HARPER'S

THE SPY WHO FIRED ME

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Last March, Jim Cramer, the host of CNBC's *Mad Money*, devoted part of his show to a company called Cornerstone OnDemand. Cornerstone, Cramer shouted at the camera, is "a cloud-based-software-as-a-service play" in the "talent-management" field. Companies that use its platform can quickly assess an employee's performance by analyzing his or her online interactions, including emails, instant messages, and Web use. "We've been managing people exactly the same way for the last hundred and fifty years," Cornerstone's CEO, Adam Miller, told Cramer. With the rise of the global workforce, the remote workforce, the smartphone and the tablet, it's time to "manage people differently." Clients include Virgin Media, Barclays, and Starwood Hotels.

Cornerstone, as Miller likes to tell investors, is positioning itself to be "on the vanguard of big data in the cloud" and a leader in the "gamification of performance management." To be assessed by Cornerstone is to have your collaborative partnerships scored as assets and your brainstorms rewarded with electronic badges (GENIUS IDEA!). It is to have scads of information swept up about what you do each day, whom you communicate with, and what you communicate about. Cornerstone converts that data into metrics to be factored in to your performance reviews and decisions about how much you'll be paid.

Miller's company is part of an $11 billion industry that also includes workforce-management systems such as Kronos and "enterprise social" platforms such as Microsoft's Yammer, Salesforce's Chatter, and, soon, Facebook at Work. Every aspect of an office worker's life can now be measured, and an increasing number of corporations and institutions—from cosmetics companies to car-rental agencies— are using that information to make hiring and firing decisions. Cramer, for one, is bullish on the idea: investing in companies like Cornerstone, he said, "can make you boatloads of money literally year after year!"

A survey from the American Management Association found that 66 percent of employers monitor the Internet use of their employees, 45 percent track employee keystrokes, and 43 percent monitor employee email. Only two states,

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Delaware and Connecticut, require companies to inform their employees that such monitoring is taking place. According to Marc Smith, a sociologist with the Social Media Research Foundation, "Anything you do with a piece of hardware that's provided to you by the employer, every keystroke, is the property of the employer. Personal calls, private photos—if you put it on the company laptop, your company owns it. They may analyze any electronic record at any time for any purpose. It's not your data."

With the advent of wireless connectivity, along with a steep drop in the price of computer processors, electronic sensors, GPS devices, and radio-frequency identification tags, monitoring has become commonplace. Many retail workers now clock in with a thumb scan. Nurses wear badges that track how often they wash their hands. Warehouse workers carry devices that assign them their next task and give them a time by which they must complete it. Some may soon be outfitted with augmented-reality devices to more efficiently locate products.

In industry after industry, this data collection is part of an expensive, high-tech effort to squeeze every last drop of productivity from corporate workforces, an effort that pushes employees to their mental, emotional, and physical limits; claims control over their working and nonworking hours; and compensates them as little as possible, even at the risk of violating labor laws. In some cases, these new systems produce impressive results for the bottom line: after Unified Grocers, a large wholesaler, implemented an electronic tasking system for its warehouse workers, the firm was able to cut payroll expenses by 25 percent while increasing sales by 36 percent. A 2013 study of five chain restaurants found that electronic monitoring decreased employee theft and increased hourly sales. In other cases, however, the return on investment isn't so clear. As one Cornerstone report says of corporate social-networking tools, "There is no generally accepted model for their implementation or standard set of metrics for measuring R.O.I." Yet this has hardly slowed adoption.

I first got interested in the data-driven workforce not long after I moved from a dilapidated apartment in Brooklyn that had a live-in super to a slightly more solid walk-up that does not. I began to notice something frustrating about my UPS deliveries. They never arrived. When I wasn't home, I'd leave a note asking for packages to be left at the laundromat on the corner. I'd get an attempted-delivery note instead. The same thing sometimes happened even when I was home—I'd find an attempted-delivery note, but no one had rung my doorbell. Packages were routinely returned to sender. Then I learned about UPS's use of something called telematics.

Telematics is a neologism coined from two other neologisms—telecommunications and informatics—to describe technologies that wirelessly transmit data from remote sensors and GPS devices to computers for analysis. The telematics system that now governs the working life of a driver for UPS includes handheld DIADs, or delivery-information acquisition devices, as well as more than 200 sensors on each delivery truck that track everything from backup speeds to stop times to seat-belt use. When a driver stops and scans a package for delivery, the system records the time and location; it records these details again when a customer signs for the package. Much of this information flows to a supervisor in real time. The Teamsters, the union that represents UPS employees, won contract language that says drivers can't be fired based solely on the numbers in their telematics reports, but supervisors have found workarounds, and telematics-related firings have become routine.

