Lifting Up Worker Voice on Technology:

UNITE HERE's National Technology Program

We can imagine a world where automation gets us the world of The Jetsons or Star Trek … But we can also imagine a world where technology is used mostly to control and discipline workers.... Which world we get is not a technical question, but a question of power."[1]

"What does [technological] progress even mean, if it doesn't include better lives for people who work?"[2]

In 2018, UNITE HERE, under the leadership of then-President D. Taylor, began a substantial commitment to facing the challenges that technology poses for the hospitality industry. This commitment continues under Taylor's successor, Gwen Mills. The union made that commitment because they understand technology not as a neutral or positive force in the world, but as one that reflects the perspective and goals of its creators and implementors.[3] For technology to serve the needs of frontline workers, those workers need to be part of both the development and the implementation process.

The labor movement has long understood that the only power that ordinary people have is collective action—whether on the picket line or at the ballot box. Harnessing workers' power with regard to technology means educating and mobilizing working people to advocate for their own (and their co-workers') interests. Over the past eight years, UNITE HERE has used collective bargaining and worker mobilization to create a process for midcycle bargaining[4] when employers want to implement new technology. The union has also worked with academic researchers to understand workers' experience of existing technologies and to develop training initiatives to improve those experiences. Finally, UNITE HERE has partnered with tech developers to help advance worker-centered technologies. These three strategies work in tandem to advance a vision of technology that supports and uplifts humans at work rather than oppresses and replaces them.

The following paper is broken into seven sections. In Part 1, we recount the history and climate that led to the development of UNITE HERE's unique program. Part 2 describes the 2018 contract cycle during which

Ben Begleiter, UNITE HERE
bbegleiter@unitehere.org
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contracts covering close to 100,000 workers expired, and the union resolved to tackle the issue of technology in the negotiations for new contracts. Part 3 discusses the novel contract language that the union achieved in the 2018 contract cycle. Rather than bargaining over specific technologies, the contract language sets up a process to negotiate whenever the employer intends to implement new technology while the contract is in effect, a process we call, "midcycle bargaining." Over the past seven years, the union has used this midcycle bargaining to negotiate over one hundred times. In Part 4, we detail three case studies of midcycle bargaining: the algorithmic management of housekeepers, vehicle monitoring systems on delivery trucks, and robotic bartenders. Part 5 moves from bargaining to research and summarizes the ongoing collaboration between the union and a team of academic researchers who have been studying the impact of new technology on workers in the hospitality industry. Part 6 examines an example of the union's endeavor to not only protect workers from ill effects of technology, but also to harness technology innovation to help workers. Finally, in Part 7, we reflect on lessons learned in the first eight years of the program.

During the 2018 national Marriott strike in 8 cities, workers won a process to bargain about new technology.

1. PROJECT ORIGINS AND OVERVIEW

The history of work is the history of technology transforming labor. In every sector of the economy and across government at all levels, new technology has eliminated and changed work, created new work, and often disrupted workforces due to clumsy implementation or the absence of collective bargaining. The clearest negative impact is when new technologies eliminate or reduce the need for some jobs, for example, when automated telephone switching eliminated the need for human operators.[5] The loss of whole job categories continues to be a concern, but it is not the only major impact to consider. Another major effect is when new technology transforms existing tasks by creating new processes, surveillance, methods of control, or transfers work from one job classification to another (or to customers).

Like all unions, UNITE HERE has a long history of bargaining over technology. Over the years, technologies like industrial dishwashing machines or algorithmic management in housekeeping have transformed or eliminated jobs. Local unions fought for their members and, in some cases, achieved impressive results. Locals might also share contract language that they had achieved with other locals. There was not, however, a systemic approach.

In the late 2010s, in response to modern technology innovations in robotics and artificial intelligence (AI), UNITE HERE President D. Taylor saw a need to coordinate and supplement local efforts. Taylor credits a visit to the CES Technology show (formerly known as the "Consumer Electronics Show") in Las Vegas in 2017 as the impetus for his thinking. Unlike previous years, he explains, this time there were:

> Huge sections about driverless cars, driverless trucks, all this stuff, and I'm like, 'Okay, well, if they can figure that out, they can figure out our jobs.' So, then I really dug into what was going on in our industry. And the more I dug into it, I'm like, 'If we don't do something proactive, all we're going to do is effects-bargaining over, and over, and over, kind of like Groundhog Day, but in a very bad way.' [6]

