Introduction

Computing technology has long been associated with grand narratives of progress and potential. However, thanks to the flexibility of the computer metaphor and their sheer number of applications, there are many such narratives, many of them evolving and existing in tension with one another. For example, computing has been associated with both utopian narratives of an increasingly connected society, and dystopian narratives in which computers isolate individuals from one another. In other cases, computers are viewed as great economic equalizers providing the tools of wealth creation to everyone; meanwhile, other narratives view computing as a tool to make human labour obsolete and concentrate power in a wealthy few. There are even those who view computing in almost religious terms, envisioning a *singularity* at which point artificial intelligence will become more capable than humans; this narrative alone is associated with countless utopian and dystopian futures.

I consider a particular tension between two narratives of computing. One narrative considers computers as tools for centralization, scientific analysis, and control over the world. Due to the immense size and cost of early computers, there were few commercial or personal applications; instead, most research funding came from government and military sources. As a result of this early partnership, a culture of computing emerged that prized their utility for large-scale projects and centralized control of complex systems. The second narrative developed alongside the advent of personal computing and believed that the widespread and distributed use of computing would empower and liberate individuals from oppressive hierarchical and institutions. This philosophy emerged out of the *counterculture* of the 1970s and the *cyberculture* of the 1980s and 1990s and continues to influence the culture of Silicon Valley technology companies today. The tension between these two narratives of computing—one of centralized control and the other of distributed liberation—have been visible in the development of computing technologies for decades. For example, Smart Cities infrastructure promises to provide monitoring and control over aspects of cities; meanwhile, open source technologies such as *Linux* and *Wikipedia* were built under the philosophy of distributed contribution and empowering individuals. However, new applications of social media such as Social Media, Big Data, and the Internet of Things complicate these narratives; they use language that centers the individual while simultaneously instituting massive and centralized structures of surveillance and subtle control. This may mean that these older narratives of computing are dying and new ones are forming that will replace them. However, these two narratives of computing may have also been complicated from the start, neither entirely fitting the actual development and use of computing in people's lives.

In this essay I investigate the tension between two narratives of computing, one which considers computers as a means for centralization and control, and another which considers them as tools for individual empowerment and liberation. In the first section I draw on the works of Sherry Turkle, Paul Edwards, and Fred Turner to illustrate the origins of these narratives and the metaphorical power of computing. In the next section I examine the work of David Edgerton to argue that traditional narratives of technology are often misleading and incomplete. To demonstrate the folly of narratives of technological supremacy and control I examine Greg Grandin's history of *Fordlandia*—Henry Ford's failed and abandoned jungle city. I also draw

from Kentaro Toyama experiences with computing in educational and international development to illustrate the challenges of the Silicon Valley narrative of individual empowerment through technology. In the third section I discuss examples of computing used today and how their application further complicates traditional narratives of centralized control and distributed empowerment. Finally, I draw on the work of Natasha Schüll, Siva Vaidhyanathan's, and danah boyd[1], I demonstrate how surveillance became a component of contemporary computing, how the language of distributed liberation has been co-opted for the construction of centralized systems of surveillance and control, and how this new dystopian narrative of surveillance is in some ways complicated by actual uses of technology.

The significance of computing, centralization, and distribution

Of all the technologies of the past century, computers occupy a place of special significance and have become central to notions of progress. In this section, I draw on the works of Sherry Turkle, Paul Edwards, and Fred Turner in order to explore the culture significance of computing and its contribution to distinct narratives of progress. Sherry Turkle demonstrated the ways in which computers fascinate us, from a very young age, and how they have challenged our conceptions of life and mind, serving as powerful and potentially transformative metaphors. One phenomena of computers noted by Turkle was their existence as *rorschach objects*—objects on which people projected their own meanings; as a result, computers have also become central to narratives of progress through centralized control, and distributed liberation. Paul Edwards expanded on the metaphorical power of the computer, noting how computers contributed to powerful society-wide *discourses* about information processing and centralized control. By contrast, Fred Turner keyed into a different thread of computer's cultural history, identifying how their contribution to progress, noting how computers became central to narratives of individual liberation. Understanding the cultural significance of computing and the tension between distinct narratives of progress is important to understanding the place of computers in contemporary society.