One warm day last fall I met with a man I'll call Jeff Rose, who for the past fifteen years has driven a UPS delivery route in a working-class neighborhood in one of New York City's outer boroughs. He was taking his two o'clock lunch break at a diner on the corner of a modest commercial strip and a leafy residential street. Rose, who asked that I not use his real name, said that telematics was introduced as a safety measure when it was rolled out in New York six or seven years ago. Lists were posted at distribution centers to shame the biggest seat-belt scofflaws. But safety is not the reason given for telematics on UPS investor calls. On those, executives speak instead about the potential for telematics to save the firm $100 million in operating efficiencies, including reductions in fuel, maintenance, and labor.

Indeed, around the time telematics was being introduced in New York, UPS began to increase the number of stops on each route. At morning meetings at the distribution center, Rose told me, supervisors would announce, "Hey, your stop count is going up by ten." As recently as a decade ago, a driver's stop count might be eighty-five, but in recent years it rose to ninety-five, then a hundred. These numbers are reflected in UPS corporate filings, which show that daily domestic package deliveries grew by 1.4 million between 2009 and 2013, the years in which telematics was being rolled out—and these additional packages were delivered by a thousand fewer drivers. Total domestic employees shrank during the same period by 22,000.

These days, on an average shift, Rose makes 110 stops and delivers 400 packages. He leaves his house at seven in the morning and seldom gets home before nine-thirty at night, when he is so exhausted that he rarely makes it to bed—he grabs dinner and passes out on the couch. "If you go to one of these UPS facilities at shift-change time, you'd think you were at a football game, the way people are limping, bent over, with shoulder injuries, neck injuries, knee injuries," said David Levin, an organizer with Teamsters for a Democratic Union, a reform caucus within the Teamsters. "It's fifteen years of rushing, rushing, rushing, working when you're exhausted, working those long days, running up and down stairs with boxes."

Rose told me he knows at least ten drivers at his facility who have had knee or shoulder surgery. He suffers from chronic back pain, but a surgeon told him there was no point in operating—he has so many different injuries that surgery won't help. UPS coaches drivers to follow eight rules for safe lifting, which Rose rattled off

the data from a single driver's shift can be up to forty pages long. There might be a page dedicated to backing-up events, another for stop times, and so on. But sprinting to an apartment and slapping a delivery-attempt notice on the door without ringing the bell or waiting for someone to make it down a three-story walk-up—well, that's a shortcut UPS's telematics system would have no way of catching.

After lunch, I trailed Rose on his route for a few hours. He told me that he refuses to sprint anymore—"This job is the long haul"—but from the moment he swung into his seat, he was constantly in motion. I lost him immediately, on the way to his first stop, when he zipped through an intersection just before the light turned. At his third stop, he pulled a small box from the front of the truck; once he was buzzed in, he bounced up a steep flight of stairs. At the next stop, the boxes were larger, so he had to come around back, pull up the heavy bulkhead, and use a hand truck.

At another stop, Rose had to make multiple trips, with a mix of small and large packages. We were nearing rush hour, and many of the cars around us were honking aggressively. With each new batch of boxes, Rose jaywalked across the street; walking to the corner and crossing at the light would have cost far too much time. It was a balmy day, with a clear sky. I tried to imagine him doing this when the streets were icy and the gutters running with slush. I recalled one driver I'd read about who'd been hit by a car while making deliveries during the 2012 holiday rush and ended up in a ten-day coma.

In recent years, many companies have followed UPS's lead: telematics is expected to become a $30 billion industry by 2018. David Cozzens is the CEO of Telogis, a company that provides telematics to commercial-trucking fleets, including those of AT&T and Coca-Cola. He recalled the thrill he felt entering the field only seven years ago: "It was big data. It was the Internet of things. It was

by heart: "Get close to the object; have your feet shoulder-width apart; bend your knees; test the package for shifting weight; grab at opposite corners; lift in one fluid motion; keep it within your power zone; pivot, don't twist." But, he said, "if I did those eight things for each box, how productive would I be?"

Thanks to telematics, Rose's supervisor can answer that question minute by minute. For every driver within his purview, he can monitor a neighborhood map with the driver's route traced in teal and the stops marked and numbered. Another window shows a complete list of addresses on the route and the number of packages per address. A third window shows the driver's speed, whether the engine is off or on, whether the

bulkhead—the massive, rolling rear door—is open or closed, whether the seat belt is engaged, whether the driver is backing up, and more. In the center of the screen, a fourth window shows the number of minutes allotted per stop and whether the driver is under or over that target.

I saw a video capture of a telematics report from a facility in Queens that made clear just how unrealistic those allotments are. Every few stops the driver beats his time by a second, or by nineteen seconds, or even by a minute. But more often than not, the driver goes over, by three minutes, or four, or even ten. As I watched, the driver's cumulative over/under number kept creeping up, until it was north of four hours over. At the same time, safety measures, like seat-belt use, got spotty. A printout of

cloud computing; it was mobile; it was really a new market, with low penetration." He champions the technology as a way to boost workforce productivity while also being environmentally friendly. UPS claims that in 2010 telematics saved 1.7 million driving miles, 15 million minutes of idling time, and 103,000 gallons of gas. (Total daily gas usage in the United States is 368 million gallons.) Cozzens said some Telogis clients have realized efficiencies that allowed them to eliminate as many as 10 percent of their vehicles. "Project that on a broad scale. Those are big numbers in terms of sustainability."

