WHEN TIMEKEEPING SOFTWARE UNDERMINES COMPLIANCE

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ABSTRACT

Electronic timekeeping is a ubiquitous feature of the modern workplace. Time and attendance software enables employers to record employees' hours worked, breaks taken, and related data to determine compensation. Sometimes this software also undermines wage and hour law, allowing bad actor employers more readily to manipulate employee time cards, set up automatic default rules that shave hours from employees' paychecks, and disguise edits to records of wages and hours. Software could enable transparency, but when it serves to obfuscate instead, it misses an opportunity to reduce costly legal risk for employers and protect employee rights. This article examines thirteen commonly used timekeeping programs to expose the ways in which software innovation can erode compliance. Drawing on insights from the field of behavioral compliance, we explain how the software presents subtle situational cues that can encourage and legitimize wage theft. We also examine gaps in the Fair Labor Standards Act's recordkeeping rules – unchanged since the 1980s – that have created a regulatory vacuum in which timekeeping software has developed. Finally, we propose a series of reforms to those recordkeeping requirements that would better regulate timekeeping data and software systems and encourage wage and hour law compliance across workplaces.

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I.   INTRODUCTION

Electronic timekeeping is a ubiquitous feature of the modern workplace.[1] In place of the old punch-card time clock, employees now log onto a computer or mobile device, swipe a radio frequency identification (RFID) badge, scan a fingerprint, or gaze into an iris recognition device.[2] These and similar systems

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[1]   *2015 Getting Paid in America Survey*, AMERICAN PAYROLL ASSOCIATION, http://www.nationalpayrollweek.com/documents/NPW2015SurveyResults.pdf [http://perma.cc/VNS7-M8KE] (of surveyed employees required to report their hours, 52% did so through a PC, 22% via a badge/card reader, 4% using a PDA, tablet or smartphone, and 9% using biometric scan).

[2]   *See, e.g.*, *Over 50,000 Companies Trust Easy Clocking's Time and Attendance Systems*, EASY CLOCKING, http://easyclocking.com/ [https://perma.cc/VK5M-MHJN](last visited Sept. 2, 2016) ("Choose from our wide array of fingerprint, smart card, pin entry, PC or mobile employee time clocks"); *Iris*

enable employers easily to record employees' hours worked, breaks taken, and other information used to determine compensation. Yet they can also enable employers to deprive employees of earned pay by editing down their hours worked, setting up automatic default rules that shave time, and disguising edits to employees' time records. These actions potentially violate the federal Fair Labor Standards Act (FLSA) and its state and local counterparts.[3] Some software thus creates the means and opportunity for wage theft; without the proper oversight, supervisors driven to minimize labor expenditures in tight budgetary environments supply the cost-cutting motive.[4]

In doing so, supervisors work at cross purposes with the long-term interests of their employer,[5] which is then exposed to the risk of expensive wage and hour litigation. This risk grows the longer the wage theft goes undetected and the more widespread those practices become. Like the recent Wells Fargo scandal, where the company faced enormous fines and bad publicity after a tiny fraction of its employees opened unauthorized accounts for customers,[6] wage theft by a small number of supervisors has

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Recognition Employee Time Clock, EASY CLOCKING http://easyclocking.com/iris-recognition-employee-time-clock.html [https://perma.cc/6ZSA-KDWW] (last visited Sept. 2, 2016) (describing login based on "iris recognition"); *Using Biometrics in the Workplace*, FISHER PHILLIPS, http://www.fisherphillips.com/resources-newsletters-article-using-biometrics-in-the-workplace [https://perma.cc/3526-9MA4] (last visited Sept. 2, 2016) (describing hand scanners as a form of biometric time clock); *Biometric Access Control*, HUMANITY, http://www.humanity.com/biometric-access-control/ [https://perma.cc/SA9F-77FQ] (last visited Sept. 2, 2016) (describing "a feature called FacePunch which uses advanced facial recognition technology").

[3] *See* Part II *infra*, discussing the Fair Labor Standards Act and other wage and hour laws.

[4] *See, e.g.*, Steven Greenhouse, *A Part-Time Life, As Hours Shrink and Shift*, N.Y. TIMES (Oct. 27, 2012) (discussing pressure on supervisors to manage overtime costs by changing workers' schedules); Steven Greenhouse, *A Push to Give Steadier Shifts to Part-Timers*, N.Y. TIMES, (July 15, 2014) (same); HARRIET PRESSER, WORKING IN A 24/7 ECONOMY (2005) (same).

[5] As Elizabeth Umphress, Joanna Tochman Campbell, and John Bingham explain, an employee may act with the intention of benefitting his/her employer (for example, by shredding incriminating documents), even though those actions are inconsistent with the employer's ultimate interests. *Paved with Good Intentions: Unethical Behavior Conducted to Benefit the Organization, Coworkers, and Customers in* MANAGERIAL ETHICS 127 (Marshall Schminke ed., 2010).

[6] Consumer Financial Protection Bureau, *Consumer Financial Protection Bureau Fines Wells Fargo $100 Million for Widespread Illegal Practice of Secretly Opening Unauthorized Accounts*, http://www.consumerfinance.gov/about-us/newsroom/consumer-financial-protection-bureau-fines-wells-fargo-100-million-widespread-illegal-practice-secretly-opening-unauthorized-accounts/ [https://perma.cc/Z95M-DNR8] (September 8, 2016). Wells Fargo fired approximately 5,300 employees in connection with the fraud, which represented less than 2% of its 268,000

the potential to balloon into substantial liability and extensive litigation. An employer caught with questionable records is poorly positioned to defend wage and hour litigation because a court may declare those records "inaccurate" under a 1946 Supreme Court case, *Anderson v. Mt. Clemens Pottery Co.*[7] Under *Mt. Clemens*, the court may permit employees to introduce testimonial evidence of their hours worked or rely on representative evidence from a subset of plaintiffs.[8] An "inaccurate" determination also makes courts more likely to impose liquidated damages.[9] We posit that the litigation risk

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employees. Wells Fargo Today – Quarterly Fact Sheet (2d Quarter 2016), https://www08.wellsfargomedia.com/assets/pdf/about/corporate/wells-fargo-today.pdf [https://perma.cc/3P87-XY2R]; *Wells Fargo Workers Claim Retaliation for Playing By the Rules*, N.Y. TIMES, http://www.nytimes.com/2016/09/27/business/dealbook/wells-fargo-workers-claim-retaliation-for-playing-by-the-rules.html [https://perma.cc/QY7F-EMW2] (Sept. 26, 2016) (5,300 employees fired for ethics violations); *"You Should Resign": Watch Sen. Elizabeth Warren Grill Wells Fargo CEO John Stumpf*, http://www.npr.org/sections/thetwo-way/2016/09/20/494738797/you-should-resign-watch-sen-elizabeth-warren-grill-wells-fargo-ceo-john-stumpf [https://perma.cc/U7CH-FZAM] (Sept. 20, 2016).

7   328 U.S. 680 (1946). Under *Mt. Clemens*, if the plaintiff/employees succeed in proving that the entire corpus of timekeeping records are "inaccurate or inadequate," the plaintiffs benefit from a presumption that permits them to proffer favorable testimonial evidence. *Id.* at 680. This presumption allows plaintiffs to prove their compensable time "as a matter of just and reasonable inference." *Id.* This lowers the quantum of proof required of employees and permits them to introduce testimony regarding their recollection of their hours worked and to rely on representative evidence taken from a subset of plaintiffs to establish hours worked across a larger class. Doo Nam Yang v. ACBL Corp., 427 F. Supp. 2d 327, 335 (S.D.N.Y. 2005) ("it is possible for plaintiff to meet this burden by relying on his recollection alone."); Reich v. Cole Enters., Inc., 901 F. Supp. 255, 260 (S.D. Ohio 1993) ("[s]ince the company did not keep records of actual hours worked, the Court may look to employee testimony to determine the amount of unpaid time worked per day"). *See also* Tyson Foods, Inc. v. Bouaphakeo, 577 U.S. ___ (2016). A ruling can also be based on expert or investigator estimates of the amount of unrecorded work. *Reich*, 901 F. Supp. at 261 (relying on computations by the DOL investigator). Employers are then precluded "from using time records to rebut the employees' proof of back pay." Solis v. Supporting Hands, 2013 WL 1897822, at * 23. Courts have been generally unsympathetic to arguments that a plaintiff's testimony about the number of hours worked is self-serving and speculative, admonishing employers that the failure of proof is their own fault for failure to keep better records. Dominguez v. Quigley's Irish Pub, Inc., 790 F. Supp.2d 803, 812-13 (N.D. Ill. 2011); Monroe v. FTS USA, LLC, 763 F. Supp. 2d 979, 989 (W.D. Tenn. 2011).

8   *Mt. Clemens*, 328 U.S. at 680.

9   However, non-compliance with record keeping is often treated as evidence that the employer's failure to pay wages was "willful." *See, e.g.*, Porcal v. Ciuffo, No. 10-cv-40016-TSH, 2013 WL 3989668, at *5 (D. Mass. Aug. 1, 2013) (holding failure to maintain accurate records deemed as evidence of willfulness); Pineda v. Masonry Constr., Inc., 831 F. Supp. 2d 666, 674 (S.D.N.Y. 2011); *Monroe*, 763 F. Supp.2d at 991-92 (holding that adjusting employee timecards to eliminate overtime pay was evidence of willfulness to support liquidated damages award); *Doo Nam Yang*, 427 F. Supp.2d at 335

arising from software use (or misuse) may be underestimated or overlooked by employers, who pay little heed to the type of software they are using or the behavioral cues it presents to the user.

In the rush to identify algorithmic methods for finding violations of the FLSA and related wage and hour laws, the government's focus has been on employer data, not on time keeping software that generates the data.[10] We posit that there needs to be greater attention paid to the software that produces the data and the behaviors and incentives of the individuals making and using the software. This article thus considers electronic timekeeping systems through the lens of behavioral compliance, a field that has emerged from the study of behavioral economics,[11] ethics,[12] and organizational and

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(S.D.N.Y. 2005) (holding failure to keep records as evidence of willfulness). "Willful" violations of the FLSA are subject to liquidated damages and a longer statute of limitations. McLaughlin v. Richland Shoe Co., 486 U.S. 128 (1988); *Monroe*, 763 F. Supp. 2d at 992 (evidence "that supervisors adjusted hours recorded by technicians to eliminate overtime pay" supported "willful" determination, which extends statute of limitations of 3 years instead of two).

[10] For example, the U.S. Equal Employment Opportunity Commission (EEOC) has recently proposed new rules that would require employers to report their employees' earnings by job category, sex, race, and ethnicity in aggregated pay bands, in order for the agency to assess possible pay discrimination. *See Questions and Answers, Notice of Proposed Changes to the EEO-1 to Collect Pay Data from Certain Employers*, U.S. EQUAL EMPLOYMENT OPPORTUNITY COMM'N (last visited Sept. 18, 2016), https://www.eeoc.gov/employers/eeo1survey/2016_eeo-1_proposed_changes_qa.cfm [https://perma.cc/5QAQ-9TLG]. As we explain further in Part VI below, we recommend that the U.S. Department of Labor amend and update its recordkeeping regulations to target employers' timekeeping practices and procedures, not necessarily that the agency demand additional pay data from employers—which are the outputs from timekeeping systems. In this sense, this article's process-focused proposal differs from the EEOC's outputs-based proposed reporting rules.

[11] *See* Christine Jolls, Cass Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1474 (1998) ("behavioral economics allow us to model and predict behavioral relevant to law with the tools of traditional economic analysis, but with more accurate assumptions about human behavior, and more accurate predictions and prescriptions about law."); *see also* Yuval Feldman*, Behavioral Ethics Meets Behavioral Law and Economics*, THE OXFORD HANDBOOK OF BEHAVIORAL ECONOMICS AND THE LAW 225-226 (2014) ("the common theme in the literature on [behavioral ethics] is that unethical behaviors are not the product of explicit choices to do wrong but rather are largely the product of . . . mindless choice . . . . Another common theme . . . is the need to protect our self-image to resolve the dissonance between believing that we are good people are our desire to maximize self-interest.").

[12] Arthur Brief, *The Good, the Bad and the Ugly in* BEHAVIORAL BUSINESS ETHICS (De Cremer & Tenbrunsel eds., 2012) ("'Behavioral ethics' entails the social scientific study of ethical behavior.'); David D. Cremer & Ann Tenbrunsel, *On Understanding the Need for a Behavioral Business Ethics Approach* 4-5 in BEHAVIORAL BUSINESS ETHICS (De Cremer & Tenbrunsel eds.,

managerial behavior.[13] Behavioral compliance is concerned with people's decision-making and motivations around "cheating" – a term of art referring to unethical behavior, where illegal conduct represents "an especially troubling form of cheating."[14] Deploying a behavioral compliance framework, we are the first authors to examine thirteen commonly used timekeeping programs and catalog the ways in which such programs enable or discourage cheating behavior.

We also develop a critical typology for understanding and ultimately regulating this space: Category A software tends to include facially neutral features that can be used for either legitimate or illegitimate purposes. For example, a software feature designed to allow supervisors to edit an employee's time entry could be used lawfully to correct an employee's mistake, or unlawfully to reduce an employee's time worked to avoid overtime. Category B software includes none of these dual-use features, and instead actively minimizes supervisors' opportunities to cheat. In this sense, Category B programs resemble what Jonathan Zittrain and others have called a "trusted system," which limits the ability of an untrusted party to engage in unauthorized conduct.[15] Category B software, for

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2012) ("the behavioral approach…explicitly argues that much unethical behavior occurs outside the awareness of individual actors . . . [and] is supported by recent research on morality, intuition and affect"; "some contexts may be sufficiently compelling for almost anyone to engage in unethical behavior. Arriving at a more complete understanding of these circumstances should enable leaders to create organizations that are more ethical.").

[13] Donald C. Langevoort, *Behavioral Ethics, Behavioral Compliance 2 in* JENNIFER ARLEN, ED. RESEARCH HANDBOOK ON CORPORATE CRIME AND FINANCIAL MISDEALING (forthcoming) ("The label 'behavioral compliance' can be attached to the design and management of compliance that draws from this wider range of behavioral predictions about individual and organizational behavior.").

[14] Langevoort, *supra* note 13 ("Research in behavioral ethics uses 'cheating' as its key word to describe what good ethics is not, and treats illegal behavior as an especially troubling form of cheating.").

[15] This represents somewhat of an imprecise use of the phrase "trusted system" which relates to "adding several hardware components to computers to create greater security for encryption, storage and software." Ryan Roemer, *Trusted Computing, Digital Rights Management, and the Fight for Copyright Control on Your Computer*, 2003 UCLA JOURNAL OF LAW & TECH. 8 (2003). The concept was subsequently imported into discussions of digital rights management to prevent copyright infringement. *See, e.g.*, Mark Stefik, *Trusted Systems*, SCIENTIFIC AMERICAN 78, 79 (March 1997) (trusted systems consist of "techniques that render a system trustworthy"); Mark Gimbel, *Some Thoughts on the Implications of Trusted Systems for Intellectual Property Law*, 50 STAN. L. REV. 1671, 1672 (1998) ("Many different types of trusted systems are possible: trusted players, for playing audio or video works; trusted servers, for distributing works over the Internet; even trusted printers, for printing protected documents."). Jonathan Zittrain offers a more

example, does not permit supervisors to edit employees' time entries directly. Instead, supervisors may accept or reject an employee's time entry, but only the employee has the power to change the time entered.[16] The differences in the two categories' architecture is significant from a behavioral compliance perspective: the forced interaction between manager and employee in Category B acts as a form of real-time mutual surveillance, whereby both parties hold each other to their compliance obligations.[17] By contrast, Category A software can disguise and legitimize noncompliant acts, leaving any discovery and correction of managers' cheating – if it even occurs – until long after the fact.

The differences between the timekeeping software in Categories A and B can be traced back to the two different regulatory regimes that govern electronic timekeeping: the U.S. Department of Labor's (DOL) recordkeeping regulations, which were enacted pursuant to the FLSA,[18] and U.S. Department of Defense audit guidelines, which are described in the department's Defense Contract Audit Agency (DCAA) Manual. The DOL guidelines apply broadly to all employers covered by the FLSA; the DCAA guidelines apply only to those employers who contract with the federal government. The DOL regulations have not been updated since the 1980s, assume paper-based records, and pay little attention to the possibility of supervisor edits to workers' underlying time records.[19] The FLSA's recordkeeping rules are further marginalized because they cannot be enforced through a private cause of action, although violations are sometimes treated as evidence of an employer's

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adaptive definition of the term: "[t]rusted systems are systems that can be trusted by outsiders against the people who use them." Jonathan Zittrain, *The Generative Internet*, 119 HARVARD LAW REVIEW, 1974, 1998 (2006); *see also* Jonathan Zittrain, *What the Publisher Can Teach the Patient: Intellectual Property and Privacy in an Era of Trusted Systems*, 52 STANFORD L. REV. 1201 (2000) ("A trusted system is one that can be trusted by a rights-holder as against the user of the system- even if the physical system is in the custody of the user.").

[16] A third type of software, Category A/B, consists of software whose default functionality is characteristic of Category A (susceptible to both legitimate and illegitimate uses), but the software maker also offers Category B features as a (little known) alternative configuration. For more details, see *infra* note 75.

[17] Langevoort *supra* note 13 at 16-18 (discussing surveillance) and 15-16 (discussing the importance of minimizing the lag time between discovered cheating and interventions).

[18] As discussed further in Part II *infra*, some states have their own wage and hour recordkeeping regulations. State-level laws vary in their rigor and applicability across employers.

[19] *See infra* Section V.A.

willful non-compliance with substantive rules.[20] Moreover, many employers view the larger ecosystem of wage and hour laws within which recordkeeping rules are situated as outdated and onerous.[21] Category A timekeeping software resides primarily within this loose regulatory structure.

By contrast, the DCAA guidelines scrutinize an employer's processes for ensuring the integrity of workers' time records.[22] The DCAA Manual advises against allowing supervisors to edit employee timecards if those supervisors are also responsible for meeting budgets, [23] presumably because the situation creates strong incentives to edit employee time downward. The audit guidelines' clear focus on process integrity[24] created demand for Category B timekeeping software that limits opportunities for cheating. Recordkeeping transgressions—and in particular, knowing alterations to records—are viewed as a fraud on the government, and can trigger sanctions ranging from contract cancellation to criminal penalties.[25] We posit that the contrast between the two categories of timekeeping software – and the potential of Category A software to enable law breaking by bad-

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[20] The record keeping regulations can only be enforced by the Department of Labor. 29 U.S.C. § 216(b); *see also* Arencibia v. 2401 Restaurant Corp., 831 F. Supp.2d 164, 180 (D.D.C. 2011); East v. Bullock's Inc., 34 F. Supp.2d 1176, 1182 (D. Ariz. 1998). However, non-compliance with record keeping is often treated as evidence that the employer's failure to pay wages was "willful." *See supra* note 9.

[21] *See, e.g.*, *The Fair Labor Standards Act: Is it Meeting the Needs of the Twenty-First Century Workplace?: Hearing Before the Subcomm. on Workforce Protections, Comm. on Education and the Workforce*, 112th Cong. 21 (2001) (Statement of Richard L. Alfred, Partner, Seyfarth Shaw, LLP) ("The Fair Labor Standards Act is an anachronism in today's economy. This has led to an explosion of litigation over the past decade that has imposed enormous— in some cases catastrophic—burdens on employers.").

[22] DEP'T OF DEF., DEF. CONTRACT AUDIT AGENCY, DCAA CONTRACT AUDIT MANUAL 5-909 (2016) [hereinafter "DCAA Manual" or the "Manual"] ("The contractor should have procedures to assure that labor hours are accurately recorded and that any corrections to timekeeping records are documented, including appropriate authorizations and approvals. When evaluating the contractor's timekeeping procedures, the auditor should consider whether the procedures are adequate to maintain the integrity of the Timekeeping System.").

[23] *Id*. at 5-907.f ("supervisors who are accountable for meeting contract budgets should not have the opportunity to initiate or change employee time charges").

[24] *Id*. at 5-909, 5-902 ("To assess control risk on the labor system as low and reduce substantive testing, the contractor's system should have: An effective method to monitor the overall integrity of the Labor/Timekeeping System"), 5-904 ("The purpose of the audit is to evaluate the adequacy of and the contractor's compliance with the labor system's internal controls"), 5-905 ("In many instances, control activities may be embedded in the contractor's IT system").

[25] *See infra* Section V.B.

actors – signals a problem with the DOL's record keeping regulations.

The article thus proceeds as follows. In Part II, we provide a brief overview of relevant wage and hour laws. This serves as the necessary backdrop for understanding the respects in which Category A software undermines wage and hour protections. Part III describes the methodology used to collect the electronic timekeeping software data examined here. Part IV illustrates the architecture and features of Category A and B timekeeping software, and explores how Category A can undermine wage and hour law. Part IV also applies social science research to Category B software, and argues that such software limits cheating by requiring more overt dishonest acts on a supervisor's part to effectuate the cheating. Part V describes the influence of recordkeeping rules on software design, and Part VI offers recommendations to the Department of Labor for amending those rules.

II. AN OVERVIEW OF WAGE AND HOUR LAW

This Part provides a brief summary of aspects of federal and state wage and hour law that are implicated in the functionality of timekeeping software.

