

## Introduction

The quantified worker is awakened by an electronic device she wears on her wrist. First it is a gentle vibration, then the sensation gradually increases in intensity. The device tracks information on her sleeping habits – when she went to sleep, how long she slept, even whether it was fitful or peaceful sleep. An elevated heart rate – perhaps from vigorous nocturnal activity or perhaps merely a disturbing nightmare – is also noted. Once she is out of bed, the device counts her steps. In the mirror she brushes her teeth vigorously – she hopes that counts for exercise. Because the quantified worker is part of a workplace wellness program, all the information from her electronic device is dispatched to the program and, in return, her employer pays her health insurance premium. To continue with the program, the quantified worker must also exercise for 30 minutes every day; she earns redeemable points each time she goes to a gym because she has a card with an embedded chip that keeps electronic tabs on her gym visits. As part of her wellness program, the quantified worker must also keep a food diary. She is expected to photograph each meal and list the ingredients on an app on her phone. At the beginning of the program, the quantified worker submitted to genetic testing. The result: a genetic profile for the quantified worker outlining her propensity for certain diseases and extrapolating what diet she must follow to maintain optimal health. As part of the wellness program, the quantified worker was encouraged to download a health application on her phone. On this app, she is expected to track all her prescription medications and also her menstrual cycle. There is also an option for tracking ovulation cycles.<sup>1</sup>

For the quantified worker, it is not only her body that is quantified, it is also her mind. To apply for the job, the quantified worker had to run the gauntlet of automated hiring platforms. She acquiesced to platform authoritarianism as the platforms demanded information to shape how she would be presented as a candidate

<sup>1</sup> In 2016, a *Wall Street Journal* investigation found that bosses were using outside firms to track prescription medicine use and to deploy that data to predict which employers were sick or trying to get pregnant. See Rachel Emma Silverman, “Bosses Tap Outside Firms to Predict Which Workers Might Get Sick,” *Wall Street Journal*, Feb. 17, 2016.

and how she could eventually be sorted. Part of the application compelled the quantified worker to take a personality job test. She answered questions such as “How often do you smile per day?” and “Do you find yourself feeling sad for no reason?” Then the quantified worker sat for a video interview. In the comfort of her own home, she sat alone in a room, eyes rigidly fixed straight ahead on her laptop camera. She was careful to never show too much of the whites of her eyes, a sure sign of aggression. Instead, she kept her gaze just slightly narrowed, never looking right and most definitely not left. She stared straight at the camera, making eye contact with the machine. Her friends have told her she tends to speak with her hands, elucidating her points with fluid hand flourishes, so she kept her hands gripped on a pencil on the desk in front of her – like an anchor or deadweight. It is true that this made her feel like she was attempting to speak with a muzzle on, but no matter, she would appear confident to the machine evaluating her. She sat ramrod straight. After all, good posture is a proxy for good character. She reminded herself not to shift in her chair – you don’t want the AI thinking you are shifty, untrustworthy.

Once the quantified worker is hired, mechanical managers become her immediate supervisors. Whether she is hired to an office job where she wears a lapel pin that tracks her movements around the office and might record snippets of conversation, or whether she works a factory job requiring physical exertion where she must wear a safety exoskeleton that can detect whether she is indeed lifting with her knees, her mechanical managers silently and perpetually record her every move. If she works in an office with sensitive information, she might wear a badge with a radio-frequency identification (RFID) allowing her entrance to certain rooms and excluding her from others – for extra convenience, an RFID chip might be inserted under her skin, thereby taking the term *embedded manager* to new heights. If she works in an office, there are cameras everywhere except the bathroom – a code to unlock the bathroom door already documents who enters and for how long. As she sits and types at her computer, her keystrokes are logged. The websites she visits on her computer are logged. And for the hypervigilant employer, there is no need to stand over her shoulder to peer at her computer screen – a program will take a screenshot of her computer screen at whatever interval is required. Her email communications are also tracked. Is she perhaps disgruntled from all the surveillance? Is she planning to leave the company? A program will track her visits and behavior on LinkedIn and will alert her human manager if she proves to be a significant flight risk. Her social media accounts also are surveilled. Any criticism of her employer is flagged: Such action may reflect on her advancement in the company or could lead to dismissal.