A Telogis system plugs into a vehicle's electronic control system, where it pulls information on everything from braking time to windshield-wiper use; this is combined with GPS and weather data, current and historical traffic information, and specific notices about, say, tunnel height or washed-out bridges that are collected from the 140,000 vehicles using the company's navigation software. Some Telogis clients use the systems to save fuel, by reducing idling time and optimizing routes; others seek to maximize use of their fleet. Still others are looking for productivity improvements from their drivers. Industry adoption of telematics, a Telogis spokeswoman estimates, is around 20 percent to date. "Now it's starting to be, 'I have to have it,'" Cozzens said. "'How are we going to harness this data? We're not going to be successful if we don't do it, because our competitors are going to.'"

In workshops at a National Association of Fleet Administrators conference in Minneapolis last spring, the rush to adopt telematics was apparent. Firms that had already installed the systems had done it so quickly that managers were struggling with implementation. Forty-four telematics vendors were exhibitors at the expo, and there were entire workshops devoted to "K.P.I.'s"—key performance indicators—in which fleet managers gathered in the hope of learning how to adapt to these new systems. "You can't manage what you can't measure," a slide in one workshop explained. After a list of dozens of potential K.P.I.'s flashed on the screen,

the presenter said, "As you can see, there are a lot." Another presenter said that managers are exerting "more pressure for more detail. More, more, more!" Someone expressed a wish for a "killer K.P.I.," a supermetric that could boil all of the data down into a single big, shiny, decisive number.

At one point the conversation shifted to drivers' reactions to the new technology, which surveys have shown to be overwhelmingly negative. One poll of fleet managers in the U.K. found that almost 80 percent had experienced resistance when implementing telematics; half of them had experienced a "significant amount." I spoke with one woman at the conference who was a fleet manager for a firm that supplies hospitals with rental equipment such as ventilators. When she introduced telematics to her fleet, she said, drivers worried that they'd get fired for going to the bathroom or stopping for lunch or speeding. Many were. Some supervisors, who were now able to see real-time data on speed and idle time, "probably watched it more than they needed to," she said, and responded "with a harshness."

Another woman told a workshop that at her firm, drivers got paid by how many jobs they delivered. "So we're telling them to produce as much as you can—but don't speed. It's a catch-22." Steve Jastrow, a consultant at GE Capital Fleet Services, advised managers to describe telematics as a safety initiative, just as UPS had done. "How you present it to the driver may be different than how you present it to senior management," he said.

"The important thing is where the power lies," said Zingha Lucien, another fleet consultant. "Drivers might not be happy being measured, but in the end they will yield."

Jeff Rose saw evidence of this in a Daily Recap I obtained from a UPS center in New York. The document contains a summary of each driver's metrics. He pointed out that all of the drivers were over their allotted times by at least an hour or two, except for a handful of trainees, some of whom came in as much as two hours *under*. Rose told me that there's no way drivers could be beat-

ing their time quotas by that much without sprinting the entire day and recklessly cutting corners on safety.

A UPS spokesperson told me that telematics has improved safety overall and lifted seat-belt compliance to an "almost perfect" 98.8 percent. But UPS drivers tell a different story. One wrote on an online forum about a new hire who was beating his quota by an hour and a half to two hours every day. "This guy has literally told me he will buckle the seat belt behind him and not wear it," he wrote, saying the driver also has high backing speeds, an "absurd amount of bulkhead door events"—driving with the back door open—and many misdelivered packages.

"People get intimidated and they work faster," Rose told me. "It's like when they whip animals. But this is a mental whip."

W henever you drive up to a McDonald's window, or push your grocery cart to a Stop & Shop checkout line, or head to the register at Uniqlo with a blue lambswool sweater in hand, you, too, are about to be swept up into a detailed system of metrics. A point-of-sale (P.O.S.) system connected to the cash register captures the length of time between the end of the last customer's transaction and the beginning of yours, how quickly the cashier rings up your order, and whether she has sold you on the new Jalapeño Double. It records how quickly a cashier scans each carton of milk and box of cereal, how many times she has to rescan an item, and how long it takes her to initiate the next sale. This data is being tracked at the employee level: some chains even post scan rates like scorecards in the break room; others have a cap on how many mistakes an employee can make before he or she is put on probation.

Until recently, most retail and fast-food schedules were handmade by managers who were familiar with the strengths of their staff and their scheduling needs. Now an algorithm takes the P.O.S. data and spits out schedules that are typically programmed to fit store traffic, not employees' lives. Scheduling software systems, some built in-house, some

by third-party firms, analyze historical data (how many sales there were on this day last year, how rain or a Yankees game affects revenue) as well as moment-by-moment updates on the number of customers in the store or the number of sweaters sold in the past hour or the pay rate of each employee on the clock—what Kronos, one of the leading suppliers of these systems, calls "oceans of valuable workforce data." In the world of retail, all of this information points toward one killer K.P.I.: labor cost as a percentage of revenue.