The FLSA is the primary federal law that governs workers' wages and hours. Congress enacted the statute in 1938 to protect workers from "substandard wages and oppressive working hours."[26] For the most part, the basic minimum wage and overtime protections provided by the statute remain intact in their original form.[27] It is worth pausing here for effect: the main law regulating work hours and pay for most employees in the United States has remained unchanged since before the Second World War. The FLSA requires covered employers to pay a minimum wage for each hour worked,[28] and an overtime premium for any hour worked over forty in a given week.[29] Some employees are exempt from one or both requirements if they meet certain compensation-based and duty-based requirements set forth in the regulations.[30]

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[26]   S. REP. NO. 75-884 (1937).
[27]   Nantiya Ruan, *Same Law, Different Day: A Survey of the Last Thirty Years of Wage Litigation and its Impact on Low-Wage Workers*, 30 HOFSTRA LAB. & EMP. L. J. 355, 357 (2013).
[28]   29 U.S.C. § 206 (2015).
[29]   29 U.S.C. § 207 (2015).
[30]   The federal regulations defining overtime exemptions are set forth at 29 C.F.R. 541. Employer practices relating to classifying employees as "exempt" or "non-exempt" from overtime are beyond the scope of this project.

Some states and localities have their own wage and hour laws.[31] States and cities may require hourly wages that are higher than the federal minimum,[32] or may apply a lower hourly wage to workers who are exempt from the FLSA.[33] States can establish additional requirements for employees to qualify as exempt. They can also impose additional rules regarding unpaid break and leave time, maximum hours, pay stubs, and other aspects of wage and hour law.[34]

The use, misuse, and functionality of timekeeping software primarily affects employees paid on an hourly basis because their wages are a function of the number of hours worked. Hourly employees represented 58.5% of workers in the United States as of 2015.[35] Many of their employers are covered by the FLSA, which regulates any employer engaged in interstate commerce with two or more employees and annual sales of at least $500,000.[36] Those not covered by the FLSA are frequently covered by state laws, which often cover substantially all employers in the state.[37]

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[31] *See State Labor Laws*, U.S. DEP'T OF LABOR, WAGE AND HOUR DIVISION (last visited Nov. 28, 2016), http://www.dol.gov/whd/state/state.htm [https://perma.cc/FPW5-BEMF].

[32] *California, New York Enact US-Highest $15 Minimum Wages*, ASSOCIATED PRESS (last updated Apr. 5, 2016), http://bigstory.ap.org/article/98cddb672d82427cb910b98c77fd1c4a/california-governor-set-approve-highest-minimum-wage [https://perma.cc/K92W-9SSD].

[33] *Minimum Wage Laws in the States—August 1, 2016,* U.S. DEP'T OF LABOR, WAGE AND HOUR DIVISION (2016), http://www.dol.gov/whd/minwage/america.htm [https://perma.cc/K6YS-YEAR].

[34] *See, e.g.*, Cal. Lab. Code § 226(a) (imposing a requirement regarding itemized wage statements)

[35] U.S. Bureau of Lab. Stat., *Characteristics of Minimum Wage Workers, 2014*, BLS Reports (April 2016), http://www.bls.gov/opub/reports/minimum-wage/2015/home.htm [https://perma.cc/7FV6-MWYJ].

[36] 29 U.S.C. § 203(s) (2015).

[37] GREGORY MCGILLIVARY, WAGE AND HOUR LAWS: A STATE-BY-STATE SURVEY 174, 844 (California law "applies when an employment relationship exists"; Massachusetts minimum wage covers all employers, other wage payment statutes exclude certain occupations); Nev. Rev. Stat. 608.005 (2015) (covering all employers). *Compare* 7 Colo. Code Regs. § 1103-1 (cover retail and service industries, businesses that "provide services to other commercial firms," restaurants and other food service businesses, and health and medical businesses). A few only cover employers not covered by the FLSA. Kan. Stat. Ann. 44-1202 (2016) (covering all employers not covered by the FLSA, except those in the agricultural industry or domestic service); Tex. Lab. Code. Ann. § 62.151 (West 2015). A few states do not have wage laws with broader coverage than the FLSA. *See also* MCGILLIVARY, *supra*, at 4 (Alabama "primarily relies on" the FLSA).

Violations of federal and state wage and hour laws can occur in a variety of ways.[38] Wage and hour violations sometimes involve failing or refusing to pay a non-exempt employee for some or all of her compensable time, a practice colloquially referred to as "wage theft."[39] For example, an employer might force an employee to work "off the clock" by instructing her to begin work before she "punches in" at the start of her shift, or continue working after she "punches out" at the end of the day.[40] If the unpaid hour(s) result in an effective wage rate below minimum wage, the employer violates the FLSA's minimum wage requirement. If the unpaid hour(s) worked were in excess of forty per week, then the employer violates the FLSA's overtime requirement.[41]

Non-payment of wages for all hours worked may also represent a separate state wage and hour violation. For example, state wage rules may require that all earned wages be paid within a certain time, such as semi-monthly.[42] An employer that fails to pay the entirety of the amount owed thus violates

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[38] Many wage violations—such as misclassifying workers as independent contractors or as "exempt" from overtime—do not implicate timekeeping software because the employer typically fails to keep any records of a misclassified employee's hours. Our focus in this project is wage and hour violations involving hourly employees who are eligible for minimum wage and overtime, where there are at least some records of hours worked. These are the employees whose wages are most dependent upon the use, and misuse, of timekeeping software.

[39] *See* Ian Gabriel Nanos, 17 No. 10 N.Y. EMP. L. LETTER 5 (2010) (defining wage theft as "failing to pay minimum wage; failing to pay overtime; requiring off-the-clock work; pilfering tips; and misclassifying workers"); Stephen Lee, *Policing Wage Theft in the Day Labor Market*, 4 U.C. IRVINE L. REV. 655, 661 (2014) (defining wage theft as "nonpayment of wages for work performed"); Todd Palo, *Minimum Wage, Justifiably Unenforced?* 35 SETON HALL LEGIS. J. 36, 40 (2010) (defining wage theft as "when an employer deprives an employee of pay which he or she is due as remuneration for work performed.")

[40] Disputes periodically arise over whether time worked before or after a shift qualifies as "compensable." For example, in *Integrity Staffing Solutions v. Busk*, employees argued unsuccessfully that waiting in an antitheft security screening line was compensable. 135 S.Ct. 513, 516 (2014) (finding such time uncompensable). This article does not focus on such disputes, except insofar as such cases bear upon an employer's record keeping obligations, and the evidentiary consequences of a finding of non-compliance.

[41] *See, e.g.*, Steven Greenhouse, *Wal-Mart to Pay $54 Million to Settle Suit Over Wages*, N.Y. TIMES, (Dec. 9, 2008), http://www.nytimes.com/2008/12/10/business/10walmart.html [https://perma.cc/EG8E-NBDF] (alleging that supervisors instructed employees to "clock out" early to avoid paying overtime; court ruled against employees on routine off-the-clock work).

[42] N.Y. Lab. Law § 191 (McKinney 2016) (dealing with frequency of payments); N.Y. Lab Law § 190 (McKinney 2016) (defining wages as "the earnings of an employee for labor or services rendered"); 1903 Ill. Laws 198-99 § 1; 1913 Ill. Laws 358.

rules regarding timely paychecks.[43] State wage rules may also prohibit deductions from an employee's wages unless they are made for the benefit of the employee, are expressly authorized by the statute, or are authorized by the individual employee in writing.[44] Reducing an employee's hours worked within a timekeeping system, because it ultimately affects the amount paid to the employee, could be considered an impermissible deduction.[45]

Although the FLSA does not require the employer to provide meal and rest breaks, state law may also demand that meal and/or rest breaks be provided to non-exempt employees who work a shift of a certain duration. For example, California law requires that employees receive one unpaid meal period of at least thirty minutes, if the shift exceeds five hours.[46] If the employer fails to provide the meal break, the employer owes the employee compensation both for the time worked, as well as an additional hour of pay.[47] California also requires that employers

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[43] *Id.*

[44] N.Y. Lab. Law § 193 (McKinney 2012); N.Y. COMP. CODES R. & REGS. tit. 12, § 195-2.1 (2016); Illinois Public Act 78-914, 820 Ill. Comp. Stat. 115/9 (2015); Scott Miller, *Combatting Wage Theft in Illinois: Administering and Enforcing the IWPCA*, 47 URB. LAW 665, 693 (2015)

[45] State rules regarding the timeliness of paychecks and deductions from pay are accompanied by civil penalties. N.Y. LAB. LAW § 197 (McKinney 2011); 820 ILL. COMP. STAT. 115/14 (2015). Some states and cities have expressly sought to crack down on wage theft by enacting wage theft prevention statute. 2015 Conn. Acts 15-86 (Reg. Sess.); California Wage Theft Protection Act, 2011 CAL. STAT. Ch. 655; Illinois Wage Payment and Collection Act, 820 ILL. COMP. STAT. 115 (2011), D.C. Wage Theft Prevention Act of 2013; Anti-Wage Theft Ordinance, Chicago, IL 2013. New York's 1997 Unpaid Wages Prohibition Act, for example, imposes criminal penalties for failing to pay employee wages in accordance with state law. N.Y. Lab Law 198-a; Nanos, *supra* note 39 (describing a 2010 New York law that expanded criminal penalties for wage theft): Lee, *supra* note 39 at 662-665, 674 (describing the movement to criminalize wage theft); *California Labor Commissioner Launches Criminal Investigation Press Release IR #2012-09,* CALIFORNIA LABOR COMMISSIONER (February 27, 2012) http://www.dir.ca.gov/DIRNews/2012/IR2012-09.html [https://perma.cc/BK4V-MAUY] (creating a criminal investigation unit "designed to investigate employers who perpetrate wage theft and other criminal activities against workers); 820 Ill. Comp. Stat 115/14 (2015). New York also enacted a subsequent law in 2010, the Wage Theft Prevention Act, which increased civil penalties to 100% of the unpaid wages. N.Y. Lab Law § 198; Nanos, *supra* note 39.

[46] Cal. Lab Code § 512. The employee may waive the meal period if the shift does not exceed 6 hours. RICHARD SIMMONS, WAGE AND HOUR MANUAL FOR CALIFORNIA EMPLOYERS 166 (13th Ed. 2008). If it exceeds 6 hours but is less than 10 hours, the employee may take a meal period while "on duty" provided it is memorialized in a written agreement and "the nature of the work prevents the employee from being relieved of all duty." *Id.*

[47] Cal. Lab. Code § 226.7; Brinker Rest. Corp. v. Superior Court, 53 Cal.4th 1004 (2012) (holding that employer must merely a meal break available, rather than

make a paid rest period available to non-exempt employees for ten minutes for every four hours worked.[48] If the employer requires the employee to work during any rest period, the employer owes the employee an additional hour of pay.[49] A state meal or rest break violation could become an FLSA violation to the extent the employer fails to pay for the time worked and inclusion of that time would have triggered overtime pay.[50] It may also violate the FLSA if including the missed break time in the employee's hours worked pushed the employee's effective wage rate below the minimum wage.

Turning specifically to timekeeping, employers tend to establish two types of workplace timekeeping rules: employee conduct rules, and default rules regarding how time is calculated. Both types of rules must comply with federal, state, and local wage and hour laws. An employer may have employee conduct rules regarding timeliness, attendance, and unauthorized overtime—for example, a rule that employees must obtain a supervisor's permission before working overtime. However, should the employee violate the employer's rule and work unauthorized overtime, the employer must nevertheless pay the employee the overtime premium, as federal and/or state law requires. The employee can, however, be disciplined or even fired for failing to abide by the employer's conduct rule, unless the conduct rule is itself a violation of federal or state law.[51]

Federal and state law yields, in limited respect, to employer rules regarding the calculation of hours worked. For example, employers are permitted to engage in "rounding" of employee time stamps forward or backward, as long as the practice is not used to systematically disadvantage employees.[52] As the U.S.

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requiring them to take a break whether they want them or not); Simmons, *supra* note 46 at 169.

[48]   Simmons, *supra* note 46 at 172.

[49]   Cal. Lab. Code § 226.7.

[50]   29 C.F.R. § 785.19; McGone v. Contract Callers, Inc. 49 F.Supp.3d, 364 368 (2014). *See also* A. Kevin Troutman, *Automatically Deducting for Meal Breaks Can be Costly*, FISHER PHILLIPS (Aug. 1, 2012), https://www.fisherphillips.com/resources-newsletters-article-automatically-deducting-for-meal-breaks-can-be-costly [https://perma.cc/T7NM-8NDS].

[51]   An example of such a rule might be a rule that prohibits an employee from taking any breaks during a lengthy 10-hour shift. Many state laws guarantee breaks and meal periods for shifts exceeding a specified duration.

[52]   29 C.F.R. § 785.48 ("*Rounding' practices.* It has been found that in some industries, particularly where time clocks are used, there has been the practice for many years of recording the employees' starting time and stopping time to the nearest 5 minutes, or to the nearest one-tenth or quarter of an hour. Presumably, this arrangement averages out so that the employees are fully compensated for all the time they actually work. For enforcement purposes this practice of computing working time will be accepted, provided that it is used in

Department of Labor's regulations put it, a facially neutral rounding rule would both round up and round down, "averag[ing] out so that the employees are fully compensated for all the time they actually worked."[53] Rounding rules are discussed in greater detail in Part IV.C below.

An employer might also prefer to adopt timekeeping rules that automatically deduct meal and/or break periods from the employee's time worked. Federal law—and state law in some cases—permit meal periods to be deducted automatically, provided that the employee has a mechanism for informing the supervisor of a missed break that should not be deducted.[54] By contrast, federal law presumes that rest breaks between five and twenty minutes "must be counted as hours worked";[55] and California likewise requires that such breaks be paid. Counting a short rest break as unpaid time could therefore violate federal law or state law, depending on the circumstances.

III.METHODOLOGY

This article's analysis of timekeeping software was based on a review of the functionality of thirteen different timekeeping software programs, as recounted on the software maker's website or in YouTube demonstration and training videos.[56] These programs were selected primarily based on whether instructional YouTube videos were posted illustrating the software's functionality, following a YouTube search for

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such a manner that it will not result, over a period of time, in failure to compensate the employees properly for all the time they have actually worked.").

[53]   *Id.*

[54]   *See, e.g.*, Lopez v. G.A.T. Airline Ground Support, Inc., No. 09–CV–2268–IEG, 2010 WL 2839417 at * 3 (S.D. Cal. Jul. 19, 2010) (no record keeping duty under state law to record exact time of meal period); Berger v. Cleveland Clinic Found., No. 1:05 CV 1508, 2007 WL 2902907 at *13 (N.D. Ohio Sept. 29, 2007).

[55]   29 C.F.R. § 785.48.

[56]   The software included in the analysis are: TSheets, Patriot Software, Count Me In LLC, ADP Workforce Now, TimeKron, Hubstaff, Infinitime, Quickbooks/Intuit, WeWorked, GHG, Kronos, SpringAhead, and BigTimeSoftware.

We excluded companies that did not appear to serve a timesheet functionality for employers to use with non-exempt employees. Rather, some software programs are designed for individual use, for example, for individuals to monitor their productivity; for freelancers to track and invoice their time; or for organizations to bill for projects. These included CaseFox, Chromata, Harvest Time Tracking and Clicksoftware. These programs did not appear to have broader functionality for use in organizations to record time and pay employees working on an hourly basis some programs included in the sample had the functionality to bill for projects, but that functionality was integrated within or alongside functionality for tracking non-exempt employee time).

"timekeeping software"; "employee timekeeping software;" and "DCAA compliant timekeeping software" and similar terms. Secondarily, some programs were selected based on a Google search for timekeeping software. Additionally, one of the authors (Eigen) has spent many years reviewing and evaluating data from a variety of different commonly used timekeeping systems, and has served as an expert witness on both the plaintiff side and defendant side in wage and hour class and collective actions. Importantly, the goal of this project was not to survey all timekeeping software options on the market today, nor even to evaluate a random sample. Instead, the aim was to investigate the range of architecture and functions available, including in some of the most widely used programs.

Further, we chose not to purchase and install timekeeping software for two reasons. First, timekeeping programs are quite expensive;[57] purchasing and installing thirteen or more

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[57] Several software makers appear to use a "software as a service" pricing model, charging organizations at a fixed fee per month for each user, and offering premium software packages at a higher per-user-month fee. *See, e.g.*, TimeKron, *Pricing*, SOFTWARE TECHNIQUES, http://softwaretech.com/time-clock-software/pricing/ (last visited Sept. 17, 2016) (charging between $750 and $2,950 for its software, depending on the size of the employer). To illustrate, a company with 50 employees paying per user-month fee could expect to pay anywhere between $1,194 per year and $11,520 per year for its timekeeping software. In other words, timekeeping software can be quite expensive and is a non-trivial budget item for companies using the software. *See Time and Labor*, ADP FOR MIDSIZED BUSINESS, http://www.adp.com/solutions/midsized-business/products/workforce-now/time-and-labor.aspx [https://perma.cc/MBP4-BS43] (last visited Sept. 17, 2016) (describing a package of 'out-of-the-box features, as well as "popular add-ons", although it was unclear whether they sell the software as a service or as a platform); Timesheet Software. *Sign Up!*, WEWORKED, https://www.weworked.com [https://perma.cc/NH6P-Q574] (cost ranging from 1.99 per month to 49.99 per month, depending on the number of users); *Clockwise Pricing*, CLOCKWISE, http://www.ghg.com/pricing/ [https://perma.cc/L6FU-DUXS] (cost per month ranging from $5 per user-month to $9 per user-month based on chosen features); *Bigtime Increases Our Operating Margins By 25%*, BIGTIME, https://www.bigtime.net/pricing/ [https://perma.cc/6BRF-AEWX] (cost ranging from $5.60 per user/month to $19.20 per user/month depending on features, with an additional $5 per user-month charge for DCAA compliance). Timekeeping software can be quite expensive when deployed organization-wide. For example, a publicly available contract with a Pennsylvania county for a Kronos timekeeping software license priced it at $175,275, not including maintenance, implementation, or hosting. *Amendment No. 1. to Agreement for Application Hosting and Technology Support Services between Luzern County, Pennsylvania and ACS Government Systems, Inc.*, LUZERNE COUNTY, http://webcache.googleusercontent.com/search?q=cache:P7qRWXxFuuAJ:www.luzernecounty.org/content/File/Controllers%2520Office/Contracts/ACS%2520contract%2520for%2520time%2520and%2520attendance.pdf+&cd=1&hl=en&ct=clnk&gl=us (cached) [https://perma.cc/AFA2-EDHY] (last visited Sept. 17, 2016).

programs is cost prohibitive. Second, although some software programs offered free trials for a limited time, the terms of service appear to prohibit research usage.[58]

Nevertheless, the videos, descriptions, and software tutorials available online provide a high-level view of the architecture and operation of an array of electronic timekeeping programs. In some cases, the YouTube videos originated from the software makers themselves. In others, the videos were posted by third parties reviewing or demonstrating the software to others. One lengthy video—involving the Kronos timekeeping software—consisted of a training at the University of California-Santa Barbara (seemingly led by a university employee) for new managers. Some of the videos were viewed many times; the Santa Barbara training had more than 15,000 views.[59]

The sample included a range of software makers, from startups to large, established companies. The largest companies in the sample included Kronos, ADP, Quickbooks/Intuit, and GHG. On its website, Kronos claims that "tens of thousands" of organizations use its software, "including more than half of the Fortune 1000[.]"[60] ADP is a publicly traded company, primarily known for its payroll services. Its website claims that it pays "26 million (1 in 6) workers in the US," although it does not describe the its timekeeping software market share.[61]

Some of the companies in the sample appeared to be newer and closer to the size of a startup, based on descriptions on their websites. If one believes the claims on website materials and promotional materials, these smaller software solutions were

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[58] For example, Hubstaff offered a free trial, but its Terms of Service contract claimed that the "Service" is a "valuable trade secret" and contains "proprietary content, information and material" protected by intellectual property laws, and authorized use "only for the purposes set forth in these Terms." Although the contract did not expressly prohibit use of the software for research purposes, we were concerned that Hubstaff (or other software makers offering free trials), would allege as much, or allege that disclosure of any results of our testing would breach the confidentiality provision of the contract. *Hubstaff Terms of Service*, HUBSTAFF, https://hubstaff.com/terms [https://perma.cc/GQB3-CUWP] (last visited Sept. 17, 2016).

[59] Rich K, *UCSB Training Video, Kronos Workforce,* YOUTUBE, (May 16, 2014) https://www.youtube.com/watch?v=lHPSj2Md1h4 (last visited Sept. 25, 2016).

[60] *When is Time Not on Your Side?*, KRONOS, http://www.kronos.com/download/thank-you.aspx?did=1390&rr=0&LangType=1033# [https://perma.cc/4FRE-KP82] (Direct download) at 8.

[61] *Corporate Overview Sept. 2016*, ADP, http://www.adp.com/~/media/Corporate%20Overview/ADP-Corporate-Overview.ashx [https://perma.cc/JU7X-F2CR] (last visited Sept. 18, 2016).

also deployed widely. For example, TSheets, a startup founded in 2006,[62] projected that it would process $8 billion in payroll over a 12 month period.[63] The size and customer base for other companies in the sample were less clear from their respective websites. Some of these appeared to be smaller software businesses targeted primarily for use by small employers.[64]

YouTube videos and website materials provide a high degree of certainty about some aspects of timekeeping software, and limited visibility into others. These sources provide a high degree of certainty about the availability of certain features in software programs—where those features are demonstrated in YouTube videos, in videos or screenshots on the software maker's website, in marketing content from the software maker, or in its technical support documents.