If this sounds to you like a dystopian future, you are half correct. This is not the future. It is the current plight of workers. Most workers are now caught up in what scholars such as Shoshanna Zuboff have identified as “surveillance capitalism,” their every move tracked and monitored in service of profit-making. When William Whyte published *The Organization Man* in the fall of 1956, it carried a warning that large American corporations were systemically eroding the individuality of their

workers. Furthermore, Whyte warned, this suppression of individuality would be detrimental, not just to the individual, but also to the corporation itself because of the concomitant loss of creativity and innovation. In addition to Whyte's warning, other books such as *Windows on the Workplace* (1942) and *The Electronic Sweatshop* (1988) have raised questions about the deleterious effects of work technology on worker rights. With this book, I argue that technological advances have ushered in a new era in the workplace – the era of the quantified worker. This new era brings with it new legal challenges, both for the organization and for the worker.

I first started contemplating the quantified worker when I was a graduate student at Columbia University. At that time, as research for my dissertation, I was interviewing formerly incarcerated individuals who were seeking to re-enter society and the workplace. A common refrain emerged from the interviews: "I hate computers." At first, I thought this had to do with computer illiteracy. Many of these individuals had gone to prison in the early 1990s before personal computing had become widespread. I thought their frustration stemmed from their unfamiliarity with digital systems and the internet. But it was something more insidious. These individuals felt themselves shut out by "computers." In seeking to re-enter the workplace, they had confronted automated hiring platforms as gatekeepers. Gaps in their employment history or truthfully checking the box for "Have you been convicted of a crime?" or even merely "Have you ever been arrested?" was enough to get their application "red-lighted" and trashed – never to be considered by a human manager.

The individuals I interviewed were part of re-entry organizations, meaning that they were all actively seeking to re-enter society. They attended anger management classes, interviewing skills classes, and other courses meant to broker the social and cultural capital they needed to re-enter society. They were taught how to dress for an interview, how to firmly shake hands, how to make eye contact and convey confidence. How to speak professionally. How to explain their past criminal circumstances. How to relay the truth of their incarceration in a manner that would make them sympathetic to the hiring manager. But after hundreds of electronic applications that seemed to disappear into the internet chasm, they were starting to realize that none of that mattered. Unlike a human manager, artificial intelligence (AI) in the form of automated hiring lacks discretion. It is an unfeeling and implacable gatekeeper.

*The Quantified Worker* carries a warning – it rings the alarm bell that American workers are increasingly quantified in a manner and to a degree that had been hitherto unknown in history. The quantification of workers is not new; it is as old as the valuation of Roman slaves or the counting of bushels of cotton picked by African slaves in the Americas. What sets this new era of worker quantification apart is that the quantification is now aided by technological advances grouped under the catch-all term of *artificial intelligence*. These new technologies perform automated decision-making with machine learning algorithms, often ignoring the gestalt of the worker in favor of numbers on a screen. The zeitgeist of this new era

of quantification is that it is simultaneously nebulous and impactful; the intangibles of human behavior and genetic predilection concretized as numbers to manage risk and profit for the firm.

First and foremost, this book is meant to serve as an eye-opening account of the impact of technology in the workplace – it is meant to spur academic discourse and further empirical exploration of the issues raised. Second, it is poised to answer this question: What should the law do? Given that the pervasive quantification of workers erodes worker personhood and belies the democratic ideal, how should the law respond? Thus, this is also a legally informed book that grapples with the complex legal questions raised by the introduction of AI technologies in the workplace. This book is also historically informed in that it reaches into the past to trace the development of worker subjugation through quantification as the most recent iteration of scientific management.

An important caveat is that the book's scope is constrained to mapping law and technology issues present within the traditional employer–employee relationship. As such this book does not squarely address the gig economy and other important instances of platform or solely online work. For that, I would point to works by Mary Gray and Siddharth Suri (*Ghost Work*), Niels Van Dorn, and Veena Dubal, among others.

This book puts forth a theory of worker quantification and parses its legal implications for worker voice and worker domination. In doing so, the book describes the breadth of worker quantification as facilitated, and often obfuscated, by modern-day technologies deployed in the workplace. In Part I *The Ideology of Worker Quantification*, Chapter 1 explains how worker quantification sprang from Taylorism and its practiced form, scientific management. Worker quantification is not merely about maximizing profit, but is preoccupied with worker control. Chapter 2 traces the historical responses to quantification in the form of Taylorism and lays out the socio-legal issues raised by scientific management.