In postwar America, many retailers sought to increase profits by maximizing sales, a strategy that pushed stores to overstaff so that every customer received assistance, and by offering generous bonuses to star salespeople with strong customer relationships. Now the trend is to keep staffing as lean as possible, to treat employees as temporary and replaceable, and to schedule them exactly and only when needed. Charles DeWitt, a vice president at Kronos, calls it "the era of cost."

Workforce-management technologies make productivity visible and measurable, allowing employers to distinguish between labor time that generates profits and labor time—down to the minute—that does not. Kronos systems promise to "optimize the workforce" to deliver "the lowest cost schedule." The system doesn't necessarily lead to clients cutting employees' hours, DeWitt told me. "If they don't have these tools, they'll understaff, which will lead to customer dissatisfaction. It only takes two to three bad experiences for a customer to leave a brand forever." But he said that overstaffing can be a bigger problem: "If you have chronic overstaffing, you're just not going to be competitive and you'll drive yourself out of business." A large company can easily pay $1 million a year for a third-party service. Kronos, whose client roster includes retail giants such as Starbucks, Stop & Shop, and Payless, brought in $1 billion last year. Occasionally such software systems are customized: at Macy's it is My Schedule Plus; at McDonald's it is called R2D2.

Carrie Gleason, a former union organizer who now runs a national campaign called the Fair Workweek Initiative, recalled that back in 2005, when she first began organizing retail workers, employees at stores like JCPenney were still mostly full-time, and many had health insurance. "Over the years I heard more and more workers talk about how they weren't getting enough hours," she said, "and how their managers ignored their availability." The news filtered in from the retail workers she spoke with: the Gap was scheduling four-hour shifts; DSW salespeople were getting only twelve hours of work a week; at some stores Zara was changing employees' schedules without notice, leading many to snap photos of posted schedules to avoid getting disciplined for missing a shift they weren't aware they had; Abercrombie & Fitch employees started receiving entire schedules composed of on-call shifts that never materialized. Facebook pages began to crop up for workers desperate to pick up extra hours—or to get someone to cover a shift they'd been saddled with on little or no notice. Employees were slowly being turned into day laborers. The federal Bureau of Labor Statistics has reported that the number of retail employees involuntarily working part-time more than doubled between 2006 and 2010, from 644,000 to 1.6 million.

The experience of Allison Santana, a mother of four in Chester, Pennsylvania, illustrates the new normal. She was hired as a Starbucks barista two years ago. The starting wage was low—$7.60 an hour—but she thought she could scrape by with the twenty-eight to thirty-eight hours a week she was promised. She got far fewer, however, usually eighteen hours, made up entirely of four- or five-hour shifts. "Instead of having four people work seven a.m. to three p.m., like at a regular job, it would be me and someone else opening the store at four a.m., then at six another person, then maybe at seven-thirty another person comes in. And most of them wouldn't stay till three," she said. "It's cutting that labor, saving that labor, that's the whole deal of the software."

Santana supplemented her Starbucks earnings by working nights at a

hotel. Her manager knew about the job, but that didn't stop the software from spitting out shifts that started while she was still at the hotel. She used state-subsidized day care for her children, but the facility required her to specify her schedule in advance, and Starbucks rarely gave her enough notice to do so. Plus the day care was only open Monday to Friday, and Starbucks mostly gave her weekend hours. She lost her spot at the facility and ended up leaving her kids with her mom, who was juggling three young children of her own. Santana's child-care troubles were not considered an acceptable excuse for missing a shift. Her manager wouldn't even excuse co-workers who missed work for a child's graduation or a loss in the family. In exchange for twenty hours of low-wage work each week, staffers gave up control over their lives. (Last August, in the wake of a *New York Times* exposé, Starbucks announced a new policy that will give employees a week's notice of their schedules; meanwhile, Santana has been promoted and her hours have stabilized. A spokesperson said that company policy allows up to four days of bereavement leave and that store managers "work hard to give partners the hours they want.")

A 2010 management survey led by Susan Lambert of the University of Chicago found that 62 percent of retail jobs are now part-time and that two thirds of retail managers prefer to maintain a large workforce, to maximize scheduling flexibility, rather than increase hours for individual workers. In 2012, a study of retail workers conducted by the Retail Action Project and Stephanie Luce of the City University of New York found that unstable scheduling, with radical changes from week to week, was common, as was extremely short notice. Only 17 percent of surveyed workers—and just 10 percent of those who were part-time—had a set schedule; only 30 percent received their schedule more than a week in advance. Schedules often had set start times, but many shifts ended abruptly as soon as business declined. One in five workers had to keep her schedule free for "call-in" shifts that rarely ma-

terialized. An employee at Club Monaco told researchers that if sales weren't high enough, managers would give workers a single guaranteed shift each week—plus four on-call shifts. A third of the employees in the study had dependent children and were forced, like Santana, to piece together child care to cover their increasingly erratic working lives.