Videos present some ambiguity, however, as to the default settings of the software.[65] Without using the software, it is difficult to know whether a feature illustrated in a screenshot or video represents the default configuration for the software, or settings adopted by a particular employer. For example, if a video shows a window popping up that asks supervisors to scrutinize and approve/reject overtime, it is impossible to tell whether the window represents the software's default settings, or whether the software simply enables the employer to implement pop-ups for supervisors, one of which could pertain to overtime hours. Indeed, the demonstrator of the software—whether a third party or the software maker him/herself—may be demonstrating a customized option. Additionally, the software may have changed in the intervening time since the video was posted. At most, we are able to infer that the software featured in the video *can* be used in the way illustrated.

IV. SOFTWARE FEATURES THAT UNDERMINE WAGE AND HOUR LAWS

As explained above, Category A timekeeping software can enable cheating, and can undermine wage and hour compliance.

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[62] *TSheets' Life Story*, TSHEETS, https://www.tsheets.com/about/ [https://perma.cc/Z75C-H54N] (last visited Sept. 2, 2016).

[63] *TSheets Raises $15 million To Grow Bigger, Faster, Stronger*, TSHEETS, (Oct. 5. 2015), https://www.tsheets.com/resources/funding-summit-partners-boise [https://perma.cc/7KU8-8RAY] (last visited Sept. 2, 2016).

[64] *Support Site for WeWorked.com*, WEWORKED, http://support.weworked.com/category/timesheets-approvals/ [https://perma.cc/9UKM-AU35] (contemplating a company size between 3 users and 100 users).

[65] Of course, the myriad different packages offered by software makers suggests that there is no single default setting even within a single program.

Broadly, the software features observed among Category A programs that can facilitate non-compliance include those that: (i) present situational cues that encourage supervisors to make unlawful edits to workers' raw time and attendance data; (ii) flag certain types of time entry for further scrutiny, and perhaps unlawful editing, by supervisors; and (iii) implement employers' own wage and hour rules, such as automatic break deductions. While these features can be used in a manner that complies with federal and state wage and hour laws, they also permit non-compliant use. We contrast these features with Category B software, whose functionality tends to restrict non-compliant use. Lastly, we examine a common software feature known as "rounding." Although rounding technically complies with substantive wage rules, we argue that can have the aggregate effect of shaving employee time when it interacts with employer attendance rules.

A. Timecard Editing Features

Category A programs typically allow supervisors to edit time entered by individual employees. These systems enable employers to structure permissions, whereby supervisors have access to the timecards of all of their supervisees. Supervisors review, edit and approve time logged or submitted by individual employees. Kronos illustrates this process through the diagram in Figure 1 below.

Figure 1. Typical Time Edit & Approval Process – Category A Software[66]
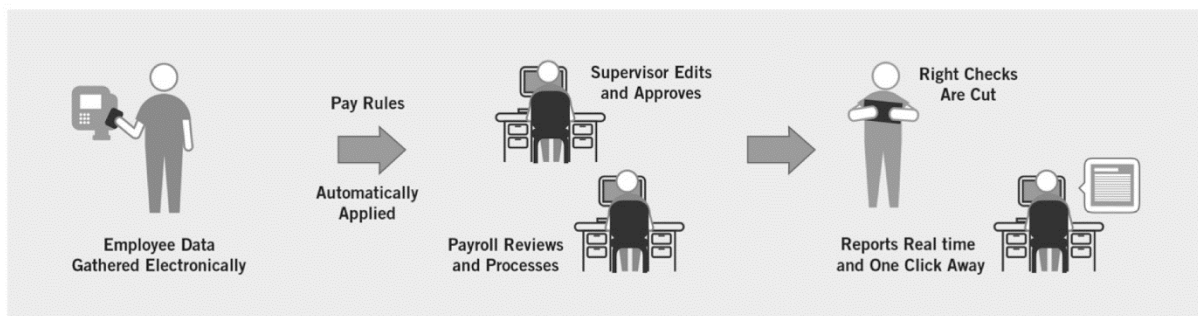
The editing functionality varies by software program. The most common such functionality consists of a button supervisors press to enable them to edit an entry. These buttons consisted of a drawing of a hand holding a pen or feather, or a button labeled

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[66] *Selecting an Automated Time and Attendance Solution Workbook*, KRONOS, at 15 (July 11, 2016), available at http://www.kronos.com/download/thank-you.aspx?did=23622320227&rr=0&LangType=1033# [https://perma.cc/VU3U-GBFE] (direct download).

"edit" (see Appendix, Figures 1 - 2). Also common were features that allowed supervisors to place a cursor in the individual employee's time sheet and edit the information, as if it were a cell in a spreadsheet (see Appendix, Figures 3 - 4). One software feature illustrates employee time cards on a "Time Slider," with which administrators may "correct" any "errors" by "simply clicking and dragging [the slider] to the correct times" (see Appendix, Figure 5). The software maker's description of the functionality even includes a picture of a child on a slide, characterizing the Time Slider as "almost as fun."[67]

In some cases, the graphical appearance of the editing feature creates a misleading impression that the underlying time data is overwritten. For example, in a cursor-based system, in which the supervisor edits the time as if were a spreadsheet, the act of "editing" appears to replace the old data with the new. Likewise, the process of editing time through a slider appears to the user as an alteration of the original time records, even though the original records are in fact preserved.[68] As discussed further below, one software program offers menu options to "delete" a particular entry or set of entries (see Appendix, Figure 6).

The visual appearance of the editing functionality is not necessarily related to the background functionality of the software; an employee's time could appear to be overwritten in the graphical interface, even as the underlying structure of the software preserves the original data and stores the edit as an additional line entry. However, as we will discuss in greater detail below, insights from behavioral compliance, ethics, and economics teach that the outward appearance that an entry has been deleted may subtly influence the way that supervisors use the software. In particular, the suggestion that the data will be deleted may lead the user to edit the timecard with greater impunity.[69]

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[67] Appendix, Figure 5.
[68] *TSheets   Introductory   Overview*,   TSHEETS, https://tsheets.wistia.com/medias/nu3smsi7zg   [https://perma.cc/2TKL-SJPC] (last visited Dec. 4 2016) (demonstrating the log generated by edits to employer timesheets).
[69] Jason Dana, George Loewenstein, & Roberto Weber, *Ethical Immunity: How People Violate Their Own Moral Standards Without Feeling They Are Doing So in* BEHAVIORAL BUS. ETHICS 197, 201 (2012) ("people can avoid accountability for difficult ethical decisions . . . when responsibility for these decision[s] . . . is diffused . . . . The actions of other people often diffuse responsibility . . . that enables individuals to take self-interested actions they would eschew if acting unilaterally.").

Some programs are structured—or can be configured—for users to provide a reason for the edit. Such functionality could be helpful for compliance purposes where the listed reasons are limited to legitimate use of the software, making it more difficult for users to rationalize unlawful edits. Indeed, the descriptions of edits are also useful after the fact, when a higher-level supervisor, auditor, or expert witness analyzes the data to ensure compliance with wage and hour laws.[70] However, some of the software we observed offers questionable justifications for employer edits, although it was unclear whether the available options originated from the employer-user or from the software program. One video offered the following menu options for justifying timecard edits: "unapproved - early punch," "unapproved - late punch," and "unapproved - out of schedule punch"[71] (see Figure 7, Appendix.). (This video was user-generated, and may have represented that institutional user's configuration of the software, rather than default options furnished by the software provider.) To the extent any of these reasons were used to justify edits to a timecard that reduced a worker's compensable time, they are most likely inconsistent with wage and hour law. As explained in Part II above, while working unapproved overtime can, in some circumstances, be the basis for discipline by the employer, including termination, an employer remains obligated to pay non-exempt employees the relevant required rate for every hour worked.[72] The presence of such options may lead an uniformed supervisor to believe that non-payment of overtime is permissible.

Another program offered the option to "Delete all punches and insert scheduled punches"[73] (see Figure 6, Appendix). There are legitimate uses for the option "Delete all punches and insert scheduled punches." For example, if an employee comes to work on her day off to retrieve personal items and punches in and out, those punches might legitimately be deleted and replaced with the scheduled punches (i.e. none at all). Likewise, if a timekeeping system malfunctions and records punches during an employee's vacation, those erroneous punches might be deleted and replaced with a pre-set number of hours of vacation time. However, even these scenarios seem somewhat of a stretch. In the alternative, such a feature could be used to avoid an overtime obligation, by substituting an employee's forty-plus actual hours worked with her forty hour scheduled shift, or reducing total hours worked in a day or the week. This is

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70   *See* discussion *infra* at Section IV.E.

71   It is unclear from the training video whether these options come pre-populated by the software manufacturer or were set up by the user or the user's administrator.

72   *See supra*, Part II.

73   *Id*.

especially problematic when mid-level managers are directly and personally incentivized to keep their budgets down, and minimize labor costs.

Further, after a supervisor edits an employee's time via one of these functions, the employee is not necessarily informed of the edit. Indeed, for Category A software, the available YouTube tutorials and software documentation suggest that edits are not returned to employees for review or approval.[74] Instead, the default process for Category A software—as depicted in the Kronos illustration in Figure 1 above—would appear to be that the supervisor "edits and approves" the timecard, which is forwarded directly to payroll for processing.[75] This conforms

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[74]   An employee with access to his or her own time card might have some visibility into the edits or the final amount approved for payroll.

[75]   It is somewhat of an oversimplification to describe "default" features for Kronos, or any other software package, in that offerings and features can vary considerably by employer size, and may even be customized to reflect the particular features purchased by the employee. In this respect, the software makers are somewhat like auto manufacturers, in that they may have various product models, and then each individual car can have a particular package of features if the customer is willing to pay.

For example, some software is by default configured as Category A but the software maker offers alternate packages or "add-ons" with the functionality of Category B software, where supervisor edits are either disallowed, or where the edits are automatically returned to the employee for further review. For example, the default configuration for Kronos software resembles Category A. However, Kronos offers an add-on called the "Attestation Toolkit" through which "[e]mployees can review and approve or reject any changes made by their managers during the current pay period." *Attestation Toolkit*, KRONOS, https://www.kronos.com/resources/attestation-tool-kit [https://perma.cc/82QP-92ZE] (last visited Sept. 18, 2016). Although Kronos does not disclose the adoption rate for the Attestation Toolkit, one blogger described it as "little-known." Ryan Baugh, *The Little-Known Kronos Toolkit You Should be Using*, VELOCITY (Oct. 23, 2015), https://velocitycloud.com/resources/blog/the-little-known-kronos-toolkit-you-should-be-using [https://perma.cc/V2Y8-9R4M] (last visited Sept. 18, 2016). Similarly, SpringAhead's timekeeping software's default functionality permits employer edits. *See* SpringAhead Demos, *SpringAhead Admin Review*, YOUTUBE, (Apr. 8, 2011) https://www.youtube.com/watch?v=qJCMOvUvU6g (last visited Sept. 18, 2016). However, a defense compliance consultant demonstrated a version of SpringAhead's software in which that functionality is absent, requiring employees to submit edits to their own timesheets, suggesting that SpringAhead makes alternate versions of the software available. *See* ReliAscentLLC, *SpringAhead Timekeeping Software Demo*, YOUTUBE, (Apr. 22, 2015), https://www.youtube.com/watch?v=9lmZBmkvomM (last visited Sept. 18, 2016). Likewise, BigTime software advertises two versions of its software—a default version permitting supervisor edits, and a more expensive "DCAA Compliance" version. *See Bigtime Increases Our Operating Margins By 25%*, BIGTIME, https://www.bigtime.net/pricing/ [https://perma.cc/42JA-CSWW] (pricing a DCAA compliance configuration that costs an additional $5 per user-month); *Tracking Time/Expenses*, BIGTIME, http://v4help.bigtime.net/tracking-time/expenses [https://perma.cc/KUM5-

with Eigen's experience observing dozens of timekeeping systems in action over the past decade.

In fact, the lack of transparency on the employee's side may be one of the reasons that wage and hour class actions and collective actions are so prevalent. Employees may not notice small infractions that might be brought to their employer's attention right away. Without the ability to see or notice small infractions contemporaneously, it is unlikely that well-meaning employers would ever be put on notice of such issues unless and until they receive a demand letter or a complaint alleging system-wide problems on a grand scale. The absence of transparency may also lead employees to distrust the timekeeping system, causing them to engage in more dishonest behavior regarding their own timekeeping. More transparency ultimately may lead to more honest behavior both by employees and their supervisors.

The freedom afforded to supervisors to edit subordinate timecards is unavailable in Category B software. Figure 2, a diagram from BigTime Software, illustrates this different functionality.

Y495] (last visited Sept. 18, 2016) [hereinafter BIGTIME, *Expenses*] (describing default version of software "When a user clicks the submit button, it's like a virtual version of handing in their timesheet. It gives you an electronic indication that they're done entering time and making changes for the week and they are ready for you to do whatever it is you'd like to do with that time! You can edit it, add it to invoices, send it over to QuickBooks or just ignore it!"); *DCAA Compliant Timesheet Review & Approval*, BIGTIME, https://www.bigtime.net/dcaa-timesheet-review-and-approval/ [https://perma.cc/2KAP-NSUE] (last visited Sept. 18, 2016) [hereinafter BIGTIME, *Compliant*] (describing DCAA compliant software, "as a manager, you're not allowed to make edits to [the employee's time]. The system is sophisticated enough that it can actually lock the things that you're not allowed to edit.").

**Figure 2: Typical Review & Approval Process –
Category B Software[76]**
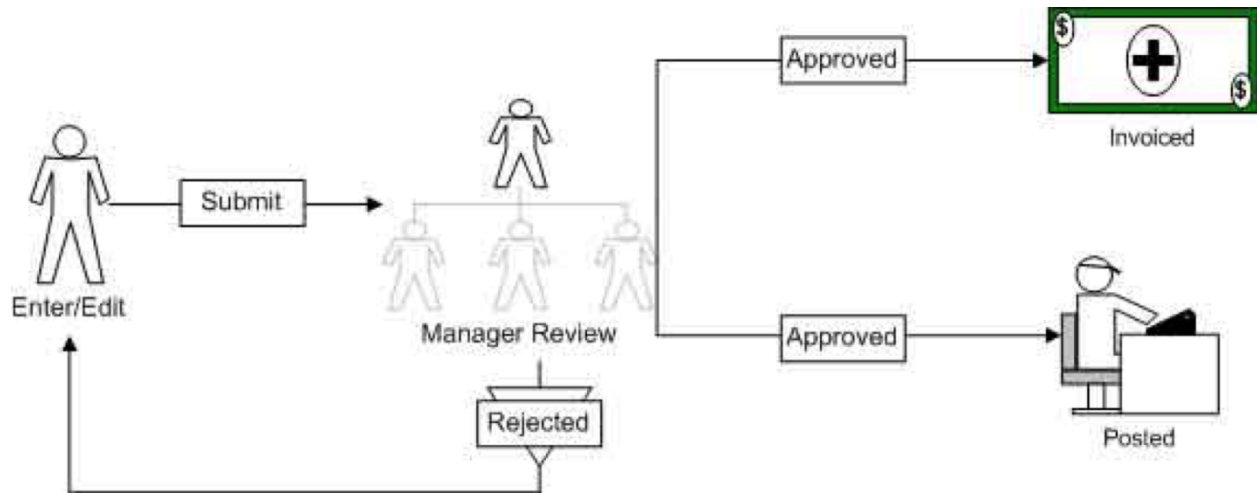
The software is structured to enable only employees to enter their time, which the supervisor can view.[77] Category B software does not permit the supervisor to make direct edits to employees' time and attendance data. Instead, managers with concerns about a timecard have the option of "approving" or "rejecting" a submission, which the employee can edit and then resubmit. Some Category B software further prompts employees to provide a reason for any modification they make to the timesheet.[78] Consequently, the structure of Category B software forces the supervisor to inform and involve the employee in any edits to the timesheet.

Software that provides supervisors with unchecked discretion to edit employee time is problematic from a behavioral compliance standpoint because supervisors have a strong incentive to limit payroll costs by shaving employee time.[79] Software makers openly cater to employer fears about spiraling

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[76]   BIGTIME, *Expenses*, *supra* note 75 (in context, this illustration refers to a version of BigTime software in which supervisors can edit employee timecards. However, BigTime offers a version of the software in which managers are not permitted to make edits. *See* BIGTIME, *Compliant*, *supra* note 75.

[77]   *See* BIGTIME, *Compliant*, *supra* note 75; *see also* ReliAscent, *supra* note 75; Debbie Sabin, *DCAA Compliant Timekeeping Software by GHG* (Dec. 10, 2015), https://www.youtube.com/watch?v=I4kr3bUNTuc.

[78]   *See, e.g.*, Sabin *supra* note 77.

[79]   *See, e.g.,* Françoise Carré & Chris Tilly, *America's Biggest Low-Wage Industry: Continuity and Change in Retail Jobs* (Inst. for Research on Labor and Emp't, Working Paper No. 2009-6, 2008) at 12 ("Managers must sparingly manage their use of work hours and many retailers control manager access to overtime for hourly workers (paid time and a half for hours over 40).").

payroll costs in their advertising, while carefully avoiding any statements suggesting that employers will use their software unlawfully to deprive employees of wages. ADP advertises, for example, "You can confidently help manage labor costs and compliance. And answer questions like, '[W]ho's working overtime?'"[80] Kronos advertises that its software can: "boost employee productivity and engagement while providing real-time insight into labor data to help control costs and reduce compliance risk."[81] These are not outright statements that invite employers to use the software to shave overtime. Nevertheless, they suggest that the questionable features described above play a central role in the competitive positioning of software makers.[82] In the absence of effective recordkeeping regulation from the Department of Labor, the market for Category A software has become somewhat of a race to the bottom.[83]

Even as software makers place considerable trust in the honesty of supervisors, that trust does not extend to the hourly employees themselves. Marketing materials emphasize the hidden cost of employees that inflate their hours worked, and pitch their technology as a means to hold hourly employees accountable.[84] Software maker TimeKron, for example, cites an

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[80]   ADP *supra* note 57.

[81]   *Workforce Ready Timekeeping*, KRONOS, https://www.kronos.com/products/workforce-ready-suite/workforce-ready-time-keeping [https://perma.cc/6M9G-W8J9] (last visited Sept. 18, 2016).

[82]   In some respects, the questionable features we describe are analogous to peer-to-peer file sharing services like Napster, or numbered Swiss bank accounts, both of which create a predominantly illegitimate use case for their existence and hide behind the claim that there are possible legitimate uses too. *See, e.g.*, A&M Records, Inc. v. Napster, Inc., 239 F.3d 1004 (9th Cir. 2001) (rejecting Napster's argument that Napster's file sharing functionality represents a form of fair use); Tim Wu, *When Code Isn't Law*, 89 VIRGINIA L. REV. 680, 685 (2003) (peer to peer software "successfully exploits the normative distinction between illegal 'stealing' and innocuous 'copying'"). By contrast, there are legitimate primary purpose products and services that have illegitimate secondary uses, like drones or kitchen knives. The question is whether these questionable features are more like Napster, or more like a kitchen knife. Ultimately, we focus less on the taxonomy of these features than on practical implications from a behavioral compliance standpoint—how should timekeeping architecture be designed and regulated to ensure more compliant than noncompliant behavior?

[83]   *See* Part V *infra*. For example, some Category A software makers offer add-on options that limit supervisor discretion or provide employees with greater access to information. See *supra* note 75. These features do not feature prominently in marketing materials for customers other than defense contractors. *Id*.

[84]   By focusing on wage theft by supervisors against employees, we are not suggesting that employee inflation of hours is not a problem or does not occur. Just as supervisors have an incentive to shave hours, so too do employees have an incentive to inflate their hours. In *Predictably Irrational*, Dan Ariely cites estimates that "employees' theft and fraud at the workplace [amount to] $600

American Payroll Association report that "a company can save up to 9% on payroll..[b]y eliminating human error, reducing buddy punching, and getting rid of duplicate data entry."[85] Kronos also describes the threat of employee fraud:

> Dishonest employees can take advantage of an honor-based paper timecard system, costing your company money and demoralizing employees who are honest. Automating your time and attendance solution can minimize payments for unworked time and boost employee morale. Forrester estimates nearly 12 percent of the hourly workforce regularly overstating two hours of work per pay period can be saved through automation.[86]

One client testimonial asserts, "Accountability is way up, and excess hours are way down."[87] Similarly, software maker Hubstaff asks potential customers, "Have an accountability problem?"[88]

Software makers build in functionality to prevent employees from inflating their hours. Software makers advertise that their automated or biometric time clock systems eliminate "buddy punching"[89]—whereby a co-worker punches in for an absent colleague.[90] Some systems prevent employees from making

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billion" annually. Dan Ariely, PREDICTABLY IRRATIONAL: THE HIDDEN FORCES THAT SHAPE OUR DECISIONS 195 (2010).

85   *TimeKron*, SOFTWARE TECHNIQUES, http://softwaretech.com/time-clock-software/ [https://perma.cc/Q5W4-9CNM] (last visited Sept. 18, 2016).