Computers occupy a unique role in our imaginations; they shape the way that we think about life, the mind, and our identities. This is what is argued by Sherry Turkle in her book ***Second Self***. Turkle conducted interviews with hundreds of children, adolescents, and adults at a time when personal computers were just becoming common. Framing her analysis in the psychoanalytic tradition, Turkle was able to consider the deeper psychological impacts of computing. Perhaps this is why Turkle's work continues to be relevant in 2019 in spite of the tremendous developments in computing that took place in the intermediate. In various instances, Turkle examined the ways in which humans were challenged by their interactions with computers. Turkle observed how children's conceptions of *life* and *death* were challenged when they played with computerized toys. These toys were not like others; they made sound, they spoke, they moved, they appeared alive, and when their batteries were removed or ran our, they appeared to have died. Computers seemed to have psychological qualities—they were not just machines, but *thinking machines*—and children would often interact with them as though they were aware. The

[1] The scholar danah boyd spells her name using only lowercse characters. I will therefore use only lowercase characters when stating her name except when used at the beginning of a sentence.

marginal status of these computers as *animate objects* challenged the duality between "human" and "think" in children. Turkle also interviewed adults for whom computers held a distinctive metaphorical power. People incorporated language from computing into discussions about their own minds, framing their mental states as "programs" and their needs for therapy or self-help as "debugging"; to these adults, the computer is similar enough to a "mind" that the language can be readily adopted for discussions of psychology and mentality. Turkle also examined computers have come to define certain communities and had become central to people's identities. For example, Turkle explained how adolescents and adults began to define themselves as *technical* or *non-technical* people in regards to their interest and understanding of computers. No group was more technical than those in the so-called *hacker culture*, a community of people for whom computers, and their metaphors, were central. Turkle argued that the ability of computers to challenge conceptions of life, mind, and identify, stems from their status as *evocative objects*—they are objects that are good for thinking with. Computers have become powerful metaphors with which to understand both ourselves and the world; for example, "ping', "bandwidth", "process", and "delete" are just a few examples of how the language of computing has subtly integrated within human language. The computer metaphor is also incredibly flexible; thanks to their r*orschach effect*, or their ability to take on different meanings, the metaphor of the computer has been integrated into the lives of many people and across many communities for different means. Turkle demonstrated that the power of computing stems not only form their position technical capabilities, but from their status as *evocative objects*—powerful and flexible metaphors which can shape our relations with both ourselves and the world around us.

In addition to having reconfigured our notions the self and the mind, the computer as a metaphor for centralization, scientific analysis, and control has shaped social and political discourses in the United States. In his book ***The Closed World*** Paul Edwards discusses the relationship between computers and politics during the Cold War. Computers, Edwards argues, cannot be separated from U.S. grand strategy during the Cold War, and neither can this grand strategy be separated from the effects of computers. Rather, Paul Edwards presents a history of *mutual shaping* in which computers both shaped and were shaped by social factors. Early development of computers emerged from investments by the American military. At a technical level, computers helped increase the speed and agility of warfare and came to embody the "superhuman speed of high-technology war" (pg 312). For example, the proposed high-technology SAGE Missile Defense System laid the discursive infrastructure for future computerized military technology projects and the collaboration between the Military and Academia. At a metaphorical level, computers "..represented a potential for total oversight, exacting standards of control, and technical-rational solutions to a myriad of complex problems" (pg 15). Disciplines such as organizational studies and cybernetics strategy were created which framed humans and organizations in the language of information processing, and shaped the command structure of the U.S. military. In all of these cases the perceived potential of computers lie in their ability to make centralized command and control possible. Edwards history of high-tech military projects and Cold War political and cultural discourse demonstrates the origins of one of the progress narratives of computers—one in which the main potential of computing was aligned with notions of centralization, command, and control.