Most low-wage workers juggle two to three jobs just to get by, said Allen Mayne, director of collective bargaining at R.W.D.S.U., a retail workers' union that helped found the Retail Action Project. But it's almost impossible to get a second job if you've already promised away a claim on each of your waking hours. I asked Mayne whether an employee could get fired for missing a shift that she was given at the last minute. "In a nonunion environment?" he said. "Oh, yeah. Fine. See you."

Labor costs have long been a pressure point in retail, but the impact of data-driven software systems is dramatic. In August 2013, less than two weeks after the teen-fashion chain Forever 21 began using Kronos, hundreds of full-time workers were notified that they'd be switched to part-time and that their health benefits would be terminated. Something similar happened last year at Century 21, the high-fashion retailer in New York to which people make pilgrimages for discount Versace, Kate Spade, and Burberry. I spoke with two saleswomen who had worked at the flagship store near the World Trade Center for a combined forty-four years. They said they had always had consistent and full-time schedules until the chain expanded and implemented a Kronos system. Within the space of a day, Colleen Gibson's regular schedule went up in smoke. She'd been selling watches from seven in the morning to three-thirty in the afternoon to accommodate evening classes, but when that availability was punched in to Kronos, the system no longer recognized her as full-time. Now she was getting no more than twenty-five hours a week, and her shifts were erratic. "They said if you want full hours, you have to say you're flexible," she told me.

Larry Mentzer, Century 21's chief revenue officer, said such problems were rare. "We're a big believer in the Kronos electronic scheduling system," he told me. "We had a few small glitches when we rolled it out, and by a few I mean you could count them on your two hands. But we fixed it and we're very happy with it." Max Bruny, president of U.F.C.W. Local 888, which represents Century 21 workers, told me the problems were more widespread: "With Kronos, they organize it in terms of buckets. They ask for your availability. Say you have one hundred percent availability, they put you in the bucket of thirty-five to forty hours. If you say you can't work weekends, you're put in another bucket, where you get maybe twenty-five to thirty hours. And that was the nightmare. So people who used to get forty hours—because you have restrictions, now you're not." Bruny's union filed several grievances in the first year Kronos was implemented and even filed charges with the National Labor Relations Board. Under pressure from the union, Gibson's manager overrode the Kronos scheduler and gave her back her old hours, and the union ultimately won the right to a fixed forty-hour schedule for anyone with at least ten years' seniority. But most shops where Kronos has been implemented—including Starbucks and the Gap—are not unionized, which makes it far more difficult for employees to push back. "We took a different path from other stores," Mentzer said, "because we chose to retain our workforce."

Lisa Disselkamp, a consultant with Deloitte, is the author of three manuals on workforce-management technology. "I think it's natural that it will start to change behaviors," she said of the scheduling software. "It focuses people on a metric. And there's a fear, right? I need to make that number. But if you meet that number, and only that number, what does it cost?"

Kronos's promotional videos emphasize the risk of time theft by employees—"In a few minutes late? Taking a few extra minutes on a break? It adds up"—and some of the firm's most invasive systems, which require employees to clock in with

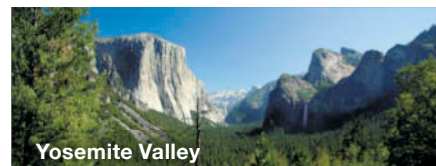a finger scan, are meant to prevent "buddy punching," when an employee clocks in a co-worker who hasn't yet arrived.

John Durkalski, an attorney who has represented union workers with wage and schedule complaints against Kroger, Safeway, and Supervalu, said that time theft by employees is far less common than wage theft by employers. "Store managers change time sheets, lop off overtime, tell people to clock out and keep working, and fine, if you don't, you'll be on the manager's bad side," he told me. If the software subtracts thirty minutes for an unpaid meal break regardless of whether a worker took one or not, or fails to properly account for paid sick leave, it can be extremely difficult for an employee to detect. The scheduling systems also increase the pressure on supervisors to break the rules, Durkalski said. "That pressure is that buzzer that goes, 'Ding, ding, ding, ding, ding, you've hit your costs!' If you hit your costs on the twenty-first day of the month and you've got nine days left, what are you going to do? The pressure is to cook the books or get the employees to work off the clock." In industries where workers typically work three- or four-hour shifts, he said, "if you can get everyone to work fifteen minutes off the clock, you're gaining almost a whole shift! Over the course of the week that will really keep costs down."

