al hayat</td>
</tr>
<tr>
<td>Jamaica</td>
<td>Jamaica Information Service</td>
</tr>
<tr>
<td>Iran</td>
<td>Islamic Republic News Agency</td>
</tr>
<tr>
<td>Other/Could not be Determined</td>
<td>Arab News Network</td>
</tr>
<tr>
<td></td>
<td>PUKMedia (Kurdish)</td>
</tr>
<tr>
<td></td>
<td>NormanFinklestein.com</td>
</tr>
</tbody>
</table>
There are several factors which may account for this disparity between "western" and "non-western" sources in the composition of this article. The first is that the English Wikipedia's verifiability policy favors sources in English, as this renders them easier for the majority of English Wikipedia editors to check up on. The second is advantage Western sources enjoy in material conditions, internet access, and distribution, which was noted by Wikipedia editors themselves during their discussion of sources on several occasions. Finally, in the face of consistent and often very hostile opposition to non-western sources as demonstrated by the actions of Wikifan12345 and others, described above, editors may have chosen to cite Western sources for facts they wished to include, rather than go through the trouble of making the case for
inclusion of non-Western media. It should be noted that, as Appendix one demonstrates, the "western" sources the article draws off of are hardly monolithic, and in many cases even editors espousing an anti-western point of view may have been able to find "western" sources they could cite to support their preferred narrative. In one case that demonstrates several of these influences at play, the inclusion of the claim that the War was referred to as the "Gaza Massacre" went from being cited to several Arabic sources to a single English-language source.

In any event, this lopsided inclusion of Western sources undermines the expansive, pluralist position advocated by Cerejota for Wikipedia sources. It suggests strongly that, in this way at least, Wikipedia's content policies, policies shaped by Wikipedia's need to manage and conserve collective labor, make the site somewhat inherently conservative, bound to reflect historical inequalities of access and media power as it defers difficult questions of "truth" to its sources. However, the "neutrality process" that allows Wikipedia to make this deferral does not always function. In some cases, this process of "verifiability not truth" breaks down, forcing Wikipedia to make decisions about content without being able to reach the compromise of including multiple versions of the facts attributed to multiple reliable sources.

A Scarce Symbol: The article title as breakdown of the neutrality process

One example of a debate where the process of neutrality dictated by "verifiability not truth" broke down was the heated discussion over the article's title. This debate began soon after the article was created. The fledgling article was moved from its initial title, “Operation Cast Lead” (the official name given to the Israeli military operations by the IDF) to the title “2008 Gaza City Bombings,” a mere four and a half hours after its creation. The editor responsible for this move commented that they felt this title was “clearer” and “easier to recognize.” Just a few
minutes later, an editor moved the article again, to the title “2008 Gaza Strip Bombings,” noting that the attacks were not limited to Gaza City. It took less than ten minutes for a third editor to make a slight change to this title, moving the page to “2008 Gaza Strip bombings,” noting that they were making this change to better conform to the Wikipedia Manual of Style's guidelines for article titles. Indeed these guidelines do recommend that editors, “use lower case, except for proper names” (“Wikipedia:Article titles - Wikipedia, the free encyclopedia,” n.d.). However, cases such as this one, where policy provided clear-cut guidance that editors could mechanically follow, would prove to be the exception rather than the rule. Instead, the article title debates would prove to be a site of heated negotiations where site policies, as well as the reliable sources based neutrality process provided by the NPOV and WP:V, were often not able to resolve disputes.

Indeed, the title "2008 Gaza Strip bombings" would be wiped away in short order by a series of more contentious moves. A little before 1AM UTC on December 28, 2008, roughly eight hours after the article's creation and three hours after the previous move, editor RyanGerbil10 moved the article back to the original “Operation Cast Lead.” By this point, the contention over the article's title had started to attract attention on the associated talk page. Several editors argued that the title “2008 Gaza Strip bombings” wasn't specific enough, or informative enough, to conform to the requirements of the Manual of Style. Others argued that there was a precedent of naming articles about military actions after their official codenames, and pointed to the article on Germany's 1941 invasion of the Soviet Union, which Wikipedia lists under its famous codename “Operation Barbarossa,” as an example of this precedent (“Talk:Gaza War - Wikipedia, the free encyclopedia,” 2008c).
For their part, those opposed to using “Operation Cast Lead” as the article title raised an important objection. Naming an article about a military conflict using the operation name assigned to it by one side of this conflict was not, they argued, neutral. One editor wrote that, “It seems actually unfair to have an article about a military act with that many civilian casualties named after a poem,” (“Talk:Gaza War - Wikipedia, the free encyclopedia,” 2008c) referring to the fact that “Operation Cast Lead” drew its name from a line of a Hanukkah song that discusses a “dreidel cast in lead.” They went on to argue against the use of the Israeli military operation name as an article title since, “it is only called that way by the IDF and the rest of the world calls it gaza bombings or something” (“Talk:Gaza War - Wikipedia, the free encyclopedia,” 2008c).