86   Kronos, *supra* note 66 at 22.

87   Kronos *supra* note 60 at 7.

88   Dave Nevogt, *How a 100% Remote Team Feels About Employee Monitoring Software*, HUBSTAFF BLOG, http://blog.hubstaff.com/employee-monitoring-software-from-employee-perspective [https://perma.cc/FKQ8-2TLG] (last visited Sept. 18, 2016).

89   Kronos *supra* note 66 at 15 ("If buddy punching is an issue for your company, you will want to make sure the vendor you select offers biometric and intelligent terminals. With biometric fingertip recognition technology, you can virtually eliminate time fraud, helping to ensure that the right person is clocking in and out."); *The best way to track employee hours*, INTUIT PAYROLL, http://payroll.intuit.com/additional-services/time-tracking/ (last visited Sept. 18, 2016) ("prevent employee abuse with time clock authentication").

90   TimeKron, *supra* note 85 ("With automated time clock software in place, the American Payroll Association reports that a company can save up to 9% on payroll. By eliminating human error, reducing buddy punching, and getting rid of duplicate data entry, the savings quickly add up.") Kronos, supra note 60 at 4 ("'Reduce payroll overpayments that put you over budget with automation that captures punches at the source and then secures the data, applies policies the same way every time, and stops costly 'buddy punching.'").

One YouTube video even includes a clip of an employee attempting to log in for a friend, followed by the statement: "stop buddy punching in its tracks."

changes to their own timecards, although this more commonly appears as an option for employers to configure according to their preferences.[91] By contrast, software makers in the Category A space do not approach supervisors' motives with the same level of suspicion. Instead, software makers present the edit-based functionality merely as a convenient device for edits that are consistent with wage and hour laws.

We are not making any empirical claims regarding the frequency with which Category A functionality is used for illegitimate purposes. However, behavioral compliance theory suggests that the structure of Category A software, and the situational cues it presents, are more likely to produce problematic behavior than software that falls into Category B.

Behavior compliance and ethics[92] research suggests that cheating is often not the result of a few bad apples, but rather that most people will cheat in small increments on a frequent basis, depending on the situational cues and circumstances.[93]

SkyWire, *Stop Buddy Punching in its Tracks with Count Me In*, YOUTUBE, (Apr. 8, 2014) https://www.youtube.com/watch?v=rNOjxdBJSJ4 (last visited Sept. 18, 2016).

[91]   *Introducing Inception Technologies Infinitime 7.08*, INCEPTION TECHNOLOGIES, http://www.inceptiontechnologies.com/pdf/IT_708_SS_r1.pdf [https://perma.cc/YN4F-8H2R] (last visited Sept. 18, 2016) ("InfiniTime can be configured to allow employees view-only access to their web timecard so that they can see their hours for the pay period."); BIGTIME, *Expenses*, *supra* note 75 ("once a user submits their time, they can't edit it anymore. Submitting a timesheet is just like handing in a paper timesheet, and once a user submits their timesheet, it's not theirs to work with anymore. It's now available for administrators and managers to review and edit."); Rich K, supra note 59 (explaining that the system is confirmed so the employee cannot make edits to their own card, but suggesting that the system could be configured in different ways).

[92]   Maurice E. Stucke, *In Search of Effective Ethics & Compliance Programs*, 39 J. CORP. L. 769, 807 (2014) ("An emerging field, behavioral ethics, uses insights from psychology to better understand how people actually behave when confronted with ethical dilemmas").

[93]   Lisa Shu, Francesca Gino & Max Bazerman, *Ethical Discrepancy: Changing Our Attitudes to Resolve Moral Dissonance in* BEHAVIORAL BUSINESS ETHICS 221 (De Crèmer & Tenbrunsel eds., 2012) ("Several studies have found that people lie and cheat on a daily basis and much more often than they dare to admit . . . . [W]hen given the opportunity to act dishonestly, a surprisingly large number of individuals do cross ethical boundaries"); Ariely, *supra* note 84 at 195-97 (describing two types of dishonesty—the robbing a bank type of dishonest, and "the kind committed by people who generally consider themselves honest—the men and women . . . who have 'borrowed' a pen from a conference site, taken an extra splash of soda from the soft drink dispenser, exaggerated the cost of their television on their property loss report, or falsely reported a meal with Aunt Enid as a business expense"); Rachel Barkan et al., *The Pot Calling the Kettle Black: Distancing Response to Ethical Dissonance*, J. EXP. PSYCHO. GEN. 757, 757 (2012) ("research suggests that people lie and cheat much more often than they care to admit").

First, cheating depends on opportunity — it will be more prevalent where the situation allows individuals to fudge the results in their favor than where no such discretion is provided.[94] When such opportunities present themselves, cheating is surprisingly prevalent. For example, in a study where business school students self-reported correct answers on a test, and had a very small financial incentive to inflate their correct answers (ten cents per answer), the majority of the study subjects inflated their answers, by an average of four answers.[95] In addition, people are more likely to steal when the item stolen is in units other than cash—such as food in a communal fridge, or poker chips.[96] They are also more likely to cheat where they have other ways to distance themselves from the transaction—such as giving a questionable expense reimbursement to an administrative assistant to submit, rather than submitting it themselves.[97] Prevalence of cheating flows from the extent to which individuals can rationalize the dishonest conduct and maintain their identity as honest people.[98] Of particular relevance for our context, behavioral economist Dan Ariely observes that "electronic transactions, with no physical exchange of money from hand to hand, might make it easier for people to be dishonest—without ever questioning or fully acknowledging the immorality of their actions."[99]

Cheating is also more prevalent where others are observed engaging in dishonest conduct.[100] This is especially true if

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[94] Many of Dan Ariely's experiments consist of situations where students are given a quiz of some sort, and then instructed to hand their answers in, or grade the answers themselves and shred the original. He then estimates the difference in number of correct answers between the groups with and without an opportunity to cheat. Ariely, *supra* note 84, at 200-220. See also Shaul Shalvi et al., *Justified ethicality: Observing desired counterfactuals modifies ethical perceptions and behavior*, 115 ORGANIZATIONAL BEHAVIOR AND HUMAN DECISION PROCESSES 181 (2011) (opportunities to cheat based on rolling dice visible only to the experiment participant).

[95] *Id.* at 199-201.

[96] *Id.* at 217-218.

[97] *Id.* at 224.

[98] *Id.* at 222. *See also* Yuval Feldman*, Behavioral Ethics Meets Behavioral Law and Economics in* THE OXFORD HANDBOOK OF BEHAVIORAL ECONOMICS AND THE LAW 222 (2014) (research findings "indicate that people cheat only to the extent that they can maintain their self-concept of being honest"). Indeed, those engaged in unethical conduct may do so without even fully realizing the ethical dimension or consequences of their decision. See David De Cremer, *On The Psychology of Preventing and Dealing with Ethical Failures: A Behavioral Ethics Approach in* MANAGERIAL ETHICS 112 (Marshall Schminke ed., 2010).

[99] *Id.* at 226.

[100] *See* Cass Sunstein, SIMPLER 65-68 (2013) ("most of us are affected by the beliefs and actions of others. With respect to obesity, proper exercise, alcohol consumption, smoking, being vaccinated, and much more, the perceived

employees are receiving mixed messages about company values—for example, a formal policy prohibiting certain conduct, where other policies, practices, and company culture undermine that policy.[101] The "other people" that influence behavior may also be software designers who structure software to permit cheating, which legitimizes noncompliance by sending the implicit message that others are engaged in similar conduct.

As Richard Thaler and Cass Sunstein argue from the behavioral economics perspective, default settings have a strong influence on behavior.[102] Thus, the default choices that software programs design into systems' architecture will strongly influence how that software is ultimately used.[103] In this respect, as Lawrence Lessig has observed, "code is law."[104] Computer

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decisions of others can have a big influence on individual behavior and choice."); Robert Cialdini, *The Triple Tumor Structure of Organizational Dishonesty in* CODES OF CONDUCT 48 (1996) ("People frequently decide what is appropriate to think, feel and do in a situation by examining what others like them are thinking, feeling and doing"); Robert Cialdini, Raymond Reno, Carl Kallgren, *A Focus Theory of Normative Conduct: Recycling the Concept of Norms to Reduce Littering in Public Places*, 58 J. OF PERSONALITY & SOCIAL PSYCH. 1015 (1990) (research subjects more likely to litter in litter-filled areas, and when they observe others littering); Francesca Gino, Shahar Ayal & Dan Ariely, *Contagion and Differentiation in Unethical Behavior*, 20 PSYCHOLOGICAL SCIENCE 393 (2009) (research subjects more likely to cheat when person on their team observed cheating); Stucke, *supra* note 92 at 813-814.

101 Feldman, *supra* note 11, at 222 ("people cheat only to the extent that they can maintain their self-concept of being honest"); Stucke, *supra* note 92 at 806 (describing how mixed messages at General Electric—imposing ambitious growth goals while also prohibiting antitrust violations—ultimately produced non-compliance). *See also* Scott Killingsworth, *Modeling the Message: Communicating Compliance Through Organizational Values and Culture*, 25 GEO. J. LEGAL ETHICS 961, 961-962 (2012) (research by behavioral scientists suggests that organizations need to "acknowledge, and harness, powerful drivers of ethical behavior that, while not usually thought of as communications channels, nevertheless send unmistakable messages which employees internalize and act upon.")

102 RICHARD THALER & CASS SUNSTEIN, NUDGE (2008) at 85-89; *see also* Cass Sunstein, THE ETHICS OF INFLUENCE 26 (2016) ("Default rules are probably the most obvious and important nudges."); SIMPLER, *supra* note 100, at 58-59 (2013).

103 Sunstein also argues that defaults have a normative effect on behavior beyond inertia or procrastination: "If your employer automatically enrolls you in a savings plan, or if your state automatically presumes that people consent to organ donation, you might think that most people, or most informed people, believe that these are the right courses of action[.]" SIMPLER, *supra* note 100, at 111.

104 Lawrence Lessig, CODE AND OTHER LAWS OF CYBERSPACE 6 (1999); R. Polk Wagner, *On Software Regulation*, 78 S. CAL. L. REV. 457, 460 (2005) ("the regulatory nature of technology is a point not at all confined to cyberspace"); James Grimmelmann, Note, *Regulation by Software*, 114 YALE L. J. 1719, 1729 ("[S]oftware also limits behavior. By giving its users a set of possible actions, it excludes every action not within this set.").

code, perhaps more than legal code, determines the bounds of permissible and prohibited behavior. Where default software options tacitly permit or encourage cheating,[105] behavioral compliance, ethics, and economics predict that those settings will encourage cheating to a much larger extent than if the default settings were different. [106]

Thus, theory suggests that Category A software is much more likely to result in wage theft by supervisors than Category B software or a paper system. First, to state the obvious, supervisors cannot use problematic software features if those features are absent from the software. Second, supervisors may defer to the authority[107] of Category A software makers and assume that software makers would not include any functionality that is legally problematic.

Third, Category A software makes cheating much easier,[108] and much more removed from the idea of wage "theft" than other ways to accomplish the same result. Supervisors can, of course, force their employees to work "off the clock" without the use of software. For example, a supervisor could instruct an employee to clock in after starting work or clock out before finishing work. In that case, the practice would at least be known to the employee. Indeed, such allegations are not uncommon in wage and hour suits.[109] However, doing so requires a much more overt act on the part of the supervisor. The supervisor's identity as an honest person becomes subject to challenge when she tells a subordinate to work off the clock, not only in her own mind but by a subordinate who objects to the instruction. In contrast,

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[105] Wu, *supra* note 82 at 682 ("The code designer…redesigns behavior for legal advantage…Code design, as a means of avoiding laws, serves as a particularly useful device for exploiting the internal dynamics of regulated groups.")

[106] In *The Ethics of Influence,* Cass Sunstein offers a menu of different types of choice architecture or "nudges" that can influence behavior, including default rules, "disclosure . . . simplification . . . warnings..reminders . . . increases in ease and convenience . . . personalization . . . framing and timing . . . increases in salience . . . [and] use of social norms," among others. THE ETHICS OF INFLUENCE, *supra* note 102, at 26.

[107] Milgram, Stanley, *Behavioral Study of obedience*, 67 J. OF ABNORMAL & SOCIAL PSYCH. 371 (1963).

[108] THE ETHICS OF INFLUENCE, *supra* note 102, at 21 ("Some nudges work because…they make certain choices easier; people often choose the path of least resistance.").

[109] *See, e.g.*, McGlone v. Contract Callers, Inc., 49 F. Supp. 3d 364, 366 (S.D.N.Y. 2014) (employees alleged they were required to record exactly 40 hours of work each week on timesheets, regardless of time actually worked); Monroe v. FTS USA, LLC, 763 F. Supp. 2d 979, 984 (W.D. Tenn. 2011) (plaintiff alleged that supervisors directed employees not to record time spent working); Lyles v. Burt's Butcher Shoppe & Eatery, Inc., No. 4:10-CV-53, 2011 WL 4915484 at *2 (M.D. Ga. Oct. 17, 2011) (alleging that employer "instructed Plaintiff to clock in and out so as to not exceed forty hours of Clock Time").

Category B software is designed to require just such a confrontation, forcing the supervisor to instruct employees to make edits to their own timesheets, which (if the edits are unlawful) similarly threatens the supervisor's identity as an honest person. Even a paper system requires more active participation on the part of the supervisor, by forcing her to physically cross out reported time and overwrite it with a different number. A supervisor engaging in such conduct is likely to have more conscious awareness that she is altering the records in a questionable way.[110]

Further, Category A software makes wage edits more tempting and more likely because the information appears in the software as hours, not dollars. Although supervisors' edits may have the effect of reducing an employee's paycheck, their alterations are not denominated in dollars, but in hours subsequently converted to dollars. A cursor-based editing system, where the supervisor believes he or she is deleting and replacing the existing number (regardless of whether the data is preserved in the underlying software), removes the uncomfortable reminder of the original hours submitted by the employee. A slider for adjusting an employee's working hours feels even more removed from stealing, and may even be experienced by the user as visually "lining up" an employee's hours worked with an even number of hours, or a scheduled shift.

Moreover, the terminology used by software makers for employer modification of hours worked tends to legitimize illegitimate reductions in workers' time. Several Category A programs use the word "edit" to refer to supervisor modifications. See Appendix, Figures 1-2. The use of the word "edit," as opposed to a narrower word, such as "correct," suggests that such functionality can be used for broader purposes than simply correcting a mistake or filling in missing information. In

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[110] Notably, however, the identity of the workers whose hours are being altered may influence the supervisor's self-conception. As one of us has argued elsewhere, employers may view low-wage immigrant workers' rights on the job differently from U.S. workers, as employers may have adopted what scholars have called a "dual frame of reference," in which the employer views him or herself as the charitable provider of a job to a worker whose alternative employment options in his or her country of origin are extremely limited. Therefore, even an employer who knowingly engages in wage theft from immigrant workers in the United States can maintain a self perception as honest, or even benevolent, because even sub-minimum wages in the United States are presumably higher than subsistence wages in the worker's country of origin. Put another way, the low-wage immigrant worker's power within the transnational labor market may be insufficient to trigger feelings of dishonesty or guilt in a law-breaking U.S. employer. Charlotte Alexander, *Explaining Peripheral Labor: A Poultry Industry Case Study*, 33 BERKELEY J. EMP. & LAB. L. 353 (2012).

one software demonstration, the narrator illustrates the "edit" feature as a way to fill in missing time when an employee forgets to punch. Of course, if the purpose were limited to filling in missing time, the software could be designed so as to permit edits only when information is missing.

B. Computational Shortcuts to Cheating: Reconcile Functionality

Another feature of Category A software is "reconcile" functionality, through which the software flags certain types of time entry for additional scrutiny. See Appendix, Figure 8. This functionality has also been described as "managing by exception,"[111] and is pitched as an efficiency tool allowing supervisors to triage which types of time punches merit further review and which ones can be approved automatically.[112] This, too, is not unlawful per se, and could be used for legitimate purposes. A supervisor might have a legitimate interest in reviewing overtime worked in order to assess staffing needs, identify unauthorized overtime, and make budget adjustments, for example.

Software makers pitch "reconcile" functionality as a way to make supervisors aware of time entry issues—a way to "spot trends quickly, and proactively address attendance issues."[113] For example, Kronos pitches "management by exception" as a way to "find and correct missed punches, respond to time-off requests, and flag and approve overtime."[114] However, if the reconcile feature were merely informational in nature, it would be structured and characterized as a "report," not embedded into

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[111] ADP, A*DP Workforce Now Essential Time* 1, https://www.adp.com/~/media/Workforce%20Now/pdf/ADP-WorkforceNow-Essential-Time-Fact-Sheet.ashx [https://perma.cc/XGS6-6L9D] (last visited Sept. 18, 2016).

[112] *Id*.; *see also*, OFFICE OF THE CONTROLLER, PAYROLL DIV., *Reconciling and Approving Timecards*, CITY & CTY. OF DENVER (July 10, 2016, 11:20 PM), www.denvergov.org/portals/679/documents/managertoolbox/kronos/quickrefer ences/mgr_quickref_reconciling_and_approving_timecards.pdf; Stanford University Information Technology and Services, *Reconcile Timecard Genie*, STANFORD UNIV., INFO. TECH. & SERVS. (July 10, 2016, 11:32 PM), web.stanford.edu/dept/itss/projects/kronos5/tutorials/employee_timecards/rec oncile_timecards.html [https://perma.cc/S5QU-BB6M]; Managers ADP eTime Training Manual ROGER WILLIAMS UNIV. (Aug. 2014), http://www.rwu.edu/sites/default/files/downloads/finance/payroll/managers_a dp_etime_training_manual.pdf [https://perma.cc/AK9E-32WP] (last visited Sept. 18, 2016) (illustrating functionality of reviewing exceptions).

[113] ADP, *supra* note 111 at 1.

[114] Kronos, *supra* note 60. *See also* Roger Williams University, *supra* note 112 (reconciling functionality used for identifying unauthorized absences, missed punches, or to review comments on a timesheet).

the functionality for reviewing and approving (or rejecting, or modifying) employee time. Indeed, Category B software makes similar information available, but does so in the form of a report for review.

Just as the use of the word "edit" suggests that supervisors can and should modify time for purposes other than corrections, the use of the word "reconcile" or "manage" legitimizes wage edits.[115] Dictionary definitions of the term "reconcile" – "to make consistent or congruous" and "to check (a financial account) against another for accuracy"[116] – suggest that one form of input will be modified to conform to another. Presumably, the raw data will be modified to conform to the supervisor's preferences regarding the number of hours that "should have" been worked, rather than those actually worked.

Indeed, some embedded functionality suggests that reconciling can serve to undermine substantive wage and hour rules. For example, "reconciling" functionality can flag "early in" punches or "late out" punches,[117] which impose additional costs on the company and which managers have an incentive to edit to meet budget.[118] (See Appendix, Figure 8.) "Reconcile" flagging can also identify any overtime for review by a supervisor.[119] One video showed reconciling used to scrutinize overtime, which provided supervisors with the option to approve "all," "some," or "none" of the overtime worked.[120] (See Appendix, Figure 9.) As

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[115] NUDGE, *supra* note 102 at 21 ("Some nudges work because of social influences. If you are told what other people do, you might do it too, because you think it's probably a good idea to do what they do…A default rule might be effective for just that reason; it has the power of suggestion."); On Amir & Orly Lobel, *Stumble, Predict, Nudge: How Behavioral Economics Informs Law and Policy*, 108 COLUM. L. REV. 2098, 2121-22 (2008) ("the frame in which information is presented both responds to and constructs social norms. Preferences are endogenously shaped by the framing and setting of defaults . . . defaults themselves are norm generating.").

[116] *Reconcile*, MERRIAM-WEBSTER, http://www.merriam-webster.com/dictionary/reconcile [https://perma.cc/C78R-EZ3Y] (last visited July 10, 2016).

[117] Kronos, *supra* note 66 at 17 (advising employers to select software that "allow managers to see which employees are approaching overtime or are absent at the start of their shifts, so the managers can react immediately to correct the situation"); CITY & CTY. OF DENVER, PAYROLL DIV., OFFICE OF THE CONTROLLER, *supra* note 112, at 1.

[118] *See* Carré & Tilly, *supra* note 79 (discussing supervisor pressure to avoid overtime).

[119] WorkForceIQ, *Reconcile Flagging Notification Settings*, YOUTUBE, (May 13, 2012) https://www.youtube.com/watch?v=xzVw_f-Q6Lw.

[120] Rich K, *supra* note 59. *Compare* narration in Scott Campbell, Kronos Timekeeper Training for Managers and Approvers (July 19, 2016), https://www.youtube.com/watch?v=4HmNlQ0Iq5Y (last visited September 25, 2016) ("all overtime in the Kronos system will automatically be assigned to a

previously noted, an employee who works unapproved overtime may be disciplined by an employer, but the lack of approval does not render those hours uncompensable. Although the default selection for the pop-up window is to pay "all" overtime hours, the presence of the other options suggest that paying employees for overtime is "optional." In addition, social science research suggests that "some" will be an attractive option because it represents an intermediate choice between "all" and "none." The well-documented "compromise effect" finds a consistent bias in favor of the intermediate option where three options are presented.[121] Thus, supervisors are likely to choose the "some" option even if they have no intention to cheat.