Last March, workers filed class-action lawsuits against McDonald's stores in California, Michigan, and New York, alleging systematic wage theft. Some of the practices listed in the legal complaints are closely linked to the stores' in-house data-collection systems. The software itself was not telling managers to violate the law, said David Dean, the lead attorney in the Michigan suit. But every fifteen minutes, the software calculates labor costs as a percentage of revenue—the "labor number"—and reports whether you're under or over your target. "The violations result from managers being told, 'You have to get your labor costs under control: you're over, you're over,'" he said. "The problem is, if they send somebody home and

business picks up in a half hour, they're screwed." According to the plaintiffs, McDonald's managers would routinely tell employees to clock out and wait in the break room for minutes or hours without pay, until revenue picked up enough for the workers to clock back in. Or managers would tell employees to clock out before the end of their shifts but insist they finish certain tasks before going home. (A company spokesperson told me, "When McDonald's learns of pay concerns in restaurants which we own and operate, we review the concerns and take appropriate action to resolve them.... [W]e caution against drawing broad conclusions based on a small number of lawsuits.")

Though the plaintiffs in the McDonald's cases are not talking to the press, Larika Harris, a McDonald's employee who lives in Memphis, Tennessee, described a similar work experience. Harris was typically assigned to the overnight shift, when there's just one person at the window and one person on the grill. "We couldn't take breaks," she said, not even to run to the bathroom, "but the breaks got put in." She was often paid only for her official eight-hour shift, even when her supervisor didn't let her leave on time. If she was scheduled for seven in the evening to three in the morning, she was rarely out of the door till three-thirty; on her eight-to-four overnight shifts, she was usually not allowed to leave until five-thirty. One paycheck, she said, was missing eleven hours of compensation. With an infant and a toddler at home, she had to pay her babysitter for those extra hours even though McDonald's wasn't paying her.

"You're told to 'manage the labor,'" said Kwanza Brooks, a former shift manager who worked at several McDonald's restaurants in Baltimore and in Charlotte, North Carolina, over twelve years. "Your labor, that's what McDonald's calls it, is your main focus." Managers are supposed to give out unpaid thirty-minute breaks, Brooks said, but the staffing is too lean to make that possible. After she'd been at McDonald's about five years, an assistant manager showed Brooks

how he fixed that problem. He noticed that her labor number for one shift was high, 23 or 24, rather than 17 or 18. So he said to go in and manually add in breaks, and showed her how to scroll down the list of employees and add "break in" and "break out" times for each one. When one employee challenged the practice and started asking for a printout of her hours at the end of each shift, Brooks was instructed not to release any more printouts.

I asked Brooks about other methods managers used to hit their numbers. "Say you're supposed to come in at four o'clock and you get there early. They might tell you to help but not clock in. Or they might clock you out on a break but keep you working. Or they might say, 'I'll send you home,' and then there's a rush, and they're going to make sure you help get those customers out whether you are on the clock or not." Managers, she said, "might have half the people working for free." They don't just want a low labor number, she said, "they want their number to be the lowest and best in their area." A 2014 survey of fast-food workers by Hart Research found that 89 percent said they had been victims of some form of wage theft.

J ohn Aiello of Rutgers University is a veteran of the small academic community that researches the electronic monitoring of workers. He started studying call-center workers in the early 1990s, after numbers began to appear at the bottom of their screens to count how many seconds they'd been on the line, along with the call-time quotas they had to meet. Aiello asked the workers, "How do you cheat to get to your goals?" He learned that many of them would hang up whenever a call got too long; the computer couldn't tell whether they'd ended the call or the customer had. Aiello was interested in the potential productivity gains of monitoring, as well as the workarounds it inspired—like the seat-belt-avoidance techniques at UPS. He also wondered whether it increased stress. "In virtually every study it was the case that people felt greater stress in a monitored environ-

ment than not," he said. "And the more closely they were monitored, the greater the stress." As far back as 1990, a major study by the Communications Workers of America found that electronic performance monitoring was associated with anxiety, depression, anger, severe fatigue, headaches, and musculoskeletal injuries.

Another effect was the evaporation of collegiality. "If you monitor someone very closely, and previously they had the feeling that you trusted them, they may no longer have that feeling," he said. Managers who were once able to supervise employee performance in a way that was perceived as positive "now spend half their time monitoring." Aiello also found that if a task being monitored was difficult or complex—such as, say, a UPS driver navigating heavily trafficked streets—employees "actually show, under monitoring, impairment of performance, because a bit of their attention is diverted to the fact that someone is watching them." Finally, Aiello's studies suggest that electronic monitoring is often associated with work speedup. Once employers have metrics, managers use them to increase the goals—and they keep doing so even after the increases become unrealistic.

Aiello's most recent research focuses on telecommuters. There are some 3 million Americans who telecommute full-time, and a far larger number who work remotely one or two days a week. Usually, Aiello said, a company computer is sent home with the teleworker, and supervisors "have the opportunity to look in on it anytime they want." He said companies typically use monitoring software at least part of the time, simply because they can. "There are no federal laws that govern this," he pointed out. "The organization can pretty much do whatever it wants." Studies show that people tend to work more hours at home than when they're in the office, he said, but watching their employees work gives managers "a sense of security."