Editor Cerejota, also expressed his belief that “Operation Cast Lead” was not a neutral title in a post to the talk page on around 2:00AM UTC December 28, 2008, (“Talk:Gaza War - Wikipedia, the free encyclopedia,” 2008c), and promptly moved the article to the title “December 2008 Gaza Strip bombing.” As his comment on the move he wrote: “WP:SNOWBALL title must be neutral,” again invoking the need for neutrality, as well as what is known as Wikipedia's “snowball clause,” which holds that, “If an issue doesn't have a snowball's chance in hell of getting a desired outcome, don't keep pushing for it anyway” (“Talk:Gaza War - Wikipedia, the free encyclopedia,” 2008c). By referencing the snowball clause, Cerejota expressed his belief that the non-neutrality of using “Operation Cast Lead” as an article title was patently obvious.

Cerejota would quickly move the page once more, this time to the title “December 2008 Gaza Strip airstrikes.” Shortly after this move administrator Aervanath set the protection settings on the article such that no one with less than Sysop status on Wikipedia could move the article.

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17 Cerejota self-identifies as male over the course of the archived discussions
This prevented any further back-and-forth movement of the article between different titles, and thus precipitated a long and contentious formal debate process on the article’s talk page, in which various factions presented their case for the best article title, with the goal of convincing an administrator that consensus demanded a move to a new title.

To understand the debate that arose over the title of the Gaza war article, we must first understand the larger context of naming procedures and debates on Wikipedia. The Gaza war article is hardly the only Wikipedia article to have debate erupt over the the title given to the article. Indeed, such debates appear to be quite common. Several such debates are recorded on a Wikipedia project page maintained for the purpose of documenting, “Wikipedia's Lamest Edit Wars.” This tongue-in-cheek page, clearly marked with a tag warning readers “This page contains material which is kept because it is considered humorous,” (“Wikipedia:Lamest edit wars - Wikipedia, the free encyclopedia,” n.d.) nonetheless provides several interesting examples of cases where Wikipedia editors have found it difficult to reach agreement about what title should be granted to a given article. These include: the article on the monster from the movie Cloverfield, which was never named in the movie itself and named in various ways in supporting materials; the article on the planet Pluto, which lost its planet status in the summer of 2006 and, despite the protests of Pluto advocates, had its article moved to reflect its new astronomical designation “134340 Pluto;” the article on, as the lamest edit wars page puts it “Fossil fuel for reciprocating piston engines equipped with spark plugs,” which speakers of American English want to list under the title “Gasoline (petrol)” and speakers of British English want to list under the title “Petrol(gasoline);” and the politically laden debate over the proper title to the article on the Sea of Japan, which some would like to see re-titled to acknowledge the Korean-favored
name of “East Sea,” and where debate has broken out over the proper title of the dispute page
documenting the debate over the name itself, with some editors insisting that this page be called, “the Dispute between the body of water between Japan and Korea.” (“Wikipedia:Lamest edit
wars - Wikipedia, the free encyclopedia,” n.d.) The inclusion of these name debates on a page
devoted to “lame” edit wars suggests that at least some Wikipedia editors find these debates over
names to be ridiculous, yet the regularity with which they erupt and, as we will see in the case of
the Gaza war article, the ferocity with which they may be fought shows that many Wikipedia
editors take these debates very seriously. What is it that drives editors to engage in these
disputes, even in the face of ridicule by their fellow Wikipedians?

The architecture of the Mediawiki platform on which Wikipedia runs provides part of the
answer to this question of motivation. As the page listing style guidelines for article names points
out, each article must have a “unique title,” due to “unavoidable technical restrictions” of the
Mediawiki software. (“Wikipedia:Article titles - Wikipedia, the free encyclopedia,” n.d.) The
Mediawiki software uses the unique title assigned to an article to store and retrieve the article, to
allow users to link to the article, and to find it in Wikipedia's built-in search function. Thus, the
important technical role played by article titles may help to explain why Wikipedia editors
consider titles important enough to engage in lengthy and heated debate over.

However, other technical features of the Mediawiki software suggest that technical
functions alone cannot explain the importance Wikipedia editors attach to article titles.
Mediawiki allows for articles to be assigned, in effect, multiple names by using special pages
known as “redirects.” A redirect page, “is not an article, but within the Main namespace it sends

Wikipedia is divided into several Namespaces which allow for the separation of Encyclopedia content
from policy pages, user pages, and other procedural content.
the reader to an article, usually from an alternative title” (“Wikipedia:Redirect - Wikipedia, the free encyclopedia,” n.d.). Redirects thus enable Wikipedia to practice a curious semiotics, in which multiple symbols (names) may be mapped to the same meaning (article). The Gaza war article, for example, is the target of dozens of different redirect pages, each of which associates a different term with the content in this article. These terms include all of the prospective article titles discussed thus far, as well as the controversial term “Gaza Massacre,” which was itself the subject of considerable debate among editors (“Pages that link to "Gaza War" - Wikipedia, the free encyclopedia,” n.d.) 19. Thus, even though these alternate titles did not, ultimately, win consensus as the best term to associate with this content Wikipedia users can still search for, and Wikipedia editors can still link to, these terms and arrive at the content in the article. A connection is thereby preserved between these alternate titles and the article content.