Another program offers a reconcile option that enables supervisors to "carry forward" hours worked from one pay period to another.[122] (See Appendix, Figure 10.) The most obvious use for such a feature would be to move employee time from a week in which the employee worked overtime to a week in which the employee did not, to avoid paying the overtime premium. We are hard pressed to identify any situation in which carrying forward hours would be compliant with wage and hour law.[123] In the audio that accompanies a training video on this software, the narrator explains that the functionality is intended to facilitate the payment of *additional* compensation to the employee by moving the hours to a pay period in which the employee is eligible for double time: "Carry forward hours is used to have excess time from one pay period forwarded on to another pay period. This is normally done in replacement of overtime with double time."[124] However, the functionality visible from the video

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code called 'unapproved overtime.' In order for the student to be paid for that time, the manager must use the transfer protocol we just saw to transfer that time from unapproved overtime from to approved overtime.").

[121] *See, e.g.*, Ravi Dhar, Stephen Nowlis, & Steven Sherman, *Trying Hard or Hardly Trying: An Analysis of Context Effects in Choice*, 9 J. CONSUMER PSYCH. 189 (2000); Itamar Simonsson, *Choice Based on Reasons: the Case of Attraction and Compromise Effects*, 16 J. CONSUMER RESEARCH 158 (1989); Itamar Simonsson & Amos Tversky, *Choice in Context: Tradeoff Contrast and Extremeness Aversion*, 29 J. OF MARKETING RESEARCH, 281 (1992) ("the attractiveness of an option is enhanced if it is an intermediate option in the choice set and is diminished if it is an extreme option").

[122] WorkforceIQ, *Carry Forward Hours*, YOUTUBE, https://www.youtube.com/watch?v=J5VfilICLlk (Mar. 13 2012).

[123] Carry forward hours could in theory be permissible for purposes of calculating compensatory time off to employees exempt from overtime – extra time off for working additional hours. Simmons, *supra* note 45 at 289. Compensatory time off is not permissible under the FLSA for non-exempt employees. *Id*. The "comp time" justification is somewhat questionable in two respects. First, employers do not typically track hours for exempt employees. Second, a strict comp time system for exempt employees can undermine their exempt status by calling into question whether they are truly paid on a salary basis. *Id*.

[124] WorkforceIQ, *supra* note 122.

does not suggest that the feature is limited to "carry forward" situations that are favorable to the employee. As Figure 10 (Appendix) shows, the plain text description of the feature provides that "you can take excess hours that an employee works in one Pay Period and apply them to future Pay Periods."[125] Perhaps acknowledging the questionable legality of this feature, the program advises users to "consult an advisor for all legal restrictions in your area" before proceeding.[126]

Like the time card edit functionality, "reconcile" features present situational cues that facilitate cheating. "Reconciling" makes it cognitively easier to cheat because the questionable functionality is presented as a legitimate supervisor task rather than a form of dishonesty. Reconcile features also make cheating more efficient. A supervisor wishing to shave overtime in paper records would need to scour the records, add up hours to identify the overtime hours, and then physically modify hours associated with overtime before they are sent to payroll. By contrast, Category A software does all of the work of identifying overtime hours (or any other type of hours the supervisor wants to scrutinize), enabling the supervisor to modify the exact entries associated with the overtime hours without further effort. Even Category B software demands more effort on the supervisor's part—while the "report" functionality could identify overtime hours, the supervisor would need to then "reject" the hours worked and co-ordinate with the affected employee to resubmit a lower number of hours. Behavioral compliance theory would predict that Category B software would result in less cheating, simply because the cheating process requires more effort and the architecture presents fewer opportunities to rationalize away the conduct.

C. Automated Defaults Dominate Manual Overrides: Automatic Break Deductions

Category A software also allows the employer to act like a software designer, in that employers may set up "rules" for how time is handled.[127] In particular, software can enable the employer to specify break "rules" that automatically deduct meal or rest breaks from the employee's hours. (See Figures 11[128] & 12[129], Appendix.)

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[125] *Id.*, Figure 10 (Appendix).

[126] *Id.*, Figure 10 (Appendix).

[127] Lawrence Lessig's phrase "code is law" refers to software's role in "constrain[ing] behavior." Grimmelman *supra* note 104 at 1719 (note) (2005); Lessig, *supra* note 104.

[128] WorkForceIQ, *supra* note 119.

[129] ShiftPlanning, *ShiftPlanning Tutorial – Lunch and Break Times*, YOUTUBE, (Jan. 12, 2012) https://www.youtube.com/watch?v=mrPlI8QZYG8.

For example, one YouTube video provides the following example of an automated break rule:

> Non-paid breaks will be deducted from the total number of hours an employee works. For example, if you have an employee scheduled to work 8AM to 5PM Monday to Friday that's actually 45 hours of scheduled time. Using the above break rules however, we know that this employee isn't actually working 45 hours. And both their overtime and reports will show the adjusted 40 hours of work.[130]

Where state wage and hour law permits a meal or rest break to be unpaid, there is nothing unlawful per se about automatically deducting such unpaid periods from an employee's paycheck. Suppose, however, that the employer structures the software break rules in a manner that does not comply with state wage and hour rules—for example, deducting ten minutes for each of two rest breaks where state law requires that such rest breaks be paid. Once adopted, that rule will be implemented for each paycheck for whatever class of employees is designated by the employer—for example, all non-exempt employees nationwide.

To the extent that individual employees have access to their electronic timecards, break deductions may not be visible, and may not even be visible as an edit. Likewise, even where edits to individual timecards are visible to an individual employee, only the employer knows which class of employees are subject to the deduction rule and how long deductions have been occurring.[131] A plaintiff's lawyer who learns of an individual employee's unlawful deductions may have to guess about whether the deduction was sufficiently widespread to support the costs of pursuing a class or collective action.

Software also facilitates cheating based on design decisions—and user decisions—about which types of actions will be automated and which will be manual. Automated actions function like a default setting. Functionality that is automated is the default result, unless that result is manually overridden.

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[130] *Id.*

[131] Grimmelmann, *supra* note 104 at 1736 ("[s]oftware is asymmetric. The programmer can determine its responses, but the users sees only the results of the software's individual decisions—allow this action, forbid that one-and lacks access to accurate knowledge of the set of inputs that determined a particular output.")

Where the manual override is difficult to implement, the force of the automated choice becomes especially strong. Suppose, for example, that an employer structures its break rules to automatically deduct an unpaid thirty-minute meal period from an employee's time entry but the employee worked through the meal period. Overriding the automatic deduction requires some additional action on the part of the individual employee and/or supervisor. If the software is not configured to permit the employee to modify his or her own timecard,[132] the employee may need to alert the supervisor to modify the timesheet on his or her behalf. Or perhaps the employer instructs the employee to enter a note into a physical log book to indicate a missed meal period, which the employer then enters into the software at a later date.[133] Because the system defaults to deducting the break from the meal period, any omission or gap in the override system—whether the employee's failure to note the missed break, or the supervisor's failure to enter it into the system—favors the employer over the employee. The aggregate effect of the default break rule is equivalent to a form of wage-shaving.[134]

Software makers pitch automatic break rules as a necessary time-saver for employers previously burdened with entering breaks manually. This represents somewhat of a sleight of hand for both software makers and the employers that use their system. Both know that the sophisticated login functionality within the software – pitched as anti-fraud protection against employees' attempts to log more hours than they have worked – could track breaks more accurately than the automatic rules. For example, employees working with call center software are automatically logged in and out of the timekeeping system when they open and close the call center software.[135] Other software allows employees to log in and out with their cell phone or with a swipe of their ID card.[136] There

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[132] For example, Kronos can be set up to preclude employees from modifying their own timesheets. Rich K, *supra* note 59.

[133] Berger v. Cleveland Clinic Foundation, *supra* note 54.

[134] As with the employer edits discussed above, phantom break deductions can violate both the overtime and minimum wage provisions of the FLSA, causing workers' recorded hours to dip below forty when they should have triggered the overtime requirement, and/or bringing workers' effective hourly wage below the required minimum.

[135] Waine-Golston v. Time Warner Entertainment, No. 11-CV-1057, 2013 WL 1285535 *3 (S.D. Cal. March 27, 2013).

[136] *See supra* note 2; *see also*; Hamadou v. Hess Corp, 915 F. Supp. 2d 651, 655 (S.D.N.Y. 2013) ("employees log into a computer at the Hess station to 'clock-in' and 'clock-out' at the beginning and end of their shifts"); Rogers v. Brauer Law Offices, PLC, No. CV-10-1693, 2012 WL 426725 (D. Ariz. Feb. 10, 2012) (records based on "clocking in and out of BLO's telephone system"); Arencibia v. 2401 Rest. Corp., 831 F. Supp. 2d 164, 172 (D.D.C. 2011) ("employees clock in and out each day using a computer system called Micros."); Dominguez v.

are many low cost behavioral tracking systems that enable more accurate methods. Employers do not maintain automatic break rules to save time; notions of efficiency rationalize a system that weighs in the employer's favor.

Even where employers use an employee's raw time card data to calculate breaks, at least one software maker offers an automated overlay that reclaims the break for the employer. As illustrated in Figure 12 (Appendix), the software "auto-adds" a break where the system indicates that the employee did not clock out for a break ("when a person works the Required Shift Length, but does not punch in or out for this break, the system will automatically add this break.") It is of course possible that an employee took a break but failed to clock out to reflect that break. Software makers might also defend the the "auto-add" functionality based on a California rule requiring that employers in that state provide an "opportunity" for a break.[137] Where the employee was provided such opportunity and did not take it, the "auto-add" functionality may be defensible, depending on the circumstances. Nevertheless, the same software functionality could be used to avoid wage and hour law – such as an employer that routinely deprived employees of an opportunity for a break and nevertheless deducts those breaks from employees' wages.

D. *Statistical Cheating: Rounding Rules*

Timekeeping software also enables a kind of statistical cheating, in the form of "rounding" rules, which round workers' hours up or down to a pre-set point. A common unit of rounding appears to be seven minutes.[138] Time punches up to seven

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Quigley's Ir. Pub, Inc., 790 F. Supp. 2d 803, 807 (N.D. Ill. 2011) ("servers are required to clock-in and clock-out on the computer system using their individual employee number"); Berger v. The Cleveland Clinic Found., *supra* note 54 at *3 (employee "record[ed] the time he worked by swiping his electronic badge in an electronic reader at the start and end of his shift"); TSheets, "Mobile Time Tracking: What Time Clock App is Right for Your Business?" https://www.tsheets.com/mobile-time-tracking [https://perma.cc/23Y8-AYXQ] (describing "iPhone Time Tracking App": "[w]ith the simple touch of a button and easy-to-use graphical interface, employees can easily clock in, clock out, take a break…—all in real time").

[137] Brinker Rest. Corp. v. Superior Court, 53 Cal.4th 1004, 1040 (2012).

[138] *KRONOS Grace Periods and Rounding*, UNIV. OF MIAMI (July 10, 2016, 11:51 PM),
https://umshare.miami.edu/web/wda/payroll/ElectronicTimekeeping/kronos_grace_periods_and_rounding.pdf [https://perma.cc/QHD5-99D2]; Payroll & Employee Benefits: Understanding the Kronos Punch Rounding Rule, BALL STATE UNIVERSITY (DEC. 12, 2017, 9:51 AM) https://cms.bsu.edu/-/media/www/departmentalcontent/payroll/pdfs/kronos%20rounding%20rules.pdf?la=en [https://perma.cc/2GRL-FTY3]; *Rounding Procedures*, VANDERBILT UNIV. (July 10, 2016, 11:55 PM),

minutes prior to or after the hour are treated as having been entered exactly on the hour.[139] Consequently, the rounded punches ultimately used to calculate payroll will always be in fifteen minute increments.[140]

The federal DOL regulations authorizing rounding date back to 1961, and have not been amended since then.[141] At that time, rounding rules represented a practical allowance from a pre-digital era, where computing time sheets by hand, by the minute, would have been extremely burdensome. No such efficiency-based justification exists for incorporating rounding into timekeeping software, which can both track and compute time at the millisecond level, automatically.

Nevertheless, rounding remains a key feature in timekeeping software because it can be used to favor the employer's interests over the employee's, in the aggregate. While courts do not permit overtly unfair rounding rules, facially neutral rounding rules can act like casino odds when they interact with employer attendance policies – consistently favoring "the house." Suppose for example, that the employer adopts a rounding rule where time is rounded to the nearest seven minutes—a login five minutes before or after the hour is treated as a login exactly on the hour (e.g. arrival for a shift at 8:55 or 9:05 is treated as a login at 9:00). Likewise, a logout five minutes before or after the hour is treated as a logout exactly on the hour (departure at 4:55 or 5:05 is treated as a logout at 5:00). This system is facially neutral. If there were a symmetrical distribution of logins and logouts before and after the hour, the net effect would not favor or disfavor the employer, consistent with the requirements of the DOL's rounding regulations.

However, some employers expect that logins and logouts are not symmetrical, primarily owing to their promulgated attendance policies. Under typical employer policies, employees must be at their workstation and ready to work at the start of their shift. Arriving or logging in late violates the attendance policy, regardless of how that time is treated under timekeeping "rounding rules." Leaving before the end of a scheduled shift also violates attendance policies. Indeed, employers tend to state so explicitly in their instructional manuals. One manual states, "If

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https://hr.vanderbilt.edu/apps/ts/RoundingProceduresEffectiveNov16-2014.pdf [https://perma.cc/8NNH-63TH].

[139] *Id.*

[140] *Id.*

[141] *Compare* 26 F.R. 195 (Jan. 11, 1961) *with* identical language in 29 C.F.R. § 785.48 (2016). The actual practice of rounding dates back even further, as the regulations refer to practices in place "for many years." 29 C.F.R. § 785.48.

you clock in up to 7 minutes after your scheduled start time, your paid time will round to your scheduled start time. You may still receive an occurrence for tardiness."[142] The manual continues, "Reminder: Each employee is expected to report to work at their scheduled time. Arriving late or leaving early may be addressed through the Attendance and Punctuality Policy."[143] Another instructional document warns, "An employee whose schedule requires him/her to be at work at 8.30AM and who clocks in after that scheduled time, is considered late regardless of the fact that the system calculate[s] hours worked for that day as if they actually clocked in at 8.30 AM…Supervisors should take disciplinary action based on **actual clock in/out times** displayed in the system."[144]

When such policies are in place, employees are likely to consistently arrive at work a few minutes early so that they are ready for work at their shift's start time. If they log in a few minutes early, however, and perform compensable work for that time, the minutes before the hour will be rounded away. Likewise, employees who are discouraged from leaving early will depart on or after the hour, and that time will also be rounded away. For employees scheduled for an eight-hour day, this disappearing time also likely qualifies as overtime, which they will not receive. What appears as a neutral rounding rule thus favors "the house." This fact is not lost on employers. Examples provided in some instructional materials have the cumulative effect of undercompensating employees for hours worked.[145] For example, the rounding depicted in Figure 14 (Appendix), taken from an employer's instruction manual, has the cumulative effect of subtracting forty-three minutes from the collective paychecks of the employees depicted.[146] When aggregated across many more employees over many pay periods, considerable cumulative wages are unpaid.

As discussed further in the next section, rounding also exploits the information asymmetry between employer and employee. Employees may not know that their timesheet is rounded. They may or may not have access to their raw time and

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[142]   VANDERBILT UNIV., *supra* note 138.

[143]   *Id.*

[144]   UNIV. OF MIAMI, *supra* note 138.

[145]   VANDERBILT UNIV., *supra* note 138.

[146]   *See* Figure 14. In Example 1, the employee worked 3 hours and 6 minutes, which was rounded down to 3 hours (loss of 6 minutes). In Example 2, the employee worked 2 hours and 12 minutes, which was rounded down to 2 hours (loss of 12 minutes). In Example 3, the employee worked 3 hours and 11 minutes, which was rounded down to 3 hours (loss of 11 minutes). In Example 4, the employee worked 3 hours and 14 minutes, which was rounded down to 3 hours (loss of 14 minutes). The cumulative effect of the rounding in the employer's example was a loss of 43 minutes.

attendance data, and so would not be in a position to identify the cumulative effect of the rounding policy on their paycheck. By contrast, employers have access to the raw data, and can model the cumulative effect of rounding versus not rounding. It seems unlikely that employers would ever choose to implement a rounding policy if it had the cumulative effect of overcompensating employees. To revisit the casino analogy, employers likely structure the rules to favor house odds. In theory, employees could challenge their systematic wage loss; a rounding practice that "result[s], over a period of time, in failure to compensate the employees properly for all the time they have actually worked" does not comply with existing DOL rules.[147] However, the only party knowledgeable as to the cumulative effect of the rounding practice is the employer.

E.   Software Architecture that Inhibits Enforcement: Data Encoding

Thus far, we have examined software features that undermine wage and hour law by tempting users to cheat. However, software can also undermine regulatory systems by interfering with the enforcement structures for those laws. In particular, software architecture that obscures data critical to enforcement separately undermines regulatory systems.

Three sets of actors have a role in wage and hour law enforcement: (i) workers, their lawyers, and expert witnesses hired for litigation; (ii) employers, their lawyers, and their own advisors and expert witnesses; and (iii) federal and state enforcement agencies. When timekeeping software lacks transparency as to whether and how workers' hours have been edited, each actor is hindered in its ability to play its enforcement role. Employees and associated parties have an interest in knowing the basis on which their pay is calculated and detecting, quantifying, and proving underpayment if it occurs. Management should be able to ensure that lower level supervisors are editing workers' hours in compliance with wage and hour law. The DOL and its state agency equivalents should be able to trace the occurrence and reason for edits to workers' time in audits or enforcement actions.

The way that data is encoded and organized has a substantial effect on whether parties other than the employer will be able to detect a wage and hour violation, and estimate the size of any such violation. In particular, it can be very difficult to distinguish legitimate from illegitimate edits without information about the reason for such edits. As illustrated in

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[147]   29 C.F.R. § 785.48(b).

Figure 7 (Appendix), some software programs prompt managers to choose a reason when changing an employee's time. In the absence of such a prompt, however, employees, employers and outside auditors and reviewers can only guess at why workers' hours were altered.

Suppose, for example, that the employer has preserved records of timecard edits, and an expert witness in the ensuing litigation finds several thousand instances of supervisor edits.[148] Suppose also that, on average, the employer added 10 minutes of time to the employee's time card over these thousands of edits. See Figure 3, below. This undifferentiated analysis suggests that the employees have not been adversely affected by wage edits.

Figure 3: Histogram of Employer Edits to Employee Timecards[149]
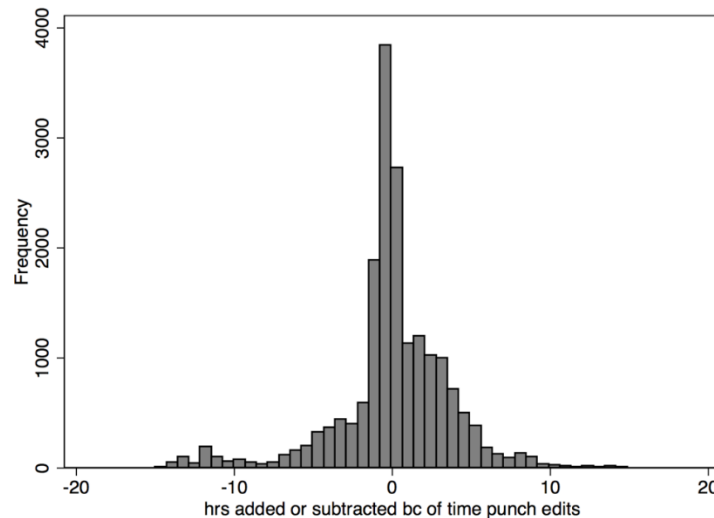
However, it is possible that an analysis that disaggregates the edits by "reason for edits" would reveal a different picture. For example, edits that were non-discretionary – such as correcting missed punches – may have had the net effect of adding time to employee timecards. By contrast, discretionary edits with more questionable justifications may have had the net effect of reducing employee time worked, and therefore reducing earned compensation. See Figure 4, below.

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[148] This example is reproduced consistent with copyright terms from Zev Eigen, *A Proposal to Improve Enforcement of the Fair Labor Standards Act*, PROCEEDINGS OF THE NEW YORK UNIVERSITY 66TH ANNUAL CONFERENCE ON LABOR 57-59, LexisNexis (2014).

[149] This Figure was originally published in Eigen, *supra* note 148.