Taylor's experience at CES came towards the end of a decade where the prevailing wisdom was that automation would radically transform work. Throughout the 2010s the popular and academic literature heralded a jobless future (or, at least, a future with substantially fewer jobs). Books like Martin Ford's *Rise of the Robots* (2015) or Brynjolfsson and McAfee's *The Second Machine Age* (2016) predicted widespread job loss. At the same time, targeted studies from Oxford,[7] McKinsey[8] and Brookings[9] sought to identify jobs (or tasks) that were most at risk to total or partial automation. Those studies put hospitality at or near the top of the list for elimination. The 2019 report by the Brookings Institution ranked Las Vegas as the city 5th in the nation for potential disruption due to automation in its core industries. These books and articles often resulted in news articles and opinion pieces like one titled "Las Vegas at risk for automation-related job loss" which appeared in one of the Las Vegas newspapers in 2019.[10] (See the predicted effect on the "accommodation and food service" industry in Chart 1.) The books, articles and studies prompted numerous organizations (including the AFL-CIO) to prepare in-depth "future of work" studies.[11] For Taylor, the impending crush of technology seemed likely to overwhelm local efforts no matter how diligent and impressive. It was a problem that Taylor believed needed a centralized approach.

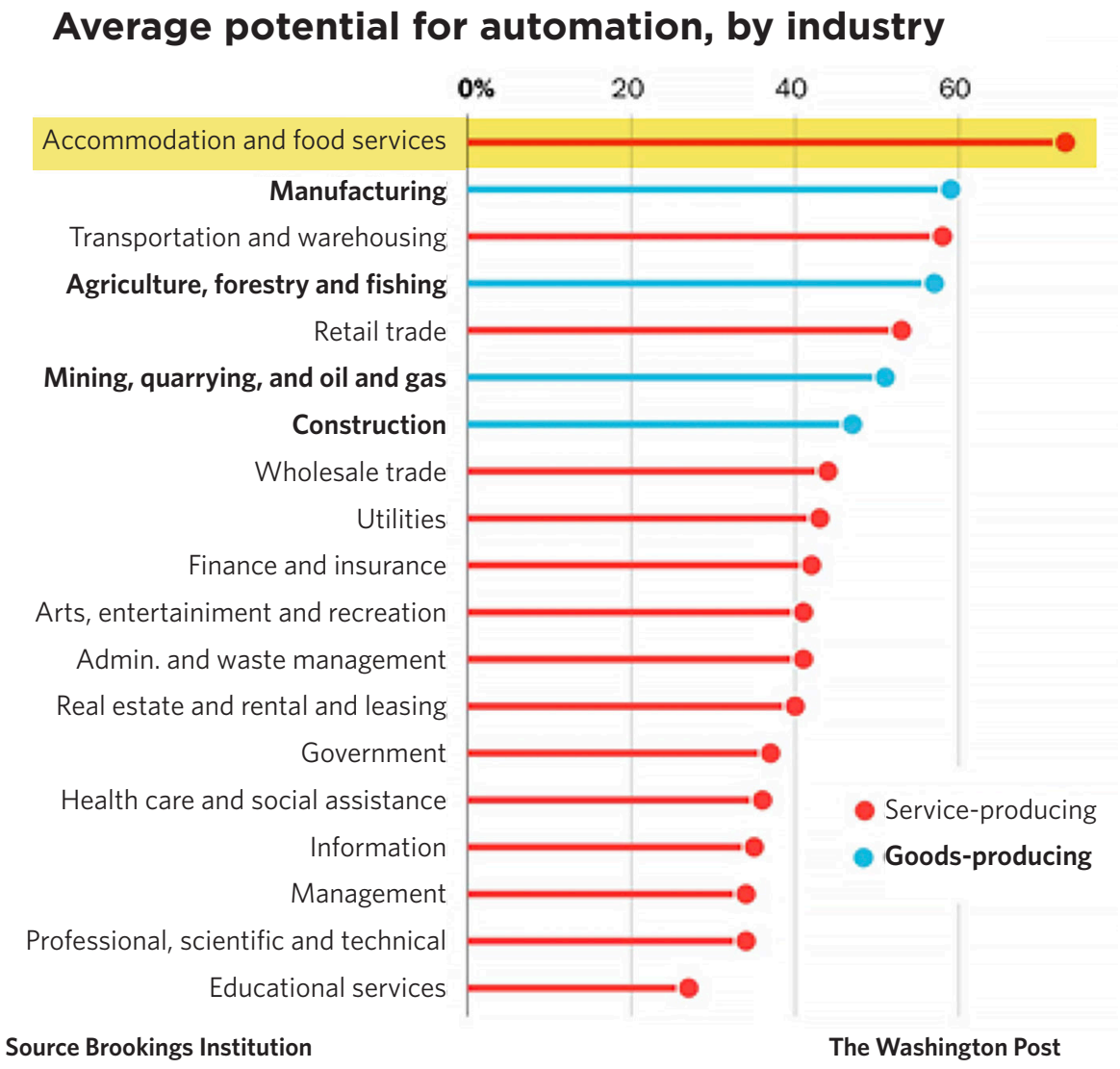

Chart 1: 2019 Graphic showing industries with a high "potential for automation."[12]