Nonetheless, the “official” article title retains pride of place. No matter what link or search term brings a reader to an article, the article title appears at the head of the page, with a small note telling the reader they were redirected from another term immediately below. More importantly, the article title serves as a boundary for acceptable article content. The Wikipedia Manual of Style states that, “titles should match the article contents” (“Wikipedia:Manual of Style - Wikipedia, the free encyclopedia,” n.d.) and while this wording suggests that titles should be crafted to match article contents, some examples from the debates surrounding the Gaza war article suggest editors may also apply this principle in reverse, mobilizing the article’s given title as a reason why the article should or should not include a particular piece of information. One

19 In addition, special pages known as disambiguation pages permit multiply determined terms to map to several articles. For example, the disambiguation page for “shoe” lists, among many alternative meanings, horseshoes, brake shoes, the card game shoe, and the comic strip “Shoe.” The effects of these disambiguation pages on meaning making on Wikipedia, while interesting, are beyond the scope of this chapter.
editor, writing during the period when the article was entitled “Gaza Strip airstrikes,” argued that, “three other sections including 1,075 words on ”Background,” with disputed and messy content,” should be “cut to a single paragraph” since “this is an article about an airstrikes on Gaza [sic].” (“Talk:Gaza War/Archive 2 - Wikipedia, the free encyclopedia,” 2009) In another case, an editor objected to the inclusion in the article (at this point entitled “2008–2009 Israel–Gaza Conflict”) of an image depicting demonstrators showing their support for captured Israeli soldier Gilad Shalit, writing, “the image should not be included in the section on violations of international law within this article, because only violations related to the 2008-2009 Israel-Gaza conflict belong there” (“Talk:Gaza War/Archive 14 - Wikipedia, the free encyclopedia,” 2009) Thus, the article title retains a privileged, singular status as the symbol that defines and bounds a Wikipedia article, despite the presence of redirects. This singular status makes article titles a unique challenge for Wikipedia editors. Unlike the example of the case of the accounting of "civilian" casualties of the Israeli military action in Gaza explored earlier in this chapter, which was resolved when editors ultimately chose to include the counts of civilian casualties from several different authorities, including the IDF, Palestinian medical services, and the UN, in the case of the title, editors cannot simply include all "reliable" accounts, instead they must choose a single article title. This makes the title a particularly fraught ground for discussions of "neutrality."

The debate over the title of the Gaza war article can be divided into three rough periods. The first is the period prior to the decision, documented above, to apply move protection to the article. During this period, editors attempted to apply a variety of names to the article, resulting in repeated moves of the page. The decision to move protect the article was almost certainly
prompted by a desire to avoid this potentially disruptive behavior. Some editors objected to what they saw as a unilateral move by admins to "lock in" an article title they had not consented to. In a discussion soon after the page was moved to "2008 Gaza strip airstrikes" and move protection was applied, Wikifan12345 writes that the admin who locked in the name, "abused his powers," and, "needs to be penalized," because, in Wikifan12345's opinion, the title "Operation Cast Lead" enjoyed more editor support than the current title ("Talk:Gaza War/Archive 3 - Wikipedia, the free encyclopedia," 2009). In a later discussion, editor Tiamut opposes the admin action to move the article from "2008 Gaza airstrike" to "2008-2009 Israel-Gaza conflict," rather than Tiamut's preferred title of "Assault on Gaza," writing "I am disappointed to see that an admin has unilaterally decided that it is the best name for the page, while the discussion is still ongoing. "Israel-Gaza conflict" is barely used in the mainstream media, with less than 21 hits in google news. "Assault on Gaza" enjoys 1,500 hits by way of contrast" ("Talk:Gaza War/Archive 3 - Wikipedia, the free encyclopedia," 2009). The fact that admins decided to fully move protect the article, even in the face of arguments like this, which demonstrate that such protection risked alienating some editors, demonstrates the value admins placed on having a stable title. Clearly the ontological confusion that would have resulted from an ongoing "move war" was seen as a real danger for maintaining productive activity on the article.