With the rise of personal computing, another narrative emerve that viewed computers not as tools of increased control, but instead as objects of individual empowerment and resistance to current political regimes. This was the view of computers put forward by the *Whole Earth Catalog*, the the *Whole Earth Network,* and their founder, Stewart Brand—a key figure in the development of both the countercultural movement of the 1970's and the cyberculture movement of the 1990s. Fred Turner traces the paths of these figures in his book ***From Counterculture to Cyberculture***, and in so doing plots the historical development of the cyberculture movement. Turner is interested primarily in the cultural importance of technologies and the social networks that form around them. Blending eastern religious mysticism, cybernetic science, self-sufficiency, and the ideals of communal living, the *Whole Earth Catalog* served as a hub, or a *network forum*, fostering connections and collaborations between the broad and diverse communities constituting the counterculture movement. The primary tenants of this movement centered around anti-authoritarianism, opposition to warfare, and individual empowerment. The advent of personal computing was quickly integrated into this movement and into the Whole Earth Catalog. By linking the counterculture and early technical communities, the catalog synthesized a "social vision in which small-scale informational technologies could be imagined to transform individual minds and, through them, the world" (pg 101)—this became the vision of so-called "digital utopianism". The Whole Earth Catalog and the countercultural movement surrounding it eventually died, however through the ideals of digital utopianism would persist in the new cyberculture movement. Stewart Brand, the founder of the Whole Earth Catalog, identified himself early as a hacker and was involved in creating a series of network forums that bridged the ideals of the countercultural movement with the rising technical movements. In these new communities, the transformative power of small-scale information technology and individual empowerment was highlighted. Under this system of thought, the personal computer was a tool that would allow the *individual* to empower themselves, and it would be through empowering individuals, rather than collective politics, that the world would be transformed. Fred Turner demonstrated how computers became central metaphors in the thinking of cyberculture and the new digital utopianism. Rather than the metaphor of command and control that was central to Cold War politics (Edwards, YEAR), Turner demonstrates a counter-narrative that aligns the computer metaphor with a narrative of individual empowerment.

The dual narratives of progress promised by computers—the potential power of of centralization and distributed liberation—have existed in an ongoing cultural tension. For example, popular *cyberpunk* fiction such as *Neuromancer, Shadowrun* and *Snow Crash* position computers as central to the power of centralized corporatist or authoritarian regimes, yet also these stories also view technical prowess as the means by which the protagonist finds liberation and independence. Computers continue to notions of progress and these same tensions continue to appear in proposals for new technologies. For example, in 2017, the tech company Huawei released their vision of the *Intelligent Operations Center* for Smart Cities—a dashboard for collecting, monitoring, and making decisions about city-level events, promising a level of centralized over information. By contrast, blockchain-based technologies like *Bitcoin* continue to surface, promising currency and other services that are distributed, empowering of individuals, and free of government or corporate interference. Each of these narratives of progress presents different visions of progress and highlight distinct potentials of computers.

The disappointment of progress

In this section, I draw on work that demonstrates that neither narratives of centralized control nor those of distributed liberation are accurate, and that instead the impacts of technology are far more socially and historically contingent. I first investigate the work of David Edgerton who examined a broad history of technology in order to argue that notions of clear and continuous progress are often wrong or misguided. I then focus on Greg Grandin's work on *Fordlandia*—a narrative of failure of centralized control and supposed supremacy of technology. Finally, I examine the experiences of Kentaro Toyama in the field of international development, where he observed the often disappointing results of technologies of distributed liberation. Notions of progress, especially technological and scientific progress, are seductive, however they are also often wrong, misguided, or incomplete. Understanding the state of computing technology, as they fit into these distinct progress narratives, require an understanding of how technology has or hasn't fit with these narratives, historically.