Part II, *The Mechanical Managers*, documents the rise of mechanical managers in which the work of hiring, monitoring, and evaluating workers is increasingly being delegated to AI technologies. Chapter 3 focuses on automated hiring systems and platforms, and how bias may become baked into these systems. In this chapter, I examine the question of legal responsibility for preventing discrimination in hiring decisions based on AI and algorithms. Chapter 4 analyzes personality tests used in hiring, showing how such tests may violate medical privacy laws and allow for proxy discrimination against neuro-atypical candidates or individuals with mental illness. Chapter 5 moves on to automated video interviews, demonstrating the significant shortcomings of the pseudo-sciences of facial analysis and emotional recognition, and connects these new technologies to the pseudo-science of phrenology. I explain how reliance on these tools promotes discrimination against various protected groups, and how current laws are limited in their ability to address these problems. Chapter 6, on worker surveillance, explains the history of workplace surveillance and

how the theories behind this practice ignore workers' rights to privacy and dignity in the workplace. Chapter 7 discusses the newest iteration of workplace wellness programs and how they may allow for genetic discrimination. Chapter 8 discusses the greater quantification of health (through surveillance) in the Covid era and how this might present new legal opportunities for health discrimination.

In Part III, *Quantified Discrimination*, I examine the ways in which technology used in the service of worker quantification can both facilitate and obfuscate discrimination on several axes. This is particularly troublesome for its potential to undo the gains for equal opportunity brought about by the Civil Rights Act of 1964 and other anti-discrimination laws. Chapter 9 focuses on wearable technologies as techno-solutions to employer concerns about maximizing profits and minimizing risks. In exploring how wearable technologies blur the line between work and non-work time, I discuss the legal questions of data ownership and control, the misuse and abuse of wearable tech, and the loss of worker privacy and autonomy. Chapter 10 delves into the long-standing issue of quantified racism in the workplace, revealing that workers are not equally quantified and that existing metrics of quantification bear the taint of racial prejudice.

Part IV, *Business Ethics and New Legal Frameworks*, examines ethical issues at the heart of worker quantification, and looks forward to propose new ethical and legal frameworks for tackling the issue of worker quantification. Chapter 11 discusses the ethical dimensions of worker quantification and relies on the legal philosopher John Rawls to argue for a new approach to the adoption of work technologies. In Chapter 12, I put forth proposals for legal frameworks that are more in line with the current capabilities of work technologies and will therefore be more adept at ensuring that workplace technologies do not contribute to worker domination.

We tend to think of a singular future of work. However, this tendency is a product of techno-fatalism – the belief that we must acquiesce to the unsavory unintended consequences of technology in exchange for reaping its benefits. Yet, many different futures of work are possible. Thus, in my conclusion, I imagine a future where data can be harnessed in the service of worker power. I contemplate how unions of the future could work together with organizations and corporations to transform the data in “data-driven workplaces” from driving whip to collaborative knowledge. Finally, I note that techno-solutionism can never be the full answer. Neither can we rely on business ethics as a self-policing measure for organizations. Technological innovation has served as a Trojan horse for surveillance technologies, and the law must act as a true bulwark against the rising inequality introduced by these technologies. In practice, this means the implementation of targeted laws and regulations that are intelligently tailored to address the discriminatory potential of our new mechanical managers.

PART I

The Ideology of Worker Quantification

## 1

## The Rise of Scientific Management

The majority of these men believe that the fundamental interests of employees and employers are necessarily antagonistic. Scientific management, on the contrary, has for its very foundation the firm conviction that the true interests of the two are one and the same; that prosperity for the employer cannot exist through a long term of years unless it is accompanied by prosperity for the employee, and vice versa; and that it is possible to give the workman what he most wants – high wages – and the employer what he wants – a low labor cost – for his manufactures.

–Fredrick Winslow Taylor, *The Principles of Scientific Management*

The information revolution has ushered in a data-driven reorganization of the workplace, where Big Data, and the machine learning algorithms that can run them, are deployed to make meaning out of a mountain of minutiae of workers' actions and behaviors. As a 2013 *New York Times* article noted, “today, every e-mail, instant message, phone call, line of written code and mouse-click leaves a digital signal. These patterns can now be inexpensively collected and mined for insights into how people work and communicate, potentially opening doors to more efficiency and innovation within companies.”<sup>1</sup> While some may refer to this new data-preoccupied “workforce science”<sup>2</sup> or “people analytics”<sup>3</sup> as a boon to workplace efficiency,<sup>4</sup> others see instead a digital panopticon.<sup>5</sup> Although debates about worker surveillance and employer attempts to measure worker efficiency are not new controversies, what is novel is the manner and degree to which workers are now being quantified. Given recent technological developments such as the mass collection of data

<sup>1</sup> Steven Lohr, “Big Data, Trying to Build Better Workers,” *New York Times*, Apr. 20, 2013.

<sup>2</sup> See Alec Levenson and Gillian Pillans, *Strategic Workforce Analytics*, Corporate Research Forum Report, Nov. 2017.