Move protecting the Gaza war article forced editors who wanted to see the article title changed to attempt to establish consensus for the new title and demonstrate that consensus to admins. This resulted in a number of very long and contentious threads of debate being posted to the article's talk page ("Talk:Gaza War/Archive 11 - Wikipedia, the free encyclopedia," 2009; "Talk:Gaza War/Archive 12 - Wikipedia, the free encyclopedia," 2009; "Talk:Gaza War/Archive
During the period from January 2, when the article was moved to "2008-2009 Israel Gaza conflict," to May 6, when the title was set to "Gaza war," editors made a variety of arguments for and against various alternative titles. Proponents of using "Operation Cast Lead" as the article title argued that this terminology was precise, specific, and supported by a precedent of using operation names to title similar articles, such as an article on a February 2008 Israeli military excursion into the Gaza strip, which carries its Israeli operation name, "Operation Hot Winter"(“Operation Hot Winter - Wikipedia, the free encyclopedia,” n.d.). Opponents of this title argued that it was not neutral to use the name assigned by one side of a conflict as the title of the article on that conflict, and that the English language press was not widely using the term "Operation Cast Lead" to describe the events then unfolding in the Gaza strip (“Talk:Gaza War/Archive 12 - Wikipedia, the free encyclopedia,” 2009). Tiamut argued that the name "Assault on Gaza" was being used widely in the press based on a Google search on the term, and Cerejota challenged this assertion with a lengthy and figure-filled critique of Tiamut's Google search methodology. Other editors opposed the "Assault on Gaza" title because they felt that this title was "one sided" (“Talk:Gaza War/Archive 3 - Wikipedia, the free encyclopedia,” 2009). The ultimate title, Gaza war, was supported as simpler and clearer than the existing title, and opposed on the grounds that it could be confused with articles on earlier military actions in Gaza, and that it unfairly characterized the most recent hostilities as unconnected from earlier violence in the region (in particular, pro-Israeli editors wrote that the Gaza war title obscured what they saw as the provocation of the December 2008 airstrikes by Hamas) (“Talk:Gaza War/Archive 38 -
On April 29, Nableezy opened yet another discussion of the article's title, writing to propose that the article be moved from "2008-2009 Israel-Gaza Conflict" to "Gaza War" in the grounds that, "The major sources use Gaza War/Gaza war as the name of the conflict, for a sampling: AP [12] [13], Reuters [14], Washington Post [15] [16], Haaretz [17], BBC [18] [19], The Times [20], The Guardian [21] [22] [23], CNN [24] [25], Newsweek [26] [27], Time [28] [29]" ("Talk:Gaza War/Archive 47 - Wikipedia, the free encyclopedia," 2009). The bracketed numbers in Nableezy's text correspond to links provided demonstrating that each source was using the term "Gaza war." Unlike prior discussions on the topic, this one was able to establish consensus for a new title, with ten editors leaving comments in support of the change, and only one editor writing to oppose it. The change was supported both by editors whose activity suggested they were generally pro-Palestine, such as Tiamut and Nableezy, and others that tended to skew pro-Israel, such as AgadaUrbanit and Sceptic Ashdod. The record suggests several reasons why the discussion opened by Nableezy on April 29 was successful in changing the article's title whereas earlier discussions had not been. First, Nableezy was able to successfully synthesize multiple reliable sources in support of his or her position. This strategy, while distinct from the strategy observed in the debate over civilian casualty figures, still relies on sources to resolve questions of truth. Second, the editing community itself had changed over the course of the article's evolution. The volume of responses to the April 29 discussion of the article's title was much reduced from the earlier title debates. Some particularly stubborn partisans, such as editor Non-Zionist, had quit the article by this point. Finally, the Gaza war title was seen as an acceptable, if not ideal, compromise by a variety of editors, as is demonstrated by
editor Falestine fee Qalby's tepid support: "Fine Not a name that I prefer but I can live with it. It is a name that is commonly used in English RS" ("Talk:Gaza War/Archive 47 - Wikipedia, the free encyclopedia," 2009).

Ultimately, the debate over the title of the Gaza war article suggests several things about the contours of the collective activity of editing on Wikipedia. First, it shows how Wikipedia policies must be negotiated by editors, especially in situations where policies are difficult to enforce. Because of their singular nature, article titles make enforcing the NPOV and WP:V policies difficult, and thus subject to considerable negotiation. This negotiation of site policies means that the editing community participating in the decision making process matters. The fact that the Gaza war article, unlike other articles documenting Israeli military operations in the region, was ultimately prevented from Israeli operational code name as its title by the determined opposition of editors demonstrates this. So too does the shift towards consensus for the "Gaza war" title in the period after more polarizing editors had stopped participating. Additionally, the importance of the singular title of the article suggests that single, shared spaces for the production of content may indeed be very important, even when these singular spaces may lead to controversy and tension among editors with different points of view.

**Conclusion**

Taken as a whole, the example of the Gaza war article demonstrates several important things about Wikipedia. First, it shows how Wikipedians both value and contest singular spaces of production. This stands in contrast to the cyborg individual informed model of peer production presented by Benkler, and assumed by some early Wikipedians, in which individual producers used individually owned hardware to create many, small, separate spaces of cultural production.
This fragmentation of the space of media production was both hailed as a source of greater information diversity and individual freedom, and feared as a possible Balkanization of the public sphere. Wikipedia’s example suggests both of these reactions are unwarranted. Instead, what is needed is a better understanding of how users interact with one another in the shared spaces of peer production, how these spaces are contested, and how these contests are won.