This sense of security is one of the features on offer at oDesk, which merged with Elance last year to form the world's largest online

freelance marketplace. The site links 9.7 million freelance computer programmers, marketers, graphic designers, copywriters, and translators with 3.8 million businesses looking for part-time employees. According to a September survey commissioned by Elance-oDesk and the Freelancers Union, 53 million American workers, a third of the U.S. workforce, are now engaged in contract, temporary, or freelance work. Gary Swart, the former CEO of oDesk, calls the company part of a "profound revolution in the workplace" resulting from the rise of outsourcing and remote work. "In this economy, buyers are looking for more cost-effective ways to get things done," Swart said in 2010. "They have to do more with less." That year, he said, while hiring at American companies was stagnant, oDesk job postings nearly quintupled; the firm's freelancers earned $900 million in 2014.

The signature feature of oDesk is what it calls the Work Diary. If you, as a freelancer, agree to work hourly—as opposed to on a project basis—and to have your hours tracked in the Work Diary, oDesk will guarantee payment. "It's really about building trust on both sides," Rich Pearson, a senior vice president at oDesk, told me. For workers scraping by on irregular freelance income, who can spend months trying to collect on an invoice, oDesk's guarantee is well worth the 10 percent fee it costs to use the site. But to get that guarantee, you must allow the company deep inside your personal computer.

Pearson described the Work Diary as "the equivalent of being able to walk up to someone's desk and see how they're doing." But it is much more than that. Once every ten minutes while you're logged in, the program takes a snapshot of your computer's desktop. It's a detailed image that shows, for example, all the tabs open on your Web browser. The program also records minute-by-minute keystroke and mouse data, along with a productivity rating. The exact timing of the snapshot is unpredictable. It could happen at the moment you open iTunes to

start a new playlist. Or when your boyfriend sends you an instant message. An icon pops up on your screen whenever a screenshot is captured, and you can review them and delete any troubling images. "The application is *not* a surveillance system," oDesk's online Help Center says. "You have *full control* over what it records … deleting those [screenshots] you choose not to share with your client." But the Help Center fails to note that for each screenshot you delete, you sacrifice ten minutes of guaranteed pay.

I spoke to a few high-volume oDesk freelancers to find out what it was like to work inside what looks, indeed, like a surveillance system. A man I'll call Sean Nolan, a graphic designer and illustrator based in upstate New York, has been freelancing for nine years, his entire working life. (He asked that I not use his real name for this article.) Over the past year oDesk has become the primary way he finds clients. He got his B.F.A. at a small art school in Virginia and said he's told all his classmates about oDesk because he loves it so much. But he described the Work Diary as "something akin to the devil."

"Being a creative, so much of my work is not in front of the computer," he said. "So I had a really tough time getting used to it. It feels like someone is always looking over your shoulder. You can't really produce good work that way. Part of my mind is worried about how people are going to perceive the work I'm doing. A lot of the work I'm doing is messy; it's not client-ready, and knowing that someone's watching the process, it's harder to take risks." He also misses taking his sketchbook out to the park for inspiration.

When Nolan goes to the bathroom or to get a cup of coffee, he said, he gets an inactivity alert. The same happens whenever he does work in the nondigital world, like taking a moment to leaf through a book of photographs. Nolan said that "oDesk makes the business aspect incredibly easy. But you lose all of the freedom that comes with being a work-at-home, self-employed freelance artist." He said he tries to move his clients

over to project-based fees as soon as possible, to escape the Work Diary's watchful eye.

The Work Diary poses a real risk of wage theft too. If no screenshot is taken, you don't get credit for that work increment. "This isn't a problem on a small scale," he said, "but over the course of a week it can be a big problem. If I do a five-minute fix for six different clients, then I'm not getting paid for a half hour of work." If Nolan thinks something's going to take only five minutes, he often won't bother logging in. And then it takes fifteen. Last summer he kept a stopwatch on his desk to see how many hours he was really working— mainly on oDesk jobs—versus how many he was billing. By week's end there was a ten-hour gap.

I decided to try oDesk myself and posted that I needed some transcription work for this article. Within a day, I got several responses, from freelancers in India, Serbia, Saint Lucia, the Philippines, and throughout the United States. I hired a woman from Texas with a five-star rating, who had logged 1,300 hours of oDesk work. We had a quick email exchange about the deadline and her rate before I uploaded several audio files to Dropbox.

Then I began to spy on her.

The first time I opened her Work Diary, it was empty. But the following evening, sitting in bed with my laptop, I opened it again, and there it was: a series of eight screenshots, snapped between 8:41 and 10:12 P.M. As I clicked on each image, it filled my screen. I could watch the transcription unfold, from a few lines to a full page and beyond. For each screenshot, her activity level was rated by a green bar on a scale of one to ten. She had almost all tens.