<sup>3</sup> See Jean Paul Isson and Jesse S. Harriot, *People Analytics in the Era of Big Data* (Hoboken, NJ: Wiley, 2016).

<sup>4</sup> Peter Cappelli, *The Future of the Office* (Philadelphia: Wharton School Press, 2021).

<sup>5</sup> Olivia Solon, “Big Brother Isn’t Just Watching: Workplace Surveillance Can Track Your Every Move,” *The Guardian*, Nov. 6, 2017.

(dubbed “Big Data”) and the computerized algorithms that may perform rapid analyses on those data while also creating *de novo* models for analysis (machine learning algorithms), the characteristics, skills, and outputs of the contemporary worker have become *quantified* in a manner and to a degree previously unseen in history. This quantification in turn is changing the very nature of work, blurring boundaries between work and nonwork and raising new legal questions about employee privacy, worker power and autonomy, and the limits of employer control over the worker.

It is a given that new technology is constitutive, that is, new technology changes the way we view the world and can, in fact, constitute the world and social relations anew. However, it is often overlooked that technology and ideology are co-constitutive. In other words, technology only exists insofar as it is conceived as part of an ideology and is used in service of that ideology. Thus, technology is never neutral: Embedded in both its design and use cases are theories of what is and what ought to be. For example, Jayaweera and Amunugama make the distinction between inventions (as a priori neutral objects) and technology as objects or processes arising out of “a particular meeting of economic, social, and political circumstances which automatically guarantee its exploitation and conversion into an instrument of economic and social power.”<sup>6</sup> Technology does not spring from the ether and does not exist in a vacuum. Rather, it sprouts in a political economy steeped in history. Technology is both a product and response to the socio-political zeitgeist of its time. Thus, technology is both made available and shaped by extant legal frameworks. Co-constitutively, new legal frameworks are in turn prompted by new technology use cases.

Jürgen Habermas, a sociologist of critical theory and technology, warned that technology only *appears* to be autonomous from societal ideology, but that this is far from reality.<sup>7</sup> As Dutton subsequently noted, emerging technologies have the tendency to “reinforce” the interests of the holders of power in organizations; thus, without legal interventions, new technologies arrive poised to automate the bias of the power elite.<sup>8</sup> Furthermore, technology is not limited to merely fulfilling a job task or work purpose; rather, the function of any given technology will morph to coincide with the organizational characteristics of the organization in which it is used. In turn, technology will also have its own organizational effects that impact the work environment and lives of workers. Robey found that computer technology within stable organizational environments is deployed to further centralize control, while the same technology within unstable organizational environments is used to

<sup>6</sup> Neville Jayaweera and Sarath Amunugama, *Rethinking Development Communication* (Singapore: Asian Mass Communication Research and Information Centre, 1987).

<sup>7</sup> Jürgen Habermas, *Theory and Practice*, trans. John Viertel (Boston: Beacon Press, 1971). See also Jürgen Habermas, *Knowledge and Human Interests*, trans. Jeremy J. Shapiro (Boston: Beacon Press, 1971).

<sup>8</sup> Susan E. Jackson and Jane E. Dutton, “Discerning Threats and Opportunities,” *Administrative Quarterly* 33, no. 3 (1988): 370–87; Jane E. Dutton and Jane Webster, “Patterns of Interest Around Issues,” *Academy of Management Journal* 31, no. 3 (1988): 663–75.



further decentralize functions.<sup>9</sup> This is readily apparent today in a comparison of the use of artificial intelligence (AI) technologies in the gig economy versus traditional workplaces. Work technologies of today come imprinted with ideologies about worker power, or the lack thereof. Today's work technologies reinforce attitudes and beliefs about how far the employer is entitled to seek control over workers.<sup>10</sup> Furthermore, they bring to high relief the gray areas in the law concerning protections for workers and their rights. The end result is a pressing societal imperative to reach a consensus on new legal regimes and social choices necessary to maintain fundamental societal values of democracy and liberty.