While hardly conclusive, the example of the Gaza war article provides some good evidence about the nature of contests over content on Wikipedia, and the means used by Wikipedians to resolve them. The Neutrality process established by the NPOV allows for some diversity of opinion to be expressed in Wikipedia articles, however, editors seeking to influence the evolution of articles must be careful to play by the rules. As the example of the debate over the Gaza war’s casualty count shows, those editors that appealed content on the basis of moral values or transcendent standards of “truth” rarely met with success. Instead, these editors were likely to have their work reverted and ignored, even when others expressed some sympathy for their positions. Those editors that followed the neutrality process, using information from verifiable sources, met with more success. However, this process had its own inherent biases. As the distribution of sources cited by the Gaza war article shows, despite the fact that many editors voiced a commitment to using diverse sources for the article, the vast majority of the sources actually cited were either Israeli, or “western,” mostly hailing from Europe and the Americas. The Arab press was under-represented, even where English language sources from the Arab world were available.

Thus, contests over article content on Wikipedia both reproduce and challenge traditional forms of power and privilege. Wikipedia editors sympathetic with the historically less powerful
Palestinians were able to make their influence felt within the shared space of the Wikipedia article documenting the Gaza war. However, doing so required adherence to Wikipedia’s rules of production, rules that privilege western sources. That said, it is important to remember that Wikipedia’s apparent structural bias may not be a crippling defect for the Wikipedia project. Unlike more traditional forms of information production, Wikipedia’s open archives make it possible (though challenging) for readers to learn about the process that created the Wikipedia articles they are reading. This transparency makes Wikipedia’s biases more easily diagnosable by readers, even if the bias remains difficult to treat. Peer production, as seen in this example, is not a radical break with historical power structures, but it is a tantalizingly progressive step.
CHAPTER 7 - CONCLUSION

This dissertation has endeavored to paint a detailed picture of Wikipedia's network of associations, demonstrating how people, texts, and the forms of embodiment both inhabit in the cyborg spaces of our contemporary culture, all come together to make Wikipedia's unique space where traditional geometries of power and privilege are both reproduced and re-negotiated. Understanding how power and privilege works on Wikipedia has implications that exceed the narrow context of the Wikipedia project itself. While I believe Wikipedia's chances to persist as a project for the near future are good, Wikipedia's broad reach as a source for knowledge mean that, even if it disappeared tomorrow, its effects on our societies systems of knowing and believing would continue to be felt. Furthermore, even if Wikipedia itself does someday fade from the scene, the method of production it employs, peer production, is deeply embedded in a variety of other spaces of digital communication and information production, from social media to blogging, and is likely to endure.

In this conclusion, I would like to briefly present what I feel the implications of this picture of Wikipedia are for future scholars and practitioners of peer production. These implications can be organized into three broad categories. First, Wikipedia demonstrates both the limitations and potential of using the ideal body of the cyborg individual as a basis for a new model of political economy. Second, this study has demonstrated the need for new methods to better allow us to understand communities like Wikipedia, in which participants interactions are recorded in a large and sometimes difficult to navigate digital archive. I will suggest some unique challenges this presents for researchers doing work on the Wikipedia community, and suggest some possible methods that might address these challenges. Finally, I will suggest some
The Limitations and Potentials of the Ideal Body of the Cyborg Individual

This dissertation, in many ways, attempts to make a very small, modest contribution to our understanding of the peer production phenomenon by demonstrating how we need to move past the notion of the cyborg individual as a basis for free and just systems for the production of information. At the same time, I have tried to be fair to the cyborg individual ideal by demonstrating its historical roots, and the ways this concept helped to resolve anxieties for the hackers who developed it.

As I discussed in detail in Chapter Three, the ideal body of the cyborg individual responded to the anxieties hackers had about the intimate presence in their lives of computing machinery that was simultaneously made accessible and inaccessible by the use of complex abstractions like source code. Source code rendered computers accessible by making programming a more interactive and intuitive act, and by allowing information to flow from one machine body to another. At the same time, it rendered computers inaccessible by hiding the “bare metal” workings of the machine behind the abstractions of code. This double move was repeated and extended by additional layers of abstraction, including internet protocols. One anxiety hackers experienced as a result of the double move of code was a fear that the machines they had taken into their lives could be influenced against their will, perhaps even without their knowledge, by software manufacturers. To address this fear, the cyborg individual imagined a well-bounded hybrid of human and machine, with distributed small computers firmly under the control of their human owners. FOSS was a means to this end, ironically ensuring that computers would remain property, under the strict control of their owners, by making software, which had...
the potential to wrest this control away, into non-property.

As Chapter Four shows, the extension of the non-property form to information beyond software, was an essential part of what made Wikipedia possible. By releasing the contents of Wikipedia under free license of the GFDL, Wikipedia's founders helped to address early Wikipedians' concern that their work would be alienated from them. Contributors were confident that their work would not be profited from against their consent, at least in part, because they believed that Wikipedia's information, free of legal constraints, could flow freely between many different, essentially equal, forms of technological embodiment. This meant that any contributor unhappy with the use to which his or her work was put was free to “fork” the project, creating a new version of Wikipedia that would conform to their wishes. The history of the GNUpedia project and the Spanish Fork of Wikipedia, however, suggest that this is not in fact the case. Instead, Wikipedia has come to be embodied in a large, centralized server farm. Forks and mirrors of Wikipedia are quite marginal. Rather than guarantee the right of any user to a Wikipedia of their own choosing, the fork instead seems to function as a way for contributors to withdraw their labor from the project if they are unhappy with its direction. In this way, the threat of forking was able to prevent the addition of advertisements to Wikipedia in late 2001.