Figure 4: Histograms of Employer Edits: Discretionary vs. Non-Discretionary[150]

hrs added or subtracted bc of time punch edits
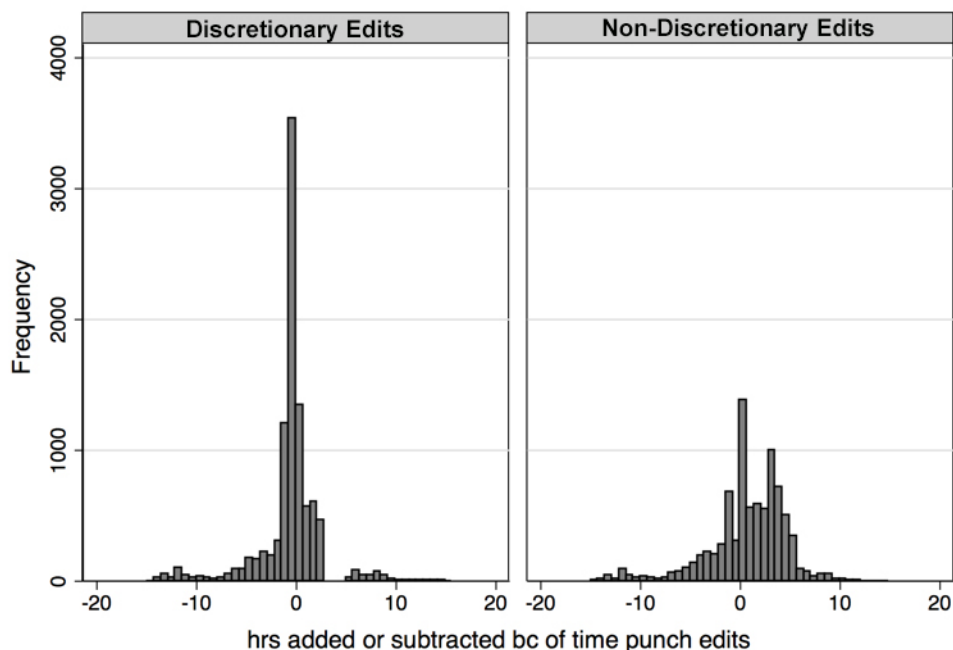
Graphs by class

The disaggregated results would not be detectable by an outside expert where the software does not prompt the supervisor to document the basis for edits. To be sure, it would seem unlikely that an employer would provide a documented reason consisting of "reducing overtime" – though the "comment" options available in Figure 7 (Appendix) suggest just that. Regardless, some information is better than no information, and supervisors making unlawful discretionary edits may have a propensity for using certain coded explanations in that case. Requiring documentation of the reasons for an edit would also serve the additional function of discouraging supervisors from making deductions without adequate justification.

Timekeeping software's lack of transparency hinders experts', the DOL's, and state agencies' ability to perform their functions in another way as well. Raw data is often maintained in a proprietary format that is unique to each particular software program. As Eigen has previously argued, this presents several challenges.[151] Although time and date data might be legible in "native format,"[152] when viewed within the confines of

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[150]   This Figure was originally published in Eigen, *supra* note 148.

[151]   *Id.* at 53-56.

[152]   "Native format" refers to the "default format of a file . . . typically provided through the software program on which it was created or through which it was viewed." *In re* Priceline.com Inc. Securities Litigation, 233 F.R.D. 88, 89 (D. Conn. 2005).

the proprietary software itself, it can become indecipherable once exported to a different software program for analysis. Dates and times are unusual types of data because they do not use the base ten decimal number system. Nevertheless, many software programs do encode times and dates as base ten numbers, converting 9:00:00 am EST on December 12, 2013 into the number 1386860400, for example.[153] The software does so by storing the date and time as the number of seconds that have elapsed since some arbitrary date in the past, known as the "epoch date." For example, Unix-based software encodes time and date information as the number of seconds elapsed since the date January 1, 1970.[154] Yet not all software programs use the same epoch date; Microsoft Excel uses midnight on January 1, 1900.[155] Thus, exporting raw time and attendance data from the proprietary program into statistical software for analysis, or even into widely used Microsoft Excel, can prove quite difficult. Much of the useful information is lost in the course of the file conversion.

A second challenge is in deciphering the meaning of the data, which may not provide any summary information explaining how each variable is encoded.[156] (See Figure 5, below). A dataset may have two variables reflecting "timein" and "timeout." From those variables, it may not be possible to decipher whether they refer to working time or break time. There is likely some third variable, e.g. "paycode" that identifies whether the timestamps refer to breaks or time worked. But if the "paycode" variable appears in the form of numbers, it is essentially impossible for an outsider to identify what those variables mean from the numbers alone.

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[153]   Eigen, *supra* note 148 at 55-57 (using this example to illustrate the Epoch date and base ten conversion problem). See *Epoch Unix Time Stamp Converter*, DAN'S TOOLS (July 2, 2016, 9:34 PM), http://www.unixtimestamp.com and *Epoch & Unix Timestamp Conversion Tools*, EPOCH CONVERTER, (July 2, 2016, 9:38 PM), http://www.epochconverter.com/ for more information about Unix's time encoding system.

[154]   Eigen, *supra* note 148 at 55.

[155]   *Id*. at 56.

[156]   A variation of this example appears in Eigen, *supra* note 148 at 52-54.

Figure 5: Raw Data from Timekeeping Software[157]

	store	employee	dept	job	timein	timeout	paycode1	hours1	paycode2
1	ABC	12345	GenCo dept x	94	04apr2008 08:51:00	04apr2008 21:06:00	100	8	300
2	ABC	12345	GenCo dept x	94	06apr2008 11:28:00	06apr2008 18:04:00	100	6.6	
3	ABC	12345	GenCo dept x	94	11apr2008 08:42:59	11apr2008 14:22:00	100	5.6	
4	ABC	12345	GenCo dept x	94	11apr2008 14:42:00	11apr2008 21:14:59	100	2.4	300
5	ABC	12345	GenCo dept x	61	04apr2008 09:00:00	04apr2008 14:53:00	100	5.8	
6	ABC	12345	GenCo dept x	61	04apr2008 15:20:59	04apr2008 17:54:00	100	2.2	300
7	ABC	12345	GenCo dept x	61	11apr2008 08:55:00	11apr2008 13:44:59	100	4.8	
8	ABC	12345	GenCo dept x	61	11apr2008 14:19:00	11apr2008 17:37:00	100	3.2	300
9	ABC	12345	GenCo dept x	92	03apr2008 09:00:00	03apr2008 15:01:00	100	6	
10	ABC	12345	GenCo dept x	92	03apr2008 15:27:59	03apr2008 21:20:00	100	2	300
11	ABC	12345	GenCo dept x	92	07apr2008 08:51:00	07apr2008 13:05:00	100	4.2	
12	ABC	12345	GenCo dept x	92	07apr2008 13:34:59	07apr2008 21:30:59	100	3.8	300
13	ABC	12345	GenCo dept x	92	08apr2008 09:01:00	08apr2008 13:11:00	100	4.1	
14	ABC	12345	GenCo dept x	92	08apr2008 13:34:59	08apr2008 21:14:59	100	3.9	300
15	ABC	12345	GenCo dept x	92	09apr2008 08:55:59	09apr2008 12:24:00	100	3.5	
16	ABC	12345	GenCo dept x	92	09apr2008 12:56:00	09apr2008 21:14:00	100	4.5	300
17	ABC	12345	GenCo dept x	94	05apr2008 09:10:00	05apr2008 12:11:59	100	3.1	
18	ABC	12345	GenCo dept x	94	05apr2008 12:48:00	05apr2008 19:21:59	100	2.8	300
19	ABC	12345	GenCo dept x	94	10apr2008 09:04:00	10apr2008 13:09:59	100	4.1	
20	ABC	12345	GenCo dept x	94	10apr2008 13:46:00	10apr2008 17:53:00	100	3.9	300
21	ABC	12345	GenCo dept x	94	10apr2008 18:14:00	10apr2008 21:01:59		0	300
22	ABC	12345	GenCo dept x	Y4	12apr2008 11:31:00	12apr2008 14:06:59	100	2.6	
23	ABC	12345	GenCo dept x	Y4	12apr2008 14:32:59	12apr2008 18:01:59	100	3.5	

For the data to be meaningful, the data output would need to include a codebook that explains each variable.[158] For data entries that are shorthand for categories (for example, paycode "200"), the codebook would explain that paycode "200" refers to break times. However, existing timekeeping software is typically not structured to export such information. It is possible, for example, that the employer typed "200" in the paycode field directly in the software, and that documentation resides in the employer's files somewhere. More likely, paycode "200" is associated with "break times" within the software, but that information is not exported along with the raw data. When this problem is reproduced for every variable across millions of rows,

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157   This Figure was originally published in Eigen, *supra* note 148.

158   A codebook is similar to, but distinct from "metadata," which is information about the file that is automatically generated by the software (for example, the file creation date). Metadata refers to "information about the document or file that is recorded by the computer to assist the computer and often the user in storing and retrieving the document or file at a later date…such information includes file designation, create and edit dates, authorship, comments and edit history." The Sedona Conference, *The Sedona Principles: Best Practices, Recommendations & Principles for Addressing Electronic Document Production*, 5 SEDONA CONF. J. 151, 155 (2004). While metadata relates to information about an entire file, a codebook provides information about individual variables. *See How to Use a Codebook*, PRINCETON UNIVERSITY LIBRARY http://dss.princeton.edu/online_help/analysis/codebook.htm [https://perma.cc/A3W6-746Z] (last visited Nov. 28, 2016) ("A codebook is a technical description of the data that was collected for a particular purpose. It describes how the data are arranged in the computer file or files, what the various numbers and letters mean, and any special instructions on how to use the data properly.").

the data becomes functionally unintelligible to even a sophisticated expert in litigation.[159]

In summary, timekeeping software in Category A offers several different types of functionality that undermine substantive wage and hour laws—by making it practically and ethically easy for supervisors to shave time, by enabling employers to formulate software rules that systematically favor the employer, and by making such malfeasance more difficult to detect. However, software makers are not solely to blame for software offerings that undermine law, nor are the employers that select Category A over Category B software. As cyberlaw scholars have argued, the relationship between law and software is recursive.[160] As we discuss in Part V below, the same software that undermines legal rules is also an outgrowth of those rules.

V. THE INFLUENCE OF RECORDKEEPING RULES ON SOFTWARE DESIGN

In one view, timekeeping software exists within a market-driven ecosystem where employers demand ever more complex (and questionable) features, and software makers compete to provide them. However, the software market is also constrained by legal rules about how employer time records are kept and maintained. As we explain in greater detail below, Category A software is made possible by DOL recordkeeping rules that place very few constraints on how employers maintain records. The Department of Defense contracting audit guidelines represent a useful counterpoint to the DOL recordkeeping rules. Although they do not impose formal rules, they specify types of recordkeeping processes that the DOD considers suspicious, which then encouraged the development of Category B software.

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[159] Eigen, *supra* note 148 at 53-54.

[160] Wagner, *supra* note 104, at 461 ("lurking in the background of much recent work that accepts as true the code-is-law proviso is the question of the relationship: how, exactly, does regulation-by-software compare to regulation-by-law, and how do the two interact?") Lessig also examined the recursive relationship between code and law in *Code*. Lessig, *supra* note 104.

A. Gaps in The FLSA's Recordkeeping Requirements

Section 211(c) of the FLSA requires an employer to "make, keep, and preserve such records of the persons employed by him and of the wages, hours, and other conditions and practices of employment maintained by him, and shall preserve such records for such period of time, and shall make such reports therefrom to the [Department of Labor]."[161] The DOL, in turn, has issued implementing regulations, which were last updated in 1987. The regulations provide employers considerable latitude regarding record keeping. They expressly permit employers to create and retain records in any order or form.[162] They mandate only that the employer "maintain and preserve" certain types of information, including: "hours worked each workday and total hours worked each workweek…[and] total additions to or deductions from wages paid each pay period including employee purchase orders or wage assignments."[163] The regulations also require that employers "preserve" payroll records for three years,[164] and "basic time and earning cards or sheets on which are entered the daily starting and stopping time of individual employees" for two years.[165] These records must be made available for "inspection and transcription" by the DOL.[166] Employers must also provide "extension, recompilation, or transcription" of the records to the DOL on request.[167]

Because the DOL recordkeeping regulations have not been amended since 1987,[168] they do not address the possibility that employees' time and attendance records might be easily altered and obscured via timekeeping software. Specifically, the regulations fail to require a record of changes, with explanations, to employees' raw timekeeping data and fail to require that data be available in an accessible format.

Indeed, the regulations' text, which continues to refer to employers' use of "microfilm" and "basic time and earnings cards," suggests that regulators were not even considering the possibility that records of employees' hours worked could or

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[161] 29 U.S.C. § 211(c) (2012).
[162] 29 C.F.R. § 516.1(a) (2016) (providing that "[n]o particular order or form of records is prescribed.").
[163] 29 C.F.R. § 516.2(a) (2016).
[164] 29 C.F.R. § 516.5(a) (2016).
[165] 29 C.F.R. § 516.6(a)(1) (2016).
[166] 29 C.F.R. § 516.7(b) (2016).
[167] 29 C.F.R. § 516.8 (2016).
[168] *See* Fair Labor Standards Act; Records to be Kept by Employers, 52 Fed. Reg. 24894 (July 1, 1987) (to be codified at 29 C.F.R. § 516).

would be altered. While the regulations require that employers "maintain and preserve records" regarding "[t]otal additions to or deductions from wages paid each pay period including employee purchase orders or wage assignments,"[169] the reference to "purchase orders" and "wage assignments" suggests that the alterations at issue were deductions from workers' paychecks rather than edits to their hours. The regulations later refer to these deductions as "items" whose "nature" must be documented.[170] The reference to "items" dates as far back as the 1941 version of the recordkeeping regulations, which provide examples of deductions from workers' wages for items such as "coal," "groceries," "meat," and "rent."[171] Had the DOL been referring to hours adjustments, it presumably would have demanded that the employer document the "reason" for rather than the "nature" of the deduction.

The regulations' failure to adequately address timesheet modifications is evidenced further in another provision, which requires employers to document changes to a timesheet only in certain limited circumstances. Where employees work a fixed schedule, and the employer uses that fixed schedule as a "default" timesheet, the employer must manually affirm "by check mark, statement or other method that such hours were in fact work[ed]" or else modify the sheet with the "exact number of hours worked" if the schedule deviates.[172] Yet as demonstrated in the previous Part, there are numerous other circumstances in which an employer might edit an employee's hours, including shifting hours from one workweek to another and shaving minutes to avoid overtime. Such edits can result in FLSA violations, and are enabled by features of timekeeping software, but escape the reach of the FLSA's recordkeeping regulations as written.

In the absence of adequate regulatory guidance, the DOL and some courts have taken the position that any modifications to time cards render them inaccurate, and therefore non-compliant.[173] Yet such an approach is unhelpful, as it underestimates the inevitability of employer edits to raw

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[169] 29 C.F.R. § 516.2(a) (2016).

[170] *Id.*

[171] Records to be Kept by Employers Pursuant to Section 11 (c) of the Fair Labor Standards Act of 1938, 6 Fed. Reg. 4695 (Sept. 13, 1941) (to be codified at 29 C.F.R. § 516).

[172] Solis v. La Familia Corp., 90 FED. R. EVID. Serv. 920, No. 10-CV-2400-EFM-GLR, 2013 WL 589613, at *7 (D. Kan. Feb. 14, 2013) ("when employees work a fixed schedule, the employer must maintain records of any deviation from this schedule"); 29 C.F.R. § 516.2(c).

[173] Solis v. Supporting Hands, LLC, No. CIV 11-0406, 2013 WL 1897822, at * 23 (D.N.M. Apr. 30, 2013) (collecting cases).

timekeeping data. Raw data does not faithfully reflect actual hours worked in every case, because humans interact with automated systems in various purposeful and inadvertent ways.[174] Employee hours are tracked through a myriad of electronic means, such as an RFID card scan at a workstation or cell phone or computer log-ons.[175] An employee RFID tag that measures her arrival and departure from the building may overstate the employee's working time to the extent the employee is engaged in non-compensable preliminary and post-work activities,[176] or visiting the worksite for non-work reasons. Employees may forget to punch in or punch out of their workstation. Thus, a blanket rule that alterations to raw data are necessarily illegitimate is unrealistic and unworkable; updated regulations providing for employee notification or access to supervisor edits would do a better job of protecting workers without limiting the employer's ability to make corrections.

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[174] An employee's RFID tag that measures his/her arrival and departure from the building may overstate the employee's working time to the extent the employee is engaged in non-compensable preliminary and post-work activities. *See* Integrity Staffing Sols., Inc., 135 S. Ct. 513, 518 (2014) (declaring security screenings noncompensable postliminary activities); Sandifer v. U.S. Steel Corp., 134 S.Ct. 870, 879 (2014) (compensability of donning and doffing clothes appropriately handled through collective bargaining); Kuebel v. Black & Decker, 643 F.3d 352, 358-59 (2d Cir. 2011) (non-compensability of commuting time even when preceded by administrative activities). *See also* Portal to Portal Act, 29 U.S.C. § 251 (West 2016); 29 C.F.R. §§ 790.7-790.8 (West 2016). Likewise, other timekeeping methodologies can produce raw data that incorporates a supervisor's modification of employee work time. Just as a supervisor can direct an employee using paper time sheets not to record overtime hours worked, so too could a supervisor instruct employees to "log out" of a work station before the employee finishes working. *See supra* note 109. Similarly, a system that requires the supervisor's credentials to log the employee in and out of her shift is vulnerable to the supervisor's manipulation of working time. *See generally* Kutzback v. LMS Intellibound, LLC, No. 2:13-cv-2767, 2014 WL 7187006 at *1 (W.D. Tenn. Dec. 16, 2014) (alleging that managers "systematically and consistently clocked-out [employees] while still working, resulting in off-the-clock hours worked"); Porcal v. Ciuffo, No. 10-cv-40016, 2013 WL 3989668 at *2 (D. Mass. Aug. 1, 2013) (employee alleged off-the-clock work where supervisors "record[ed] and report[ed] the number of hours that employees worked on job sites"); Alvarez v. AMB-Trans, Inc., No. SA-11-CV-179, 2012 WL 5453518 at *3 (W.D. Tex. Nov. 7, 2012) (wage and hour claim alleging off-the-clock work were dispatchers were responsible for "clocking in" emergency medical technicians).

[175] *See supra* note 2.

[176] *Integrity Staffing Sols.*, 135 S. Ct. at 518 (declaring security screenings noncompensable postliminary activities); *Sandifer*, 134 S. Ct. at 870 (compensability of donning and doffing clothes appropriately handled through collective bargaining); *Kuebel*, 643 F.3d 352 (non-compensability of commuting time even when preceded by administrative activities). *See also* Portal to Portal Act, 29 U.S.C. § 251 (2012); 29 C.F.R. §§ 790.7-790.8 (2016).

Beyond the federal FLSA requirements, state wage and hour laws may impose additional record keeping requirements.[177] These rules tend to specify the type of information to be disclosed to the employee upon hire,[178] the information to be included on an employee's pay stub,[179] and the type of information to be maintained and preserved.[180] These are often formulated similarly to the federal regulations, requiring that the records be "true and accurate" and that they include hours worked, deductions, and net wages. Some state wage theft prevention laws have sought to impose more stringent record keeping practices, but do not seem to address the specific challenges and complexities of maintaining and accessing electronic records. For example, New York now requires that employers keep "contemporaneous" records,"[181] which appears designed to send the message that employers cannot simply fabricate records after the fact.[182] Like the FLSA, it does not provide express guidance on how modifications to employee time records should be handled, instead merely opining that the ultimate records should be "true and accurate."

B. An Alternative Regulatory Environment: DOD Audit Standards

This Part examines an alternative set of regulations: rules promulgated by the U.S. Department of Defense that govern timekeeping and wage payment for federal contractors. These regulations solve many of the problems of the FLSA recordkeeping regime identified above.

The Department of Defense issues Federal Acquisition Regulations that apply to contracting entities.[183] These regulations are somewhat similar to the DOL's FLSA recordkeeping regulations described in the previous Section. They require contractors to preserve for three years records showing "daily and weekly number of hours worked, deductions made, and actual wages paid."[184] Like the DOL regulations, the DOD rules require this information to be available for inspection, on penalty of payment suspension or debarment.[185]

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[177] *See, e.g.*, N.Y Lab.. Law § 195 (McKinney 2016).

[178] *Id.*; Cal. Lab. Code § 2810.5 (West 2015).

[179] N.Y. Lab. Law § 195; Cal. Lab. Code § 212; Mass. General Law. Ch 149 § 148.

[180] Cal. Lab. Code § 1174; Mass Gen. Law Ch 151 § 15; Minn. Stat. § 177.30.

[181] New York Lab. Law § 195.

[182] Lauren Dasse, *Wage Theft in New York: The Wage Theft Prevention Act As a Counter to An Endemic Problem*, 16 CUNY L. REV. 97, 117 (2013).

[183] 48 C.F.R. § 52.222-8.

[184] *Id.*

[185] *Id.*

Unlike under the DOL regulations, contractors must submit weekly payroll records to the DOD, along with a signed statement that the information is "correct and complete" and that each "laborer or mechanic…has been paid the full weekly wages earned without rebate." Submission of a false verification "may subject the Contractor or subcontractor to civil or criminal prosecution."[186] While the DOD regulations are more punitive and require direct submission of records to the DOD, they do not depart substantially from DOL regulations in the form of recordkeeping imposed on employers.

The substantive departure from the DOL regulations arises from the Defense Contract Audit Agency Manual (the "Manual"), which is intended "to provide technical audit guidance, audit techniques, audit standards, and technical policies and procedures" for DOD audit staff.[187] The Manual describes its purpose as "instructive" and advises readers not to reference the Manual in audit reports or correspondence with other agencies.[188] Although the audience for the Manual is not necessarily employers and the software makers that cater to their needs, the Manual is available publicly and influences employer record keeping practices and software within that market.