One of the reasons that hospitality might have ranked so high on the list of industries with the greatest potential job loss was (and is) the myriad of technologies available. The list of new technologies being deployed in the hospitality sector is long and growing: QR-code ordering and checkout, tablets at food service kiosks, automated bartenders, automated dishwashers, robotic chefs, automated guest check-in, AI chatbot concierges, delivery bots in hotels, maidbots, chatbots replacing operators, burger-flipping and salad-making robots, automated fryers, "wearable technology," cashierless convenience stores, self-pour beverage walls in stadiums and restaurants, and mobile apps that use algorithms to manage work tasks.

The particulars of the industry—the multitude of technologies and the structure of the industries (multiple employers with divided decision making)—combined with the reality that collective bargaining agreements (CBAs) expire every three-to-five years, left the union with an unusual problem: how to protect workers when the technologies that threatened them were rapidly developing, and their deployment could come at any time between bargaining rounds or cycles.

The solution that Taylor and the union arrived at was novel. Rather than bargain about particular technologies during the negotiations for a new CBA, the union fought for language that created a process for bargaining mid-contract cycle when an employer planned to implement a new technology. So, for example, if a casino wanted to implement a robot bartender a year after settling a new CBA, the casino would be required to engage in bargaining *before* deploying the robots. This approach created a dynamic where throughout the life of the union contract the technology agreement acted as a "funnel' through which all technology, no matter its level of sophistication, was subject to the union's scrutiny and evaluation and, potentially, negotiations.

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In order to succeed at winning the new language, Taylor understood that workers were going to need to value the ability to bargain over technology as much as they valued raises and benefits. So, in 2018, when the union had contract expirations in Las Vegas and 10 other cities with large hotel presences, Taylor deployed staff around the country to educate shop stewards and other rank-and-file union leaders on the threat of technology.[13] As Taylor describes it:

> And so in 2018 what we did is that I got a bunch of videos, [of robots doing work] like the bricklayer video, the storing bags video, and we showed the [rank and file leaders] … because talking about it [is one thing]… And I said, 'listen, we're not going to stop it.'
>
> And at that time, really with the introduction of Uber and Lyft, our bellmen were getting hurt and they said, 'Hey, we've got to stop Uber and Lyft.' And so I remember having a meeting of the bellmen and I said, 'could everybody take out their phone.' I said, 'how many have Uber or Lyft app on their phone?' … And they all had it. I said, 'guys, we're not going to stop it. We gotta figure this out.'
>
> And we really spent time on having videos and demonstrations about what technology could do and what it probably would do. I said, 'how many of y'all have gone to the airport and ordered off a kiosk?' It was just starting there. And people raised their hands. I go, 'well, why wouldn't they do that in your place [of work]?' … So I think that what we had to do is with the workers is *show 'em*, not just talking about, *show 'em* videos that were out there.[14]

Ultimately, the strategy succeeded. By the end of 2019, the union expanded technology rights to about 25% of its total membership. In subsequent years, that number expanded to about two-thirds of the members.[15] In Part 4 of this paper, we will detail three case studies of midcycle bargaining.

Taylor also recognized that midcycle bargaining over technology was going to require additional expertise that the union didn't currently possess. Taylor assigned international staff, with assistance from Ed Wytkind, formerly the president of the Transportation Trades Department, AFL-CIO, to run a national program and delve into hospitality technology.

At the same time, Carnegie Mellon's President Farnam Jahanian had a vision for Carnegie Mellon University (CMU) "to be the university that leads at the nexus of technology and humanity and the nexus of technology and society."[16] Taylor was one of more than 30 labor leaders that participated in a summit in 2018 at CMU organized by the university and the AFL-CIO under the leadership of then-AFL-CIO President Rich Trumka and current President Liz Shuler to "discuss the future of AI and robotics." In the aftermath of that summit, Taylor, UNITE HERE leaders and CMU faculty met to explore ways to work together.