Thus, rather than a network of small, individually owned machines operated by equals in an egalitarian network – the Cyborg Individual ideal – Wikipedia has in fact come to be embodied in the form of what Nicholas Carr calls an “information utility.” That is to say, as a large, centralized bank of powerful computing devices, which process and store information for widely distributed users. Chapter Five demonstrates how Wikipedia is connected to another large, centralized information utility, the search engine. I demonstrated how Wikipedia and
search engines are connected in an exchange of value, in which Wikipedia depends on search to drive readers and contributors to the site, and search depends on Wikipedia to produce content that makes the search utility more valuable to users. This fact goes largely uncommented on within the Wikipedia community, suggesting that, unlike the direct monetization of Wikipedia that on site advertising represented, editors may not be conscious of, or may not oppose, the profit that search engines gain from Wikipedia content. Furthermore, Wikipedians call on search in the process of editing Wikipedia, using it to help them make decisions about whether articles should be deleted or retained. Wikipedians have developed skills for critically reading search results, which means that while search engines have a powerful influence within the community, they do not determine Wikipedia content.

Some readers may ask why Wikipedia has grown to be embodied in this centralized form, what Nicholas Carr might call an “information utility,” rather than a network of cyborg individuals. This is a question I cannot give any simple answer to. Instead, I can simply point to the complicated historical events I have related here, including the intervention GNUpedia project by Jimmy Wales and the rise of search as a powerful force on the Web, to demonstrate the historical reality of Wikipedia utility form. There is a curious parallel between this evolution, away from small, individually owned computers and toward large, centralized information utilities and the destruction of petite-bourgeois small holders in the rise of monopoly capitalism. Marx, in *The Communist Manifesto*, famously commented on this destruction writing,

> Hard-won, self-acquired, self-earned property! Do you mean the property of petty artisan and of the small peasant, a form of property that preceded the bourgeois form? There is no need to abolish that; the development of industry has to a great
extent already destroyed it, and is still destroying it daily (Marx, 1848).

This parallel, while hardly conclusive evidence of the causation of Wikipedia's current embodiment, suggests that this embodiment may be part of larger trends in capitalism. In any event, Benkler and others never established a firm cause for what they saw as the ascendency of the Cyborg Individual, instead pointing to the historical accident that had distributed computing power broadly among the population. I have simply suggested that the historical trend now seems to be running the other way.

Chapter Six looked at how the Wikipedia community produced a politically fraught article, the article documenting the Gaza war. This process demonstrates several things about the Wikipedia community, and the influence of the information utility embodiment that it relies on. Whereas in the early struggle against advertisements on Wikipedia the editing community was somewhat unified in opposition, in the case of this politically fraught article we can see how the editing community is divided along the lines of other forms of identity, including national identity. The NPOV, which in Chapter Three I argued was formulated, at least in part, to ensure Wikipedia maintained a sufficient supply of volunteer labor by allowing conflicting factions to cooperate in the process of working on the project, was seen in operation in the production of the Gaza war article. By allowing editors to defer judgment on irresolvable questions of “truth” in favor of the more readily solved question of “verifiability,” the NPOV opens a space for some conflicting points of view to collaborate in the shared project, while excluding those who cannot accept the process itself. This “neutrality process” can allow for multiple points of view to be acknowledged within a Wikipedia article, though it also may tend to privilege those points of view with the weight of established sources behind them.
Thus, the ideal body of the cyborg individual has been both a boon and a liability to Wikipedia. In many ways, it is this ideal, with its guarantees of freedom from legal limitations for well-bounded human machine hybrids, that allowed Wikipedia to flourish. By embracing the non-property status of information established by the cyborg individual ideal, Jimmy Wales was able to reassure Wikipedia editors that their labor would not be exploited by others. Furthermore, Wikipedia editors were able to use the threat of forking to prevent the introduction of ads into Wikipedia. However, because the cyborg individual ideal limits its critique of private property to the realm of information, it may have caused both those participating in the Wikipedia phenomenon, and those writing about it, to the shifting embodiment of the real meals of information production. The information utility form that Wikipedia now inhabits limits and bounds the radical power of individuals that Benkler, and others, believed to define peer production. Instead of individuals radically empowered by technology, Wikipedia is characterized by communities negotiating shared values and computing devices. Instead of a web of unique Wikipedia forks, we have a single centralized Wikipedia, whose content is always the subject of contest. Furthermore, other information utilities, like Google are able to profit from free and open information in ways that ordinary citizens cannot, and ways that Wikipedians and others are still unable to fully respond to. Taken together, these observations on the practices of peer production suggest that those interested in intervening in Wikipedia, or other peer-production based projects, might be better served by focusing on changing the terms of negotiation between interested parties, rather than technologically empowering individuals.