In stark contrast to the FLSA regime, the Manual's primary focus is on internal controls[189] within the timekeeping system: whether the employer maintains "procedures…adequate to maintain the integrity of the Timekeeping System."[190] It describes different types of measures for "manual" versus "automated" timekeeping systems, but either must include

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186   *Id.*
187   DCAA MANUAL, *supra* note 22, at 0-001.
188   *Id.*
189   "Internal controls" is an accounting term referring to "a process…designed to provide reasonable assurance regarding the achievement of objectives relating to operations, reporting, and compliance." Committee of Sponsoring Organizations of the Treadway Commission, INTERNAL CONTROL – INTEGRATED FRAMEWORK (May 2013), www.coso.org/documents/internal%20control-integrated%20framework.pdf [https://perma.cc/B4AS-JHVS]. They typically involve procedures designed to ensure the integrity of the company's accounting and finances, such as systems for authorizing and approving expenses, segregating duties, monitoring activities, or internal and external communications. *Id.* at 6-7. An example of "segregating duties" might be assigning different departments to authorize, record, and handle an asset to reduce the risk of fraud. Vanderbilt University Office of Internal Audit and Institutional Risk Management, *Are there Different Types of Internal Controls?* https://www4.vanderbilt.edu/internalaudit/internal-control-guide/different-types.php [https://perma.cc/S9BU-2T88] (Sept 7, 2016).
190   DCAA MANUAL, *supra* note 22, at 5-909.

"appropriate controls to ensure corrections to labor records are accurate and authorized."[191] For manual timekeeping systems, the auditor is instructed to review whether the employer (1) gives employees possession of their timecard, (2) instructs them to complete such timecard daily, in ink, as work is performed; (3) ensures that hours are not recorded in advance, and (4) supervises employee arrival and departure to "prevent improper clock-in/clock out."[192] The Manual advises that any "corrections" to a paper timesheet be made in ink, be initialed by the employee, and include a "sufficient and relevant explanation for the correction."[193] Both supervisor and employee should sign the record.[194] The combined effect of this set of controls is that they limit employer opportunities to modify the timesheet without the knowledge of the employee. If the employer wants to make an after-the-fact correction, it can either disclose that to the employee, who must initial it, or it can make a correction without the employee's initials, for the auditor to later discover. Certainly the employer could try to manipulate employee timekeeping in other ways[195]—such as instructing employees to enter inaccurate information onto the timesheet—but at least that form of non-compliance would be known to the employee.

The Manual advises auditors to look for a parallel set of procedural standards within automated timekeeping systems. First, the system should be structured so that "only the employee uses their labor charging instrument to access the labor system" and controls should be in place to ensure that employee credentials are not duplicated or issued to others. Likewise, procedures should be in place whereby "changes are initialed, authorized, and dated by the employee and supervisor, and include a description of the reason for the change. This may be done electronically."[196] Additionally, the automated process should produce "a verifiable audit trail…that collects all initial entries and subsequent changes."[197] Like the procedures applicable to manual timekeeping, the rules limit the employer's opportunity to modify the timecard without the employee's knowledge.

This portion of the Manual is not lengthy—the above-quoted provisions occupy about one page. However, its focus on internal controls is much more effective in encouraging compliance, protecting employees' substantive wage and hour rights, and

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191   *Id.*

192   *Id.* at 5-909.1.

193   *Id.*

194   *Id.*

195   *See supra* note 174.

196   DCAA MANUAL, *supra* note 22 at 5-909.2.

197   *Id. See also id.* at 5-911.6 (Records Retention).

potentially limiting employers' liability risk than the DOL's outdated approach. Employers are less likely to make changes to an employee timecard when they know that it will be reviewed by the employee, and potentially an auditor. Another critical component of the DOD system is that the consequences for procedural lapses—separate and apart from the substantive violations—are potentially quite severe, and could include contract termination, fines, debarment, or criminal penalties.[198] Consequently, contractors have an incentive to take these procedural duties seriously.

The examples of Category B software discussed in previous Parts are almost always marketed as "DCAA compliant," referring to the Defense Contract Audit Agency Manual. This software includes none of the "features" that can undermine wage and hour law that are prevalent in the Category A examples described above. DCAA compliant software does not look and feel uniform—the DCAA does not compel employers to adopt particular practices; rather, DOD audits scrutinize the employer's procedures. This provides software makers the freedom to build out the functionality in different ways. For example, at least one such software provider has a mobile app that allows employees to use their mobile devices to log in and out.[199]

The most significant difference between DCAA-based software and other types of software is that it is structured to discourage, rather than facilitate, edits to the raw data. It functions essentially as a "trusted system" – meaning software architecture that anticipates and prevents misuse by individual users.[200] A "trusted system" in the digital music context might prevent users from copying a music file.[201] In the timekeeping software context, a "trusted system" limits the supervisor's ability to make edits to a timecard without the knowledge of

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[198] U.S. v. Maher, 582 F.2d 842 (1978) (criminal conviction under False Claims Act, 18 U.S.C. § 287, for inflating labor costs in government contracts); DCAA MANUAL, *supra* note 22 at 5-907; 18 USC § 1001 (criminal penalties); James Graham, *Mischarging: A Contract Cost Dispute or a Criminal Fraud?*, 15 PUB. CONT. L. J. 208, 234 (describing applicable federal fraud and false claims statutes, and other remedies, including restitution, suspension, debarment). Typically, allegations of "mischarging" in the government contracting context involve inflating rather than shaving employee hours. *Id.* at 209. An affirmative defense is available where the government was not financially harmed by the "mischarging." *Id.* at 230. Nevertheless, anti-fraud protection intended to protect the government from overbilling produces a positive externality by protecting employees from wage theft.

[199] WEWORKED, https://www.weworked.com/ [https://perma.cc/S3DF-LTWB] (last visited July 10, 2016).

[200] *See supra* note 15.

[201] Zittrain, *What the Publisher Can Teach the Patient, supra* note 15, at 1215.

individual employees. While Category A software offers multiple opportunities for the supervisor to modify raw timesheet data, Category B software permits only the employee to make edits.[202] The DCAA-based software presumes that the raw data is the most reliable source of information, whereas mainstream software treats the same information as a rough draft, subject to further revision and refinement by the employer and its rules. And as behavioral compliance theory teaches, such a system likely provides the means and opportunity for cheating.

Certainly, one could argue that DCAA-based software is inefficient, due to the difficulty of making edits to the raw data. However, one DCAA-based software maker estimated that fewer than five percent of employee timesheets are modified by users.[203] Supervisors accustomed to making multiple corrections to employee timesheets in a Category A setting may also treat employee timekeeping behavior as fixed—entering missing time punches for those employees because these corrections are easier than requiring the employee to correct the error. Yet within a different software structure that forces employees to account for and fix mistakes, employees may be obligated to adapt (or face discipline if not). The more cumbersome edit protocol in DCAA-based timekeeping software may therefore ultimately save employer time and effort, as both managers and employees work harder to ensure the reliability of the underlying raw data.

VI. RECOMMENDATIONS FOR THE DEPARTMENT OF LABOR

Our recommendations below seek to balance multiple competing factors. First, employees deserve to be paid wages to which they are entitled under the applicable wage and hour laws. Second, employers have a legitimate interest in efficiently handling timekeeping and payroll processes. Third, regulations should not foreclose or limit future software innovations that may add value for employees and/or employers.

Our recommendations also make several assumptions. First, we assume that software makers will adapt to new rules

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[202] The timesheet is then returned to the employee for correction or further discussion. Of course, the system does not prevent supervisors from unlawfully instructing employees to remove time worked from their timesheets. However, such changes at least involve the employee, so the employee is aware of the lost time and can bring a claim. In that respect, an employee using DCAA-based software is better positioned than one whose employer is making edits without the employee's knowledge.

[203] BigTime, *Enterprise DCAA Audit Log*, YOUTUBE (July 10, 2016) https://www.youtube.com/watch?v=YEApsT8TARg.

much faster than rulemakers can respond. [204] This assumption is realistic and reasonable given the rapidity with which software has evolved and the regulators' comparative slowness in implementing changes, in part due to extreme political gridlock. New rules must be sufficiently robust to remain useful following such adaptation. Second, we assume that the way software is actually used is equally as important as its design.[205] Put another way, we assume the key design adage that "form follows function." Third, we place the locus of responsibility for software choices on the employer, not on the software maker. It is, for example, possible to imagine a regulatory regime that regulates software makers directly or that imposes third party liability on the software maker. This is a fundamental choice in regulatory design that spans many areas including those well beyond the scope of this article. However, the existing regulatory regime makes employers solely responsible for recordkeeping violations. We assume that will continue to be the case. In other words, we formulate our recommendations based on real-world constraints and in line with what would render the recommendations most likely to be acceptable and implementable.

A. *Improve Data Transparency*

As Cynthia Estlund and others have observed, disclosure is a relatively underused regulatory tool in employment law.[206] The information available to employers about how timecards are manipulated should be available to affected individual employees, and should be decipherable to outside experts in the course of litigation or an audit.[207] With that in mind, we recommend the following transparency related measures.

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[204] *See* LAWRENCE LESSIG, CODE: VERSION 2.0 6 (2d ed. 2006); Wagner, *supra* note 104; Wu*, supra* note 82;

[205] In the words of Cass Sunstein, "choice architecture is inevitable. Human beings cannot wish it away. Any store, real or online, must have a design; some products are seen first, and others are not. Any menu places options at various locations . . . A website has a design, which will affect what and whether people will choose." THE ETHICS OF INFLUENCE, *supra* note 102, at 35.

[206] Cynthia Estlund, *Just the Facts: The Case for Workplace Transparency,* 63 STAN. L. REV. 351, 352 (2012).

[207] Cass Sunstein draws a distinction between "summary disclosure" and "full disclosure" as regulatory tools. "Summary disclosure" refers to providing easily understood information provided in short form that helps people make decisions (e.g. a nutrition fact label), while full disclosure typically refers to information provided on the internet for analysis by third parties (e.g. data about flight delays). SIMPLER, *supra* note 100, at 77-79. We envision requiring employers to provide summary form information to employees, while making full disclosure information available to experts in the course of an audit or litigation.

1. Provide Hourly Workers Access to Their Timesheets including Modifications Made to Timesheets by their Employers.

The DOL should revise its recordkeeping regulations to require that employers provide hourly employees with access to their own electronic timecards. This access should include disclosure or notification of edits made to those timecards.[208] This requirement would serve employees, who would be better equipped to advocate for their rights with access to such information. It would also discourage supervisors from making illegitimate edits because they would face the possibility of an uncomfortable conversation with an employee or HR. Such a requirement would also serve well-intentioned employers by providing a form of early detection for wage and hour violations. A senior executive would much rather deal with a low level supervisor who was caught making a few illegitimate edits to a timecard, than an extremely costly and resource-consuming wage and hour class or collective action involving multiple supervisors over a lengthy period of time.

2. Require Employers to Document the Reason for Edits to Employees' Hours Worked.

The DOL should require employers to document the reason for each timecard edit, and disclose them to affected employees. Such documentation could be as simple as choosing from a drop down menu of choices. The rules also would permit batch edits with an associated justification – for example, correcting a mistake made by the login software for multiple employees at once.

Requiring the employer to document a reason serves multiple function. First, it imposes a small transaction cost on the employer for making edits and encourages them to adopt more accurate time tracking systems that require fewer corrections. Second, it augments transparency to individuals affected by the edit about whether or not the edit was legitimate. Third, it discourages illegitimate edits by the supervisor. Fourth, it makes the data easier to interpret by an expert after the fact. Whether that expert is an auditor, a government inspector, or an outside expert hired by a plaintiff or the employer, all parties benefit from more transparent data. A plaintiff's expert can more easily determine whether a claim is valid, enabling all parties to settle more quickly. The employer's expert – or the employer itself – might be better positioned to identify a pattern of problematic edits early on. Likewise, an

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[208]   *See* Eigen, *supra* note 148 at 42, 62.

auditor or investigator can end an audit or investigation more quickly when better data is available.

3. Employers Should Be Able to Produce a Report of all Automated "Rules" Applied to Time and Attendance Data.

The DOL should require employers to be able to produce a report that describes all of the automated "rules" that are applied to employee timecards. An auditor – or other outside expert – should be able to request such a report, and use it to easily assess whether the rule itself complies with applicable law, and whether it aligns with the employer's actual practices around breaks, rounding, or other workplace practices. Existing software already tracks the use of those rules in order to implement them. Software functionality summarizing those rules would not be a drastic technological departure, although some investment may be required to summarize them in plain language. Likewise, employees should have access to information, in simple language, about the automatic rules applied to their paycheck. For example, employees should be able to see that a break was automatically deducted from their time worked on a given date, at a given time.

4. Employers Should Be Able to Produce a Codebook for Timekeeping Data.

The DOL should require that employers be able to produce a codebook that defines each of the variables that appear in its timekeeping software output. For example, suppose certain entries in the data represent raw data, and edits to the raw data. The codebook should define the variable distinguishing between raw and edited data – for example, identifying that the variable called "Raw" refers to whether the data is raw or edited, and that the value 0 = raw, and 1 = edited. The codebook should also define the variables associated with the reason for the edits—for example, the variable "Reason" might refer to the reason assigned to the edit, and 1 = vacation, 2 = machine malfunction, 3 = missed punch, etc. This information is already stored somewhere within the program. However, not all programs make this information readily accessible or decipherable to anyone other than the administrator who originally established the rules within the system. Most software can be readily designed to produce a codebook that can be read by common statistics packages such as Stata, SPSS, or SAS.

5. Employers Should Be Able to Specify Output Formats for Timekeeping Data.

The DOL should require that employers use software that allows the user to specify the form in which timekeeping data will be exported to the data recipient. An expert – whether it be an auditor, or outside expert hired by the plaintiff or defendant – should be able to receive the data in a format compatible with statistical analysis software. This question is computationally easy for the software – and is analogous to options visible in Microsoft Excel for encoding data in "tab delimited" or "comma delimited" form. In addition, the recipient of the data should be able to request an output format in base ten with reference to a specific epoch date.   Currently, software makers have no incentive to produce software that can be readily exported to software packages other than payroll software. This imposes an externality on employers, who do not know to demand such capability of their software providers until it is too late,[209] as well as government regulators and outside experts. This requirement alone would eliminate substantial transaction costs that increase the time and duration of litigation.

B.   Scrutinize the Employer's Processes for Maintaining the Integrity of Time Records.

Existing recordkeeping rules, and related case law, already require that the employer keep "accurate" records.[210] However, the DOL's assessment of accuracy is a binary one – are the records accurate or not? Employers whose records are deemed "inaccurate" are heavily penalized in litigation through adverse evidentiary inferences and the potential imposition of liquidated (double) damages.[211] Employers meeting the "accuracy" threshold escape further scrutiny of the systems used to record and modify their employees' time records.

This system offers little in the way of predictability for employers, nor does it incentivize them to implement better timekeeping practices. No timekeeping system will produce completely accurate results, just as no accounting system produces a completely accurate picture of the financial state of a company. Every timekeeping system produces some error, and

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[209] Employers, like the rest of us, may suffer from a problem known as "comparison friction," which is the idea that choosing among complex products is difficult. SIMPLER, *supra* note 100, at 81. An employer's choice regarding which software to purchase – and indeed, which configuration package of that software – is exceedingly complex. So much so that Kronos wrote a 32 page "guide" for selecting timekeeping software. KRONOS, *supra* note 66. The abstruse question of whether output from a particular software package is compatible with statistics software almost certainly fails to rank among the metrics employers consider in their purchasing decisions.

[210] *See supra* note 7.

[211] *See supra* note 20.

is vulnerable to some cheating. However, like an audit of a company's accounting practices, the relevant question should be whether the employer has adopted systems that minimize errors and cheating – that send the correct situational cues and encourage the correct behaviors to achieve the highest possible level of compliance.

The system of rules and audit guidelines adopted by the Department of Defense offers a much better approach than do the DOL's weak, outdated recordkeeping provisions – one that focuses on the *processes* adopted by the employer rather than some unattainable, binary substantive idea of "accuracy." The DOD does not mandate that an employer keep time in a particular way. However, it identifies systems that are more vulnerable to manipulation – such as those that provide supervisors with unfettered timekeeping modification rights without notice or input from the employee. When an employer has adopted a weak system, the DOD subjects that employer's practices to greater scrutiny in the course of an audit.

We recommend that the DOL take a similar approach in its Field Operations Handbook. Although other parts of the Handbook have been revised recently, most of the chapter on recordkeeping has not been updated since 1988.[212] Like the DOD's Audit Manual, the Handbook should advise auditors to focus on whether an employer has adopted *processes* to maintain the accuracy of the records.[213] In addition to the recommendations in the previous section, such processes might include whether the employer:

- Provides a mechanism for employees to challenge or question timecard edits. (For example, an employee might be provided a button that says "Dispute this edit" or "Ask a question about this edit.")
- Provides an accessible means for an employee to override an automatic break or meal period deduction where no such break or meal period was taken.[214]

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[212] Department of Labor, *Field Operations Handbook*, Chapter 30 ("Records, Minimum Wage, and Payment of Wages"), https://www.dol.gov/Whd/FOH/index.htm [https://perma.cc/NB27-S7XU]. The version currently available on the website includes a table of contents for Chapter 30 that was updated in 2000. However, the substance of that chapter dates back to 1988, with the exception of a 2000 update relating to mileage rates, and deductions in non-overtime weeks.

[213] As Orly Lobel and On Amir observe, "In order to apply behavioral economics insights effectively, there must be a continuous study as to whether the chosen design attains its intended effect, both at the micro and macro levels." Lobel & Amir, *supra* note 115 at 2123.

[214] Berger v. The Cleveland Clinic Found., No. 1:05 CV 1508, 2007 WL 2902907 at *13 (N.D. Ohio, Sept. 29, 2007).

- Adopts procedures through which HR or legal counsel reviews usage patterns for certain software features vulnerable to illegal use, and follows up on suspicious patterns.

The presence of such processes would weigh in favor of an "accuracy" determination by the DOL, while their absence may justify further scrutiny of the employer's modifications to employee time records.

The DOL should also credit employers for implementing software features that discourage noncompliant behavior and encourage compliant behavior. Such software features might include:

- Periodic reminders to supervisors—before reviewing timecards—that altering an employee's timecard is dishonest.[215]
- Displays that show the amount of an employee's paycheck that is reduced by the timecard edits, to remind supervisors that they are altering an employee's take home pay in dollars, not merely in hours.
- Terminology for software functionality that is consistent with legitimate rather than illegitimate uses. For example, software could use the term "correction" rather than "edit," or the term "report" or "review" rather than "reconcile."
- Edit interfaces that do not suggest that the raw data is deleted. Edits could appear in a log, rather than replacing the original entry in the graphic interface. Alternatively, edits could appear like "tracked changes," or the original entry could appear separately in lighter font. This serves as a visual reminder to the supervisor that any malfeasance can later be identified and traced to him or her.
- Warning boxes to supervisors about impermissible uses of certain software functionality – for example, a warning to supervisors reviewing an overtime report

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[215] *See, e.g.*, Langevoort, *supra* note 13 (discussing the ways in which warnings before an action rather than after are more effective in ensuring an ethical choice with respect to that action); Nina Mazar, On Amir & Dan Ariely, *The Dishonesty of Honest People: A Theory of Self-Concept Maintenance*, 45 J. OF MARKETING RESEARCH 633, 636 (2008) (cheating eliminated when participants recalled Ten Commandments before performing task); Shu, Gino & Bazerman, *supra* note 93, at 232 ("One answer to reducing unethicality is that simply drawing people's attention to moral standards drastically reduces dishonest behaviors").

that it is illegal to decline to pay for overtime hours already worked.

Conversely, certain practices that erode the integrity of the employer's records would trigger further inquiry by the DOL. These might include:

- The implementation of software features whose illegitimate use predominates over possible legitimate uses. These include, for example, a "carry forward hours" feature.
- Choice architecture that offers supervisors an illegal "option," even if it is one choice among many. One such example is letting supervisors decide whether they want to pay "all" "some" or "no" overtime for hours worked.
- The implementation of software rules that differ dramatically from the employer's actual practices. An example would be the use of an auto-break deduction in a workplace where employees are rarely afforded the opportunity to take a break.
- Strong pressure from the organization for first line managers to control payroll costs, and performance metrics based in part on controlling payroll costs, where first line managers are responsible for reviewing, and authorized to make edits to, employee time cards.[216]

C. Prohibit Rounding.

Regulations authorizing rounding are a vestige of a pre-digital age. Rounding rules made sense before the invention of software that can track and record time in *milliseconds.* Indeed, rounding made sense when it was costly for employers to invest in any tracking system whatsoever. In 1938, the year the FLSA was passed, many employers likely tracked employee time by human observation. It is important to note this because the law needed to harmonize with both economic concerns about the regulation of work and legitimate concerns about fairness. As the ability of employers (even small ones) to more accurately record employees' time has clearly changed since 1938, the laws have fallen far behind. Category A timekeeping software lives in the gap between the 1938 statute, the 1987 recordkeeping regulations, and the 2016 reality of low cost data generation and compilation.

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[216] DCAA MANUAL, *supra* note 22, at 5-907.f. ("supervisors who are accountable for meeting contract budgets should not have the opportunity to initiate time charges").