The union's goals in the collaboration were twofold: first, to expand the union's knowledge of emerging technologies by engaging with top researchers, and second, to begin to upstream workers' voices so that the technology that is developed reflects the needs of front-line workers.[17] With CMU Professor Jodi Forlizzi, from CMU's Human Computer Interaction Institute at the lead, the collaboration expanded to include academics from New Mexico State University, University of Illinois, Michigan State University and Stockton University. To date, the research work has received funding from the National Science Foundation, the Russell Sage Foundation, and CMU's Block Center.

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The third component of Taylor's vision began to take shape in 2020. For Taylor, it wasn't enough to protect workers from the harmful effects of technology. The union needed to also figure out ways in which new technology could be harnessed for the benefit of its members. The immediate impetus was the relocation of the Raiders football team to Las Vegas. Concessions at sports stadiums are, generally, operated by third-party subcontractors and UNITE HERE represents workers at many of them. Stadium concessions are also difficult for those subcontractors to staff because it is part-time work, and there is a need for a large number of workers on game and event days. At the same time, while the Las Vegas casinos employ tens of thousands of hospitality workers, not all of them have full-time shifts. Taylor wanted to use technology to pair underemployed casino workers with temporary positions that paid union wages and benefits at the stadium and elsewhere. Serendipitously, a group of former Caesars casino executives had a similar vision of transforming the gig space within hospitality to support workers and approached Taylor about collaborating a couple of months before the COVID pandemic began.

Since 2018, the union has worked to build out Taylor's vision of bargaining, research, and using technology for the members. In what follows, we describe the major accomplishments and challenges in each of the three areas.

2. BARGAINING TO BARGAIN: 2018 CONTRACT NEGOTIATIONS SET A STANDARD

In some ways, the modern industrial labor movement in the United States can be said to be spawned by technology. In particular, the technological changes that occurred during the industrial revolution helped to spur the development of the Labor Movement in America.[18] Union contract negotiations over technology

date back to the start of the labor movement. As technological change has continued and intensified in the digital era, unions have negotiated in an effort to shape the use and implementation of technology. While UNITE HERE's approach is unique, it is not the only union to bargain over new technology in recent years.[19]

As mentioned above, UNITE HERE has pursued a different approach to bargaining designed to prepare for this rapidly evolving era and avoid simply reacting to one-off technological changes as they show up at our members' workplaces. Instead of using the contract negotiations to reach agreements about particular technologies (e.g., robotic bartenders), the union sought to create *a continuous process* to deal with new technologies when the employer wanted to implement them. Reflecting on the language, Taylor emphasized the development and evolution of new technology:

> We didn't know what technology was going to get evolved, and frankly, the industry didn't [either]. So, I didn't want to be hampered in. Number two. I thought this idea that let's just take whatever the three technologies [are being used now and bargain over those], that technology was going to evolve itself, so you would really be static. And I tried to get away from being static. … I had a very strong opinion that whatever we negotiated, if we tried to be static, [it] could easily become obsolete very soon. And I thought that was shortsighted.[20]

At the end of May 2018, Las Vegas workers took a strike vote which ultimately led to a settlement that included a new technology bargaining process. That fall, thousands of workers at Marriott hotels across seven cities went on strike. In addition to demanding improved wages and benefits, workers demanded a say in technology implementation. The strike lasted over 100 days and resulted in historic agreements.

Taylor looked for examples of technology contract language that created such a process used by other unions but "frankly, outside of the Longshoremen on the West Coast, it was pretty thin. So, I said, 'we'll have to develop it ourselves.' And that was the origin of our whole perspective on technology and work - having a real say in it and not just being reactive."[21]

Taylor launched the union on a major worker education program in advance of 2018, when contracts covering 100,000 workers were scheduled to expire.

> We had [staff] go to locals to give presentations in front of their leadership, the executive board, and then went after the shop stewards [and] committee…At the end of the day, no one's going to fight for something they don't understand, or they don't think is important, and I knew once people got exposed to it, people would go 'Okay.'[22]

At the same time, the union drafted language to propose in the upcoming negotiations. The first contract expirations were in Las Vegas, where the bargaining over 60,000 workers' wages, benefits, and working conditions began near the beginning of the year. At the end of May 2018, workers took a strike vote which ultimately led to a settlement that included a new technology bargaining process.[23] That fall, thousands of workers at Marriott hotels across seven cities went on strike.[24] In addition to demanding improved wages and benefits, workers demanded a say in technology implementation. The strike lasted over 100 days and resulted in historic agreements. The employers were resistant to the new language. As Taylor recalled, "I

don't think it was a coincidence that the last issue settled in Las Vegas, as we geared up for a strike, was technology, and the last issue in the Marriott strike was technology."[25]

Image: Las Vegas Casino Workers vote to strike (2018). Source: UNITE HERE.