Despite its utility, the cyborg individual creates an odd paradox, the paradox of informational property. On the one hand the cyborg individual ideal holds that information must
be non-property, for the control of operating systems and other software by the corporations that
owned them threatened hackers sense of individual autonomy. On the other hand, the
technological basis of that autonomy was perceived to rest on the ability of hackers to own their
own computing devices, which encouraged them to understand the physical means of
information production as property. It is this paradox that we need to move past, and I hope that I
have shown in this dissertation why limiting our understanding of the role of non-property in
informational production to information itself is not enough. The physical means must be
organized as a commons as well.

**Wikipedia Research Methodology: Opportunities and Challenges**

The information utility embodiment of Wikipedia presents challenges to those who would
study the site, as well as Wikipedians themselves. Wikipedia and sites like Wikipedia look to be
important sites of cultural creation for the foreseeable future, so it is important that we learn
ways to study them effectively. For this study I employed an archival method, investigating the
vast archives Wikipedia records of the interactions between community members in an attempt
to reconstruct those interactions and understand them. While this method was useful for
reconstructing the early history of Wikipedia, I believe that this study represents its limits. The
contemporary Wikipedia stores so many records of user interactions that there simply is no way
of conventionally “reading” all of them. Even in the case of the single Gaza War article, the
recorded archives of user interactions was vast and very difficult to navigate.

Existing research uses a variety of techniques to overcome the fact that Wikipedia’s
archives are too vast to be human-readable. Many studies employ machine-aided quantitative
methods, using software to generate statistical information about the Wikipedia database (Ortega,
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2009; Stvilia, Twidale, Smith, & Gasser, 2008; Viégas, Wattenberg, Kriss, & Van Ham, 2007; Viégas, Wattenberg, & Dave, 2004; Viégas, Wattenberg, & McKeon, 2007). Other studies survey a sampling of Wikipedia participants (Kostakis, 2010; Nov, 2007). Still others use ethnographic techniques, relying on the testimony of experienced Wikipedian informants to inform their conclusions (Forte & Bruckman, 2008a, 2008b). All of these methods have important advantages for studying Wikipedia, but also have important drawbacks. Semi-automated database analysis and survey data provide us with a broad overview of Wikipedia, but tend to miss small details. As always, assigning meaning to statistical trends is a difficult process, and some quantitative studies reach conclusions that seem to be entirely divorced from any holistic understanding of how Wikipedia works from the users point of view. The use of informants, on the other hand, provides a good, detailed view of the experience of using and building Wikipedia from the informant's point of view, but may be limited by the selection of subjects and the difficulty of finding and talking to more transient members of the Wikipedia community.

With all this in mind, I call for further development and refinement of hybrid techniques for the study of Wikipedia. Such techniques would combine quantitative and qualitative methods to help researchers both navigate the vast size of the Wikipedia community's records, and make sense of these records in an in-depth way. For example, researchers might use quantitative data on article editing activity to guide qualitative case studies of article development. Real-time monitoring and analysis techniques need to be developed to allow researchers to react to Wikipedia's fast-paced editing environment. Such techniques might use up-to-the minute quantitative data to inform researchers of ongoing debates or other activity on Wikipedia, allowing them to better contact fleeting participants.
Opportunities for Further Research

Over the course of completing this dissertation, I have gained important insights into Wikipedia and the methods needed to study it, insights which can help to guide future research into the sight. In particular, I believe there are two fields of inquiry into Wikipedia that should be expanded and pursued in greater depth. The first is investigation into how Wikipedia is affected by the “live” nature of its text. The ability of Wikipedia to be updated in real time, and the large user community devoted to doing exactly this, makes the form of text the site creates unique. As my investigation into the Gaza war article demonstrates, Wikipedia's editors are often driven to work extensively on articles related to breaking news and current events. Articles documenting conflicts may attract attention from those involved in said conflicts, or those sympathetic to involved factions. These editors may seek to shape the article to reflect their preferred view of the ongoing conflict. In the case of the Gaza war article, we saw how conflicts and negotiations between and among editors sympathetic with both the Palestinian and Israeli sides was mediated by the NPOV to create an article that reflected multiple points of view, while still drawing disproportionately from American and European sources. However, what still needs to be established is how these conflicts play out at various levels of visibility and activity. Not every conflict attracts the same amount of attention as the Gaza war. Might smaller, less well-trafficked articles be “captured” by one faction or another? How do the negotiations reached between faction members during the heat of conflict change over time, as editing activity continues?

In addition, more research is needed for us to fully understand how Wikipedia's incredibly mutable text and its centralized embodiment influence one another. We saw how some early Wikipedians imagined that Wikipedia might be distributed in a manner analogous to Free
Software, which distributes somewhat stable software releases to widely distributed computers. Instead Wikipedia is a constantly changing text strongly tied to a single large embodiment. It seems possible that the need to update Wikipedia's text on a constant basis may privilege the centralized embodiment of Wikipedia. Editors may need a central location to collaborate on the constantly changing text. Readers may tend to privilege the lastest and most recently updated version of the text, found on Wikipedia itself, over older versions, found on mirrors. These possibilities need to be investigated.