I was reminded, uncomfortably, of a not very proud night some years ago when I clicked through the open email account of a boyfriend I suspected of cheating. Now I clicked on the Work Diary's green bar, which showed me my transcriber's keyboard strokes and mouse clicks in one-minute increments: from 8:42 to 8:43, 256 keystrokes, no mouse clicks. 8:43 to 8:44, 226 keystrokes. 8:44 to 8:45,

264 keystrokes. It was eerie. I could see her desktop background, I could see the transcription program with its volume setting, I could see the open Word document, and I could see a list of her other oDesk clients. I was pricked by feelings of guilt, but monitoring her became addictive. For the next few days, until she finished the job, I'd find myself pulling up the Work Diary every few hours.

In academic papers about big data and electronic monitoring, Michel Foucault's metaphor of the panopticon, from *Discipline and Punish*, often comes up, and I thought of it again here. "He is seen, but does not see; he is the object of information, never a subject in communication." My transcriber, like the inmate in the panopticon, was potentially observable at all times. I suppose that put me in the position of the prison guard.

After the job was done and I'd closed the account, I emailed the transcriber to ask her about oDesk. Katrina—she asked that I use only her first name—used to work in retail, but she moved around a lot because her husband was a defense contractor. She had trained as a transcriber so that she wouldn't have to quit her job every time they moved. When I asked about the Work Diary, whether she found the experience of being so minutely observed strange, she shrugged it off. "I don't have a problem with it whatsoever," she said, "because I don't have anything to hide."

But as we spoke it became clear why she had nothing to hide, and why her activity meter almost always posted a ten: any work that scored low on the metrics she simply did off the clock. Katrina said that when you log in to the Work Diary, the first screenshot is always taken before a full ten minutes have elapsed, so the activity meter associated with that slot registers lower productivity. "I always delete that," she said. This means that every time she sits down to work—and with four kids at home, she usually works in short increments—she starts by sacrificing as many as nine minutes of pay.

Whenever Katrina finishes a transcript, she proofreads it without logging in to oDesk. She figures that when she's proofing, her keyboard activity is so minimal the tracker would probably log her out for inactivity anyway. So she typically takes four hours to transcribe an hour of audio, which she does on the clock, and about an hour and ten minutes to proofread it, which she does on her own time. She says that while her $15-an-hour rate doesn't compensate her for off-the-clock hours, "it saves any misunderstandings, which is important." It also keeps her competitive with freelancers from Pakistan and the Philippines who are ready to work for less than minimum wage.

"It's an optional program," oDesk's Rich Pearson says about the Work Diary, which is true: freelancers can opt for manual time sheets if they're willing to work for a stranger halfway around the world with no guarantee that they'll be paid. Technically, Katrina volunteered to be surveilled, and then, to optimize her metrics, she chose to steal her own time.

She said that oDesk recently selected her as an "all-star" freelancer.

"The current mythology of big data," according to Kate Crawford, who holds research positions at MIT, NYU, and Microsoft, "is that with more data comes greater accuracy and truth." Big data in the workplace holds out the promise of true equality of opportunity, in which *Moneyball*-style analytics unearth hidden talent. Yet Kronos's metrics-based hiring software is currently under investigation by the Equal Employment Opportunity Commission for discriminating against people with disabilities. Even the knowledge-sharing metrics used by companies like Cornerstone to assess elite knowledge workers may reproduce inequity. As Marc Smith, the sociologist from the Social Media Research Foundation, pointed out, "The diversity of your connections is a proxy for your wealth." In other words, firms that reward their optimally networked employees risk further increasing inequality.

But these systems are still new; their biases may not be locked in yet. Susan Lambert, the retail-industry researcher, told me that the most sophisticated software-scheduling systems have the capacity to reduce, rather than exacerbate, volatility in the lives of retail workers. These systems use elaborate regression equations that predict sales volume for any hour of the day on any day of the year, as well as how much staffing will be required. Store managers often get those numbers several days before the start of the month, she said, yet they're often afraid to fully assign the hours because they might get adjustments from their regional manager based on actual foot traffic. To play it safe, managers keep workers on call, send workers home the moment there's a lull, or wait till the last moment to announce their employees' schedules.

Lambert's most recent study involves a national chain of women's clothing stores that gave her complete access to payroll data for eighty stores. When her team looked at the adjustments made to the initial labor allocations, they were minuscule—two to three staff hours per store per week. The algorithms, they discovered, were predicting labor needs with 90 percent accuracy, yet that 10 percent variation was driving enormous instability in workers' lives. "We're trying to say, 'Just look at those original predictions,'" she said.

As Zeynep Ton wrote in the *Harvard Business Review*, companies such as Costco and Trader Joe's that invest in higher pay, more training, and more convenient schedules bring in far more revenue per employee than competitors that do not. Both companies are Kronos clients. Charles DeWitt, the Kronos executive, said that retailers are better served when they see employees as potential profit centers, and not just as "a big bucket of costs" to be cut. Still, the dominant paradigm remains what Lisa Disselkamp, the Deloitte consultant, calls "the highly optimized system," one organized around minimizing labor costs. Perhaps you can't manage what you can't measure. But the measuring has taken on a life of its own. ∎