We often like to view progress as a stream of clear events, an inevitable progression of events in which new technologies or discoveries singularly revolutionized the world. However, in ***Shock of the Old***, David Edgerton instead argues that the history of technology is far messier, heterogeneous and contingent than we would tend to believe. In his book, Edgerton dispels with the near-mystical nature of term *technology*, instead considering them as mere objects; in his historical analysis, he adopts a *usage-based* view of the history of technology, one which considers who is using technology and where. In making these two moves, Edgerton eschews grand narratives and focuses almost entirely on the social aspects of technology, rather than the technical. What Edgerton reveals is that the ways that technologies are used is varied, heterogeneous, and messy. Technologies do not develop along any clear and linear path of progress, but instead in starts and stalls, and contingent on local conditions. For example, the invention of the birth control pill seemed to make condoms obsolete; however, the HIV/AIDS crisis quickly lead to a resurgence of this old technology. In other cases, traditional historic narratives are often wrong when examined more deeply; for example, whereas World War II was considered a mechanized war, the British Army ended the war with millions of horses, not to mention the camels or other creatures that were put to use during the war. Supposed advances in technologies may also come with less impact than they seem; for example, Edgerton argues that the United States Railroad—a large and expensive project—had only marginal impact on the country's economic growth. Similarly, the existence of newer solutions does not preclude the use of older and especially effective ones; in a particularly dark chapter of the book, Edgerton notes that many of the killings in recent years have been the result of the machete, not modern alternatives like guns, bombs, or armored vehicles. Despite the prominence of old weapons of killing, the military continues to devote massive resources to the development of technology, forming a military-academic-industrial research partnership that has funded a great deal of research and, in turn 'has pushed technologies towards being more authoritarian than they would otherwise have been (pg 159). By focusing on the actual uses of technologies Edgerton reveals a complicated and messy history that defies clear narratives.

Narratives of progress also breakdown in more dramatic fashion, few instances of which are more dramatic or entertaining as the story Henry Ford's grandiose yet failed attempt to replicate the processes of his Michigan factories in a remote corner of the Amazon rainforest. Greg Grandin, the author of the book ***Fordlandia*** examines this failed jungle city. Much of the book centers on biographies of Henry Ford, a man especially famous at his time and the embodiment of a particular "can-do attitude" that was viewed as central to notions of the "American Dream". Henry Ford became successful for the processes and technologies of centralization and control that he deployed at his factories; he had believed that the superiority of his technology, his funding, and his people, that he could replicate the success of his factories anywhere. As such, Henry Ford set out to develop a rubber plantation in the Amazon Rainforest, made even more ambitious by the goal of replicating the ideals of the American Dream by constructing an American-style city to support the plantation. Grandin's narrative positions the environment of the Amazon as a character in the history of Fordlandia, and at every turn, the Amazon resisted. The site of the city, supposedly free of mosquitos, was not. The lumber that was intended to be sold would begin to rot immediately after being felled. The design of the houses—quintessential americana that would be at home in Michigan—proved to be sweltering huts that were entirely unsited for their new jungle surroundings. Even Henry Ford's own trusted people, free from the expectations and oversight once they were in Brazil, were often unreliable. Whereas Edgerton argued that notions of progress do not explain the actual uses of technology, Grandin's history of Fordlandia demonstrates a case in which Henry Ford attempted to *force* a progress narrative—one of control and technological superiority—and failed. What works in Michigan will likely not be readily replicated in the Amazon; this is because the utility of technology is contingent not only on its social, but also its environmental circumstances.