The mention of social choice is to underscore that this book is decidedly anti-technological determinism or, to acknowledge its most recent iteration, anti-techno-fatalism. Veblen posits work technology as always in full control:

The machine throws out anthropomorphic habits of thought. It compels the adaptation of the workman to his work, rather than the adaptation of the worker ... the machine process gives no insight into questions of good or evil, merit or demerit, except in point of material causation, nor into the foundations or the constraining force of law and order ...<sup>11</sup>

To accept Veblen's description as a foregone fact is both techno-determinist and techno-fatalistic. To see it as what it is – a description of one possible future of technology – is techno-realist. As Held notes, “technocratic consciousness fulfils the ideological function of legitimating the pursuit of particular interests. It conceals behind a façade of objectivity the interests of classes and groups that actually determine the function, direction, and pace of technological and social developments.”<sup>12</sup> Hill concurs in his assessment and argues against attributing power solely to the potential of technology. Furthermore, he notes, “Social, economic, and political negotiations are involved in bringing particular technological systems into existence.”<sup>13</sup> The law plays a large part by legitimizing or delegitimizing specific use cases for technology: It allows or disallows the continued existence of certain types of technologies and signals ahead for what new technology may be brought into existence.

Legal scholars, more so than others, have started to buck the passivity of techno-fatalism. From Frank Pasquale's *The Black Box Society*, in which he calls for the regulation of the shadowy data brokers that have mushroomed as a result of the

<sup>9</sup> Daniel Robey, “Computers and Management Structure: Some Empirical Findings Re-examined,” *Human Relations* 30, no. 11 (1977): 963–76.

<sup>10</sup> See A. Rodder, “Technologies of Control: The Construction of the Modern Worker” (MS thesis, University of Oslo, 2016).

<sup>11</sup> Thorstein Veblen, *The Theory of Business Enterprise* (New Brunswick, NJ: Transaction Books, 1904), 310–11.

<sup>12</sup> David Held, *Introduction to Critical Theory: Horkheimer to Habermas* (Berkeley: University of California Press, 1980), 264–65.

<sup>13</sup> Stephen Hill, *The Tragedy of Technology: Human Liberation versus Domination in the Late Twentieth Century* (London: Pluto Press, 1988), 6.

information revolution,<sup>14</sup> to Julie Cohen's *Between Truth and Power*, which highlights the configurability of networked information technologies as battlegrounds for well-resourced parties to shape their development, to scholars like James Grimmelman who maintains that algorithmic subjects "deserve a better explanation than 'the computer said so'," legal scholars exhort us to ask questions about the undesirable effects of technology on society and whether these effects should be accepted as inevitable.<sup>15</sup>

### 1.1 THE THEORY OF WORKER QUANTIFICATION

My theory of worker quantification hinges on the observation that AI technologies have been deployed to work concurrently and cumulatively to quantify not just worker productivity, but also all aspects of worker behavior. Whereas the concept of scientific management was focused on quantifying the work, chipping work into concrete and minute tasks that could be both quantified and standardized for great efficiency gains, the workforce science of today, as an iteration of scientific management, goes far beyond that. Now, it is not merely the job task that is being quantified, but it is also the worker's health through workplace wellness programs, the worker's mental state through personality job tests, and the worker's social behavior through workplace surveillance and the monitoring of social media.<sup>16</sup> To be sure, worker quantification is enabled, facilitated, and driven by technological advances, but the impulse toward worker quantification also derives from the ideologies that came before those technological advances.

### 1.2 NOT ANTI-TECHNOLOGY; RATHER, PRO-REGULATION

One common response to critiques of new technology is the accusation of Luddism. Yet, as some have observed, this accusation misdiagnoses the problem. As early as 1984, political scientist Raphael Kaplinsky contended, "The problem lies not with the technology but in a form of social organization which misuses its potential to produce frighteningly destructive weapons, inappropriate products and undesirable work processes."<sup>17</sup> As Keith Grint and Steve

<sup>14</sup> Frank Pasquale, *The Black Box Society: The Secret Algorithms that Control Money and Information* (Cambridge, MA: Harvard University Press, 2015).

<sup>15</sup> James Grimmelman and Daniel Westreich, "Incomprehensible Discrimination," *California Law Review Online* 7, no. 1 (2017): 164.

<sup>16</sup> See Indy Wijngaards et al., "Worker Well-Being: What It Is, and How It Should Be Measured," *Applied Research in Quality of Life* 17 (2021): 795–832; Fred Oswald, "Can a Personality Test Determine if You're a Good Fit for a Job?" *Speaking of Psychology* (blog), interview with Fred Oswald, PhD, episode 150, July 2021, [www.apa.org/research/action/speaking-of-psychology/personality-tests](http://www.apa.org/research/action/speaking-of-psychology/personality-tests); Kathryn Zickuhr, *Workplace Surveillance Is Becoming the New Normal for U.S. Workers*, Report, Washington Center for Equitable Growth, Aug. 18, 2021.

<sup>17</sup> Raphael Kaplinsky, *Automation: The Technology and Society* (London: Addison-Wesley Longman Ltd., 1984).