Regulations should not permit employers that use automated systems for tracking employees' exact hours, minutes, seconds, and milliseconds of work to erode the accuracy of those systems through rounding. Rounding should be available only to employers that track and enter time manually.[217]

VI. CONCLUSION

The problematic software features described in this research – features allowing supervisors to edit employee hours without their knowledge and that subtly legitimize those edits, as well as features implementing employer rules that systematically disfavor employees – are not beyond the reach of regulators. If the Department of Labor draws on behavioral compliance insights and places more stringent requirements on employers, they will demand – and software makers will produce – better software. The Department of Labor should consider revising its Field Operations Handbook to focus on employer procedures for ensuring the accuracy of timekeeping data. And "accuracy" should be measured as a procedural, rather than primarily substantive, matter. Employees should have access to timecards, and be meaningfully notified of edits and the reason for those edits. Data maintained by employers should be more susceptible to expert analysis through codebooks and more compatible export formats. Rounding should not be permitted in electronic timekeeping systems based on employee login and logouts. Taken together, these reforms should allow electronic timekeeping to live up to its promise as an efficient workforce management system, saving employers time and money and ensuring that employees receive a fair day's pay for a fair (and properly recorded and calculated) day's work.

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[217] Of course, in theory, such a regulation might incentivize some employers to adopt manual timekeeping systems. Given the savings and efficiencies that employers achieve by automating this function, however, we do not expect to see such a result.

APPENDIX: SCREENSHOTS OF SOFTWARE FUNCTIONALITY

These screenshots have been modified to magnify relevant portions of the screenshot. The screenshots also do not represent the entirety of the screen visible in YouTube. Other portions of the software functionality may have been visible in the video, but were not included in the screenshot to save space and focus on the relevant functionality.

As noted in Section III, *supra*, the functionality depicted below may not represent the default settings of the software and may represent a user-specific configuration or user-generated content. The screenshots also may not reflect subsequent software updates.

Figure 1: Edit Button Included Next to Timesheets[218]

218   HireLevel powered by Extra Help, *Extra Help, Inc. Payroll Services Timekeeping Demo*, YOUTUBE, (Mar. 5, 2014) https://www.youtube.com/watch?v=7JXQnBPnVUo (last visited Sept. 16, 2016)

Figure 2: "Edit/View" Option Under "Manage Time Cards" Functionality[219]

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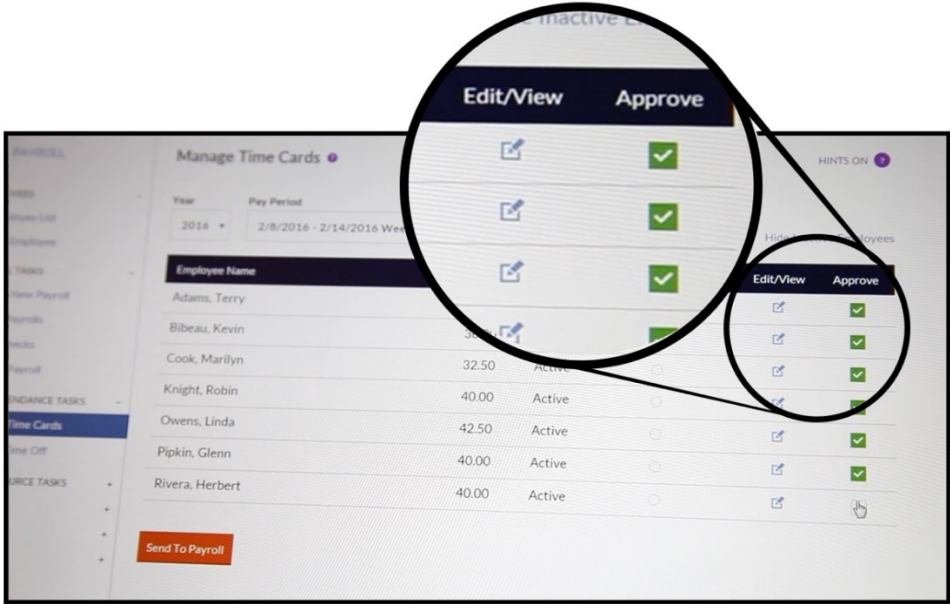
[219] Patriot Software, *Patriot Software's Time and Attendance Software*, YOUTUBE (Mar. 2, 2016) https://www.youtube.com/watch?v=iqZRBXndXGM (last visited Sept. 16, 2016).

Figure 3: Cursor-Based Edits to Employee Time Entries[220]
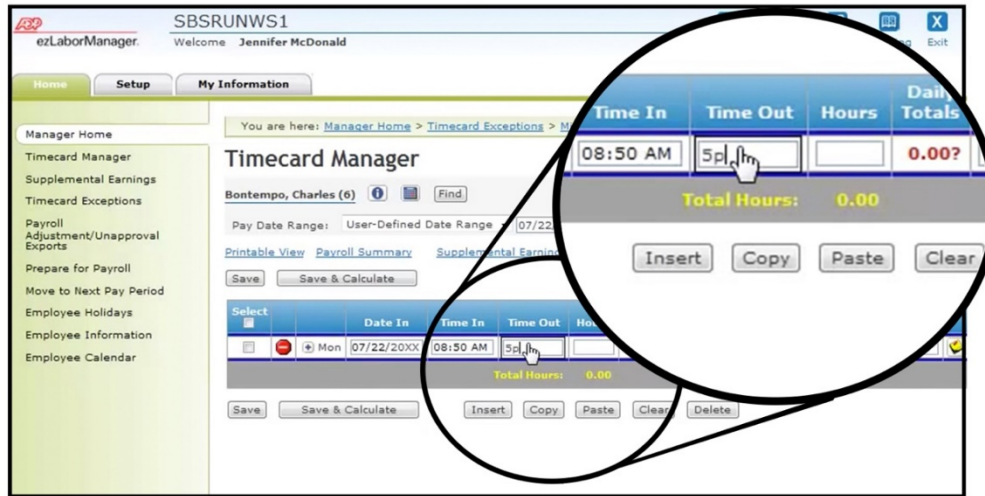
Figure 4: Cursor-Based Edits to Employee Time Entries[221]
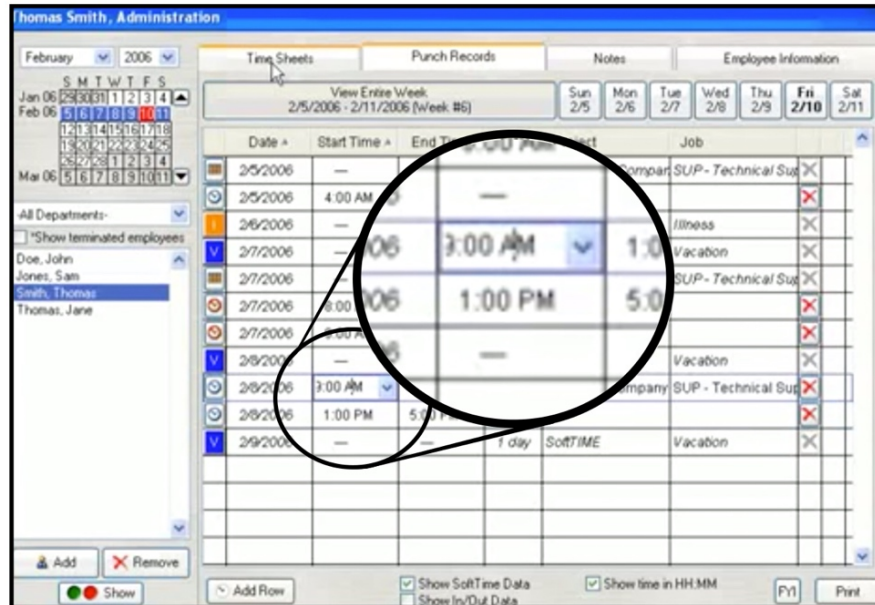
[221] David Lewis, *Timekron Timekeeping Software – Timesheet Time Keeping Solution*, YOUTUBE (Mar. 14, 2014) https://www.youtube.com/watch?v=7nCbJ8WMvUY (last visited Sept. 16, 2016).

Figure 5: Slider Functionality For Editing Employee Time Entry[222]

[222] TSheets, https://www.tsheets.com/ways-to-track-time [https://perma.cc/42E3-FCZB] (last visited Sept. 16, 2016).

Figure 6: Menu With Various Options For Deleting Punches[223]
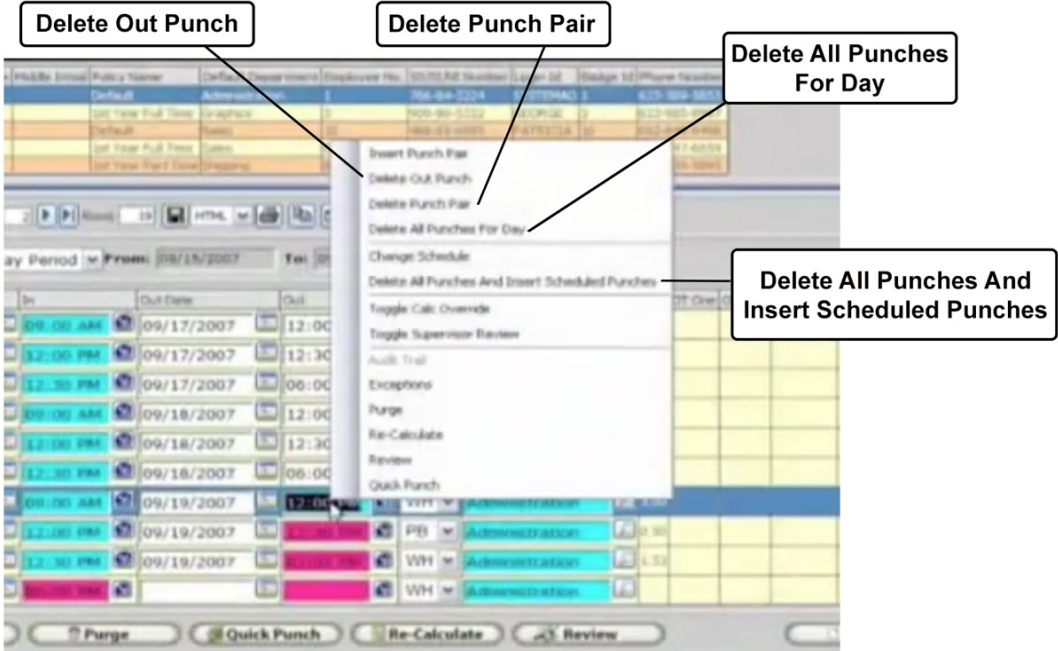
Figure 7: "Add Comment" Box, In Connection With Timesheet Edits[224]

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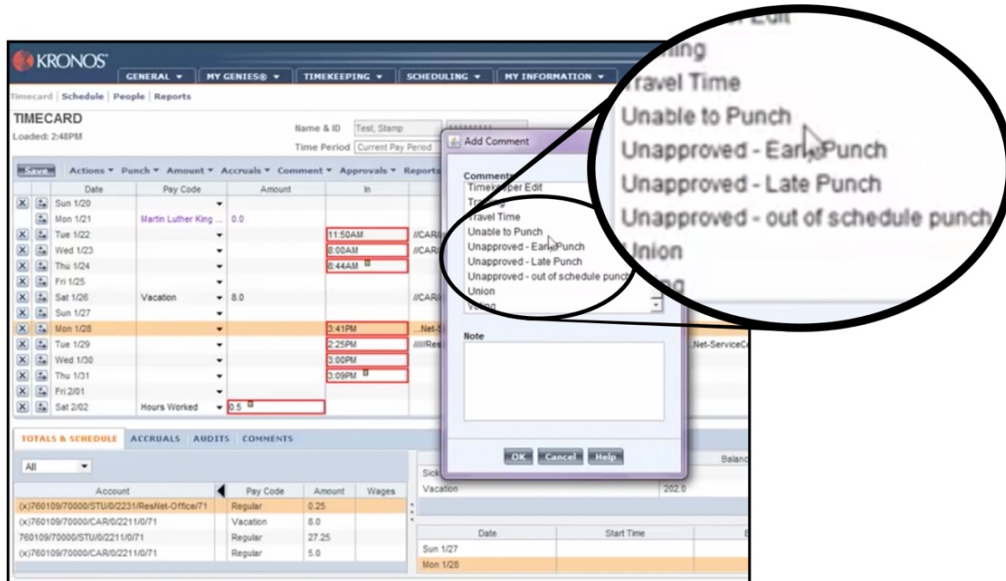
[224]   Rich K, *supra* note 59. Because this video was user generated, the pre-populated comments may have originated from the user rather than the software company.

Figure 8: Reconcile Overtime Feature[225]

Figure 9: Options for Reviewing Overtime[226]
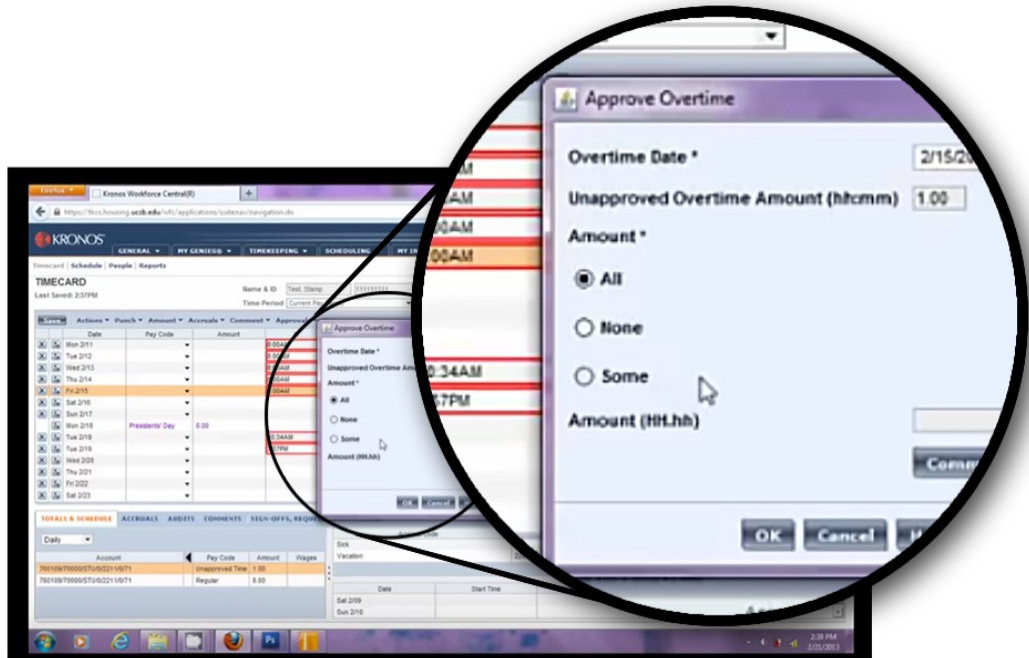
226   Rich K, *supra* note 59 (accompanying narration notes that if an employee works overtime, the employer is required to pay overtime).
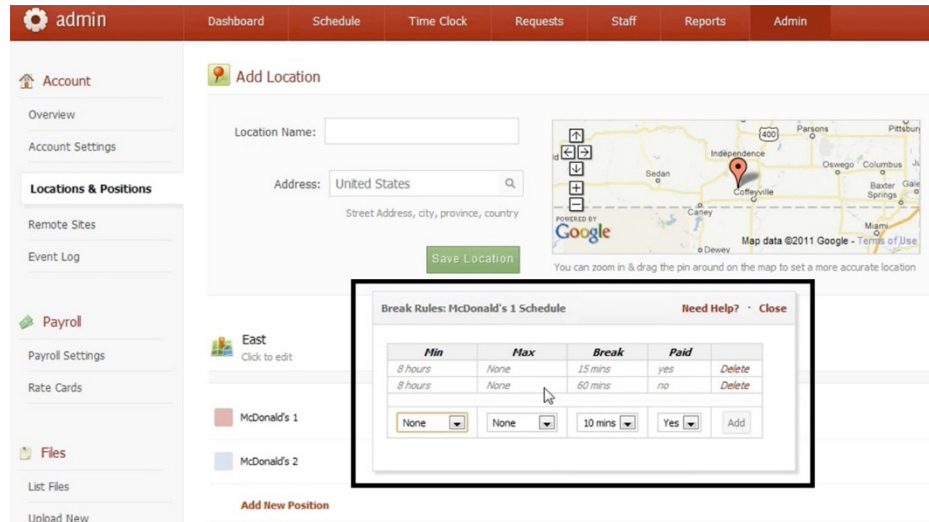
Figure 10: "Carry Forward Hours" Feature[227]

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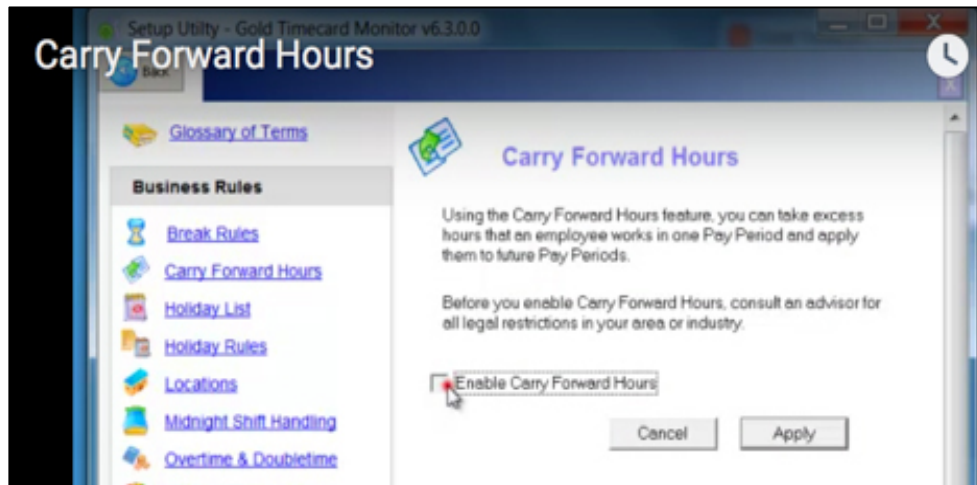
[227]   WorkforceIQ's Channel, *Carry Forward Hours*, YOUTUBE, (MAR. 13, 2012) https://www.youtube.com/watch?v=J5VfilICLlk (last visited Sept. 16, 2016).

Figure 11: Different Forms of Employer "Rules"[228]
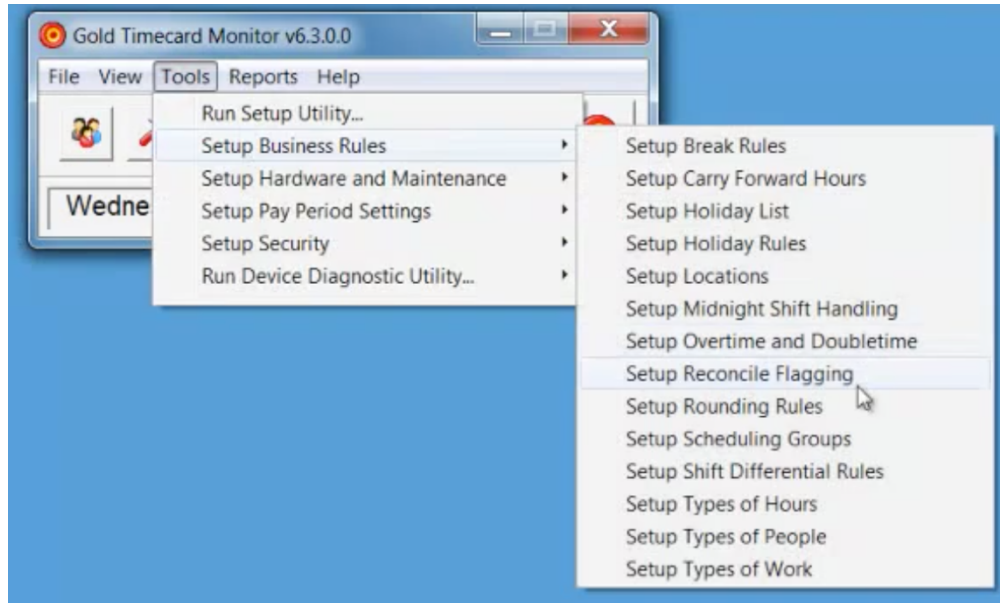
Figure   12:   Functionality   For   Automatic   Break Deductions[229]

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[229]   The black box was added to highlight the relevant portion of the screen. ShiftPlanning, *ShiftPlanning Tutorial – Lunch and Break Times*, YOUTUBE (Jan 12, 2012), https://www.youtube.com/watch?v=mrPlI8QZYG8 (last visited Sept. 16, 2016). This video did not originate from McDonald's, the narrator likely selected "McDonald's" as a generic company to use as an example for the software functionality.

Figure 13: "Auto-adding" A Break If Raw Data Indicates No Break[230]

Figure 14: Employer-Furnished Examples Of Rounding[231]

Actual Clock In or Out Time (Hour:Minute)	Calculation of Paid Time	Rounding Zone
Ex. #1: Clock in 07:57 Clock out 11:03	Rounded to 8:00 Rounded to 11:00 Paid time = 3.0 hours	Zone 1 Zone 1
Ex. #2: Clock in 3:10 Clock out 5:22	Rounded to 3:15 Rounded to 5:15 Paid time = 2.0 hours	Zone 2 Zone 2
Ex. #3: Clock in 08:25 Clock out 11:36	Rounded to 8:30 Rounded to 11:30 Paid time = 3.0 hours	Zone 3 Zone 3
Ex. #4: Clock in 08:38 Clock out 11:52	Rounded to 8:45 Rounded to 11:45 Paid time = 3.0 hours	Zone 4 Zone 4

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[231] VANDERBILT UNIV., *supra* note 138.