Computing has also harbored a vision of progress and social change defined not by control or centralization, but instead through the widespread application of small-scale information technology; perhaps nowhere is this vision more apparent than in the use of these technologies for social and economic development. In his book ***Geek Heresy: Rescuing Social Change from the Cult of Technology,*** Kentaro takes aim at technological (especially digital) utopianism by discussing his his experiences and lessons learned while working in international education and of deploying technological solutions to social problems. Toyama considers technology as almost entirely socially-determined, contrary to *mutual shaping* conception of technology adopted by many scholars in STS (e.g., Edwards, 1997). Toyama describes this socially-determined view of technology as the *Law of Amplification*. In some cases, technology can amplify positive human behavior, however the important factor is always ever the human context. For example, a well-supported teacher who devotes time, effort, and attention to their (also cooperative) students may find that technological interventions improves their lessons. However, for less effective teachers, unsupportive school environments, and less disciplined students, technology may instead prove to be a nuisance or a distraction. In all cases, "the technology isn't the deciding factor even in a technology project...The right people can work around a bad technology, but the wrong people will mess up even a good one" (pg 26). Toyama continues to define the dangers of technologies becoming what he calls *packaged interventions*—easy, usually politically expedient technological interventions that promise of solving problems in any social context, but will usually fail. The example Toyama provides is the *One Laptop Per Child* initiative that sought to provide children in developing countries with cheap laptops to aid their education. This initiative

epitomized the potential of small-scale and distributed computing for individual empowerment but what Toyama discovered was that these laptops only ever succeeded when there were good teachers and resources to take advantage of them. Toyama, like Edgerton, centers the human aspects of technology; in doing so, Toyama demonstrates that technology is never a revolution, in and of itself; rather, technology only ever amplifies pre-existing behavior. Social change, therefore, requires human effort and values more so than technological interventions.

These works demonstrate that technology is socially-contingent, and that neither narrative of progress through centralized power nor of distributed empowerment will manifest in all situations. Similarly, there is no clear arc towards "progress", of any kind. Technologies rise and fall, their uses varied and heterogeneous, and will often vanish and then reappear decades later with renewed fervor. Technologies themselves are viewed by these authors as only objects, things which can widen the range of social options or amplify certain human behaviors, but which are never inherently revolutionary and never universally adopted. These works view narratives of technological progress and potential as misleading, almost always overlooking the socially- and environmentally-contingent aspects of how these technologies of actually used. Framed in this way, it becomes clear that the impacts and potential of computing is equally contingent, and that understanding the impacts of computing will require understanding where and how these technologies are used.

Computing in our lives

In this section I argue that the tension between the computing as a metaphor for centralized control, and as a metaphor for distributed and individual liberation, has been complicated by current technologies; in particular, I focus on the role that surveillance has furthered notions of centralization while co-opting the language of individual empowerment. I first draw on the work of Natasha Schüll to discuss how technologies of surveillance and control are subtly developed and deployed in Casinos in Las Vegas. Following this, I present the work of Siva Vaidhyanathan in order to demonstrate how Facebook has made surveillance and centralization central to their business plan while also utilizing the language of personal empowerment. Finally I take a cue from Edgerton and Toyama and discuss the actual uses of social media in the lives of teenagers, as investigated in the work of danah boyd. Together, these work provide a complicated and messy view of the current state of computing, but one that demonstrates how computing has grown to not only defy, but also combine and blend the narratives of centralization and individual empowerment.

Casinos seem, at first, an unexpected location for the development of high-technology however they are at the forefront of new uses of technology for control and surveillance. In her book ***Addicted by Design*****,** Natasha Schüll uses interviews and other ethnographic methods to investigate the uses of technology and design in Las Vegas casinos. What is unique about the technology developed and deployed in these casinos is that they seek control not through coercion of gamblers, but through *collusion* with the gambler. Casinos and gamblers maintained a sort of collaborative relationship in which the gambler sought a state of *flow* which the casino was happy to provide. However, this relationship is asymmetrical—through *collusive technologies*, the casino attempts to amplify the behaviors of the gambler in order to keep them