Another important area for further research is the connection between Wikipedia and the rest of the web. In this dissertation I investigated the relationship between Wikipedia and search engines, but hardly expended this vein of inquiry. More information is needed about the ways in which search engines re-use Wikipedia information, the ways Wikipedia editors make use of search, and the role of search in driving traffic to Wikipedia. In addition, Wikipedia's high ranking in Google's search results is still not completely understood. A better analysis of which Wikipedia articles have high rankings in Google search, and how the ranking of articles changes over time, is needed.

Furthermore, investigations into links between Wikipedia and a variety of other sites of cultural production are needed. To name just one example, we need a better understanding of the relationship between Wikipedia and its for-profit cousin Wikia. One promising area for investigation would be the transfer of content from Wikipedia to Wikia and vice-versa. Have efforts of the so-called “deletionists” to remove pop-culture articles from Wikipedia driven enthusiasts to the more lenient Wikia? Does this mean that Wikipedia deletionism may increase Wikia's ad revenue? What implications would this have for the political economy of the broader
Wikipedia-Wikia system? Other areas of investigation could include the reuse of Wikipedia content by other sites, and the spread and modification of the Mediawiki software.

**Final Thoughts**

The process of writing this dissertation has been a long one. In the three years since I began my initial research, in the fall of 2007, Wikipedia has continued to grow and change. Over the last three years, Wikipedia has more than doubled in size, with the English Wikipedia going from 1.5 million articles, to over 3 million (Wikipedia:Size of Wikipedia). Wikipedia's policies and practices have also changed and evolved. In late 2009, Wikipedia announced that it would begin a trial of a modification to the Mediawiki software that would allow for more fine-grained control of content added to pages where vandalism could be particularly harmful, such as biographies of living persons. Called “pending changes,” the software modification would require edits by users to be approved by a reviewer before making them visible on the site. These changes to Wikipedia's form and function show how research into the site must continue.

More importantly, however, the larger landscape of digital technology has also continued to change. The smartphone, a nascent phenomenon known only to early adopters in 2007, has become a regular part of the lives of many professionals. In April 2010, Apple released the iPad, a device similar to their iPhone smartphone, but larger and devoid of voice-calling hardware. The iPad received great fanfare as an attractive, capable and user friendly device. Apple sold one million of the devices in the first week of sales. However critics of the device, like science fiction author Cory Doctrow, were concerned about its limitations. Unlike earlier personal computers, the iPad did not behave as the exclusive property of its owner. Instead, Apple exercised considerable control over the device, including the ability to control what software the
iPad would and would not run.

The critics of the iPad are right to be concerned about the power that Apple can exercise over users through its control over their devices. However, in making their critique of Apple, they too often rely on the language of exclusive ownership, and the ideal body of the cyborg individual. In his scathing rebuttal to iPad boosterism, “Why I won't buy an iPad (and think you shouldn't, either),” Doctrow quotes the Maker Manifesto to explain why the iPad is a bad purchase: “if you can't open it, you don't own it” (Doctrow, 2010). I believe that this dissertation has shown that the image of machine mastery Doctrow provides here, while admittedly attractive, has always been an illusion. Instead of technologically empowered individuals charting their own destinies, the example of Wikipedia shows us something very different. A community of users negotiating a shared space, with mutual obligations and often complicated governance procedures. It is my hope that, as we continue to confront the challenges of emerging technologies, we can be guided by this vision of relationships between and among humans and machines, rather than relying on what I believe to be inaccurate and harmful structures based on possessive individualism. If we can do this, perhaps we have a real chance to build a new community of cyborgs.
APPENDIX

March 19, 2008

TO: Andrew Famiglietti
American Culture Studies

FROM: Richard Rowland
HSRB Administrator

RE: Human Subjects Review Board Project No.: H08D254GX2

TITLE: Hackers, Cyborgs, and Wikipedians: The Political Economy and Oppositional Potential of the Wikimedia Constellation

REVIEW DATE: March 18, 2008

APPROVAL EXPIRES: March 17, 2009

RESEARCH CATEGORY: EXEMPT #2

The BGSU Human Subjects Review Board (HSRB) has completed its review of your project involving research with human subjects.

Your project has been approved as submitted.

You are authorized to use human subjects for 12 months, but only in the manner described in your proposal. If you seek to make any changes in your project activities or procedures, those changes must be approved by the HSRB prior to their implementation. Please notify the Board, in writing, (fax: 372-6916 or e-mail: hsrb@bgsu.edu) when you have completed your project. If you have any questions, please contact the Chair of the HSRB or me at 372-7716.

Good luck with your research project. Let me know if this office or the HSRB can be of assistance as your project proceeds.

COMMENTS:

C: Dr. Victoria Ekstrand

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