playing until they reach the point of *extinction*—that point at which they have no money left to spend. In some cases these collusive technologies are not new; for example, the architecture, lighting, interior design, and layout of casinos are intended to encourage gamblers to lose track of time and continue playing. However, the introduction of computing technology has amplified the ability of casinos to subtly control their patrons. For example, computerizing slot machines has allowed casinos to finely tune the mathematics of chance, promoting outcomes that intermittently reward the gambler and encourage them to keep playing, but which will ultimately lead to their extinction. Similarly, computerized displays on slot machines have allowed the casino to make "near misses" appear more often than they would in equivalents, motivating increased play. Computing technologies have also allows casinos to deploy deep surveillance apparatus for monitoring their patrons. By collecting data on individual machines, casinos are able to determine what factors about a machine, such as its location in the casino or its display, maximize their profit. Similarly, casinos also collect profiles on individuals and provide them with personalized incentives to keep them playing. In some cases, slot machines can even adapt to individual players by using visual effects and other subtle nudges to keep them playing. Casinos complicate narratives of computing—whereas traditionally authoritarian views of computing for control focused on the use of these technologies for coercion, the technology deployed by casinos instead seeks to collude with the needs and desires of the individual. Through the tools of surveillance and analytics, computing has been used to amplify the behaviors of the gambler for the ends of profit for the casino.

Social media sites like Facebook have capitalized on the same sort of collusive relationships described by Schüll, aiming to keep users on their site as long and as often as possible; however, while seeking this form of control, Facebook has also employed the language of individual liberation. Siva Vaidhyanathan's, in his book ***Antisocial Media***, draws on examples and theoretical literature to outline the political and social consequences of Facebook. Contrary to other works in this essay, Vaidhyanathan adopts a more technological-deterministic perspective considering not necessary the human factors of social media, but rather the impacts of social media technology on various aspects of society. For example, Vaidhyanathan argues that Facebook's design and algorithms attempt to collude with users, keeping them using social media as much and as often as possible. To customize customize and advertisement, Facebook has also created an extensive surveillance apparatus that collects data from users and non-users alike, data which they use to further subtly nudge their users to continue to view their site. Facebook also lead to the creation of a second kind of surveillance, not of centralized but rather *decentralized* control; online social networks have created a system where everyone surveils everyone else under threat of harassment, humiliation, judgment, or other social consequence. In other instances, Vaidhyanathan argues that Facebook has created filter bubbles and allowed the rapid spread of content which has facilitated the spread of disinformation and hate online; this has in turn contributed to the polarized U.S. political climate and the genocide and displacement of the Rohingya Muslim population in Myanmar. Facebook, like the casinos described by Schüll, seeks to subtly control and surveil their users; however, Facebook has also adopted the language of individual liberation. The culture of Silicon Valley technology companies was heavily influenced by the countercultural and cyberculture movements, and as such, these companies have often echoed the same digital utopian ideals (Turner, 2008). Mark Zuckerberg—the founder of Facebook—was both a product of and contributor to this culture. Zuckerberg advocated for a

kind of corporate responsibility, one in which passionate individuals would create companies and that it would be these companies, not governments or politics, that would result in social change. For Facebook, Zuckerberg employed, and almost certainly believed, the narrative that connecting people with social media would provide them with the tools and experiences to enlighten individuals and improve the world. An example often quoted to support this view is the use of Facebook for political protests where it is believed that the presence of social media amplified the abilities of people to coordinate and protest against authoritarian governments such as during the protests in Ukraine or the Arab Spring; however, Vaidhyanathan argues that this narrative of protests is misleading, and that Facebook has contributed little to effective political movements. By using the language of distributed liberation but the tools of centralized control, Facebook has complicated the narratives of computing.

Social Media technology is perhaps one of the most important applications of computing technology at present and so it has become increasingly important to understand the implications of social media as it is actually used in people's lives. In her book ***It's Complicated: The Social Lives of Networked Teens***, danah boyd draws on ten years of interviews with teenagers and adolescents to investigate how they use technology in their daily lives. Much popular sentiment has decried the affects of Social Media on children and teenagers, believing it to have made teenagers less social and placing them at additional risk. However, by focusing on the actual uses of social media, rather than hypothetical consequences, boyd reveals a much more complicated view of the technology than narratives like Vaidyanathan's indictment of Facebook would lead one to believe. Boyd demonstrates that teenagers, far from being isolated by social media, are in fact isolated by the circumstances of their upbringing; the lives of teenagers are often over-scheduled and overly-protected by loving, yet often paranoid parents. Social Media and other communication technologies offer an outlet for socialization that teenagers might not otherwise have. Boyd also illustrates the ways that teenagers navigate the issues of privacy and surveillance on social media—rather than being concerned over distance and abstract entities like Facebook and the government, teenagers are often much more concerned over surveillance by their parents, teachers, or other authority figures in their lives. To combat this interpersonal surveillance teenagers will enact complicate strategies of privacy management such as dynamically adjusting privacy settings throughout the day and speaking using euphemisms and language that only be understood by members of their in-group. Boyd further complicates the narratives of social media and similar computing technology by focusing on its actual human uses; she demonstrates that "the realities that youth face do not fit into near utopian or dystopian frames, nor will eliminating technology solve the problems they encounter." (pg 213). By focusing on the social dimensions of computing, boyd reveals that the consequences of social media are complicated, and do not fit cleanly into any one narrative.

Notions of computing that emerged from military and government funding promoted a metaphor of computers that highlighted their potential for centralization and control; the counterculture and subculture movements, however, presented a different vision of computers as tools to empower individuals and inspire social change. Whereas these notions have typically been opposed, new applications of computing towards surveillance and data collection have instead merged these metaphors into one. Small-scale information technology and computing is still said to provide the tools and experiences that will enlighten individuals and lead to liberation; however, these

technologies exist within a massive corporate and government surveillance apparatus that is used to exert a subtle yet powerful control over their users. Moreover, these technologies have facilitated new forms of interpersonal surveillance between users, twisting the logic of social connections from a tool of individual empowerment to one that often constraints individuals. However, this form of computing also has benefits—it has provided access to social worlds and information that were previously unknowable or distant. Computing offers potential; however it is also important to understand the implications of these computing technologies in the lives of individuals for whom they have become increasingly important.

Conclusion

Computers have become significant to society and culture, and as such have become central to many grand narratives of progress. In this essay I argued that two particular narratives of computing—of centralized control and distributed liberation—are historically and culturally significant framings of computing but which breakdown when considered in the context of actual applications of computing. I also discussed a new narrative of computing that bridges the language of individual liberation with the structures of centralization and control. This new narrative tends to center around the accumulation of user data for profit or other potential benefit, a process that has been termed *"datification"* (*van Dijck, 2014)*. The technologies of this new narrative center around proving tools and technologies for users while developing infrastructure to monitor and profit from the data of their interactions. Companies will use technologies to develop *collusive relationships* (Schüll, 2014) with their users in order to keep them engaged with their product, viewing advertisements, and generating data to further refine advertising. In other cases companies will profit off of the consumer data more directly by selling it to third party entities.

The emerging *datification* narrative of computing is most salient in Social Media, but has also become common in other commercial areas. For example, the Internet of Things promises decentralized networks of objects, but which will feed data to central databases. Ride-sharing companies like Uber and Lyft have promised decentralized and flexible taxi services, but in doing so have accumulated massive wealth, political clout, and information about user's transportation habits. The datification narrative has also become prominent in scientific research in which *data-driven* science is said to constitute a new paradigm of research, following and separate from computational science (Hey, Tansley, & Tolle, 2009; Mayer-Schönberger & Cukier, 2014).

All the older narratives of computing remain—there are still projects that seek increased centralization and control using data, and other computing projects that aim to use computers to distribute power and influence and provide tools for individuals. However, it is important to acknowledge this new narrative of datafication. Like the old narratives this new narrative often ignores the actual uses of data-driven computing in the lives of people, and so will necessarily be simplistic and misleading. However, just as the old narratives of computing were historically and culturally significant, so too is datification. Understanding this new cultural narrative of computing is vital to understanding the significance of computing more generally.