Taylor is clear that the goal of the language is not to prevent new technology implementation. "You're not going to stop technology. You're not. And I think anybody who says that is just lying." The goal "is about having real input, which you have in here." Taylor summarizes the problem with excluding workers from the process with an anecdote about slot players who order drinks on a machine rather than from a cocktail server. The order is sent directly to the bartender, and then the server is sent to deliver the drink to a particular seat at a particular machine. Ordering drinks from a slot machine is predicated on the idea that the person ordering the drink is going to stay put until the drink arrives. But as any cocktail server knows, slot players move if the machine they are playing on isn't paying out. Sometimes they move one seat over, sometimes one row, sometimes to the other side of a casino that might be two or three football fields in size. Under a system in which a human takes the order, she can find the customer again. When the only indication of the patron is a seat, she is unable to find someone who has relocated. In Taylor's words:

> Well, the problem is if the slot machine is not hitting, [the patrons] move on. So, you've gotten a drink order and [the patron is] gone.[26]

Unpacking the example makes it clear how implementing without frontline worker input can lead to bad outcomes for all parties. Poor implementation has led to a lose-lose-lose situation. There is a waste of a drink and customer dissatisfaction for the company, the customer doesn't get the beverage they ordered, and the cocktail server loses out on the gratuity.

3. Contract Language on Technology

The novel language that workers won has five main components:

I. a broad definition of technology,
II. a requirement for advanced notification of up to 6 months,
III. a requirement to negotiate,
IV. job capture and training,
V. and finally, recall and severance language for jobs that are eliminated.

For the agreements in some sectors, there is also the creation of a national committee of locals to handle the bargaining and strict timelines to ensure the process moves along. Before turning to examples of UNITE HERE's tech bargaining, it is worthwhile to analyze the contractual language.

CBA Language I: Broad Definition of Technology

While the technology language assumes that the technology will ultimately be implemented, it creates both a process to bargain as well as protections for the workers in the event of job loss. The language begins with a broad definition of technology.

> Technological change includes but is not limited to the use of machines (including by way of example only, computers, robots, handheld devices, and tablets), automation, software, systems, programs, applications or other scientific advancements to replace or substitute for, improve, alter, increase or decrease, or evolve the type or manner of work performed by bargaining unit employees in the Employer's workplace.[27]

Technology in this definition includes not only robots, but virtually any other type of "scientific advancement"—software, apps, etc. Even though this language was written prior to the current AI craze, it covers AI and has been used to bargain over a variety of types of AI: computer vision, machine learning, and generative AI. The breadth of the language has enabled the union to negotiate over technologies as diverse as delivery robots, vehicle monitoring systems, digital check-in for hotel guests, algorithmic management systems, cashierless markets, chatbots and more.

Equally significant to the breadth of types of technology is the range of the types of impact. Some technologies replace existing work, like a self-checkout machine in a grocery store, which eliminates (or at least reduces) the need for cashiers. Other technologies transform work. To maintain our grocery store example, the implementation of UPC barcodes and scanners transformed the job of cashier. Previously, a cashier needed to type the price of each item individually into the register. After the invention of the UPC code and the corresponding scanner, prices could be set automatically, and the cashier no longer needed to key in the amount for each can or box; they could just run the barcode over the scanner.

Technology doesn't just replace work, sometimes it changes it. And in some cases, it does both. UPC technology not only transformed the cashier position, but also the stocker position by eliminating the need to price each item individually, thereby making the process of stocking shelves less time consuming and labor-intensive. In many cases in the service industry, labor-replacing technology is only so because it

transfers labor from one job classification to another or from an employee to a customer. Self-checkout, for example, transfers the work from an employee (cashier) to customers.

CBA Language II & III: Requirement for Advanced Notification and Negotiation

The phrase that specifies the relationship of the technology to the work: "to replace or substitute for, improve, alter, increase or decrease, or evolve the type or manner of work performed by bargaining unit employees," ensures that the union has the right to bargain over *both* labor-replacing technologies ("to replace or substitute") and labor-transforming technologies ("improve, alter, increase or decrease or evolve"). This second clause has proven to be critically important as UNITE HERE has seen more labor-transforming rather than labor-replacing technologies.

While the language requires that the employers negotiate prior to implementation, that requirement is bolstered by two important clauses. First, advanced notification is critical to the bargaining process. Were the employer to inform the union three weeks prior to implementation, for example, there would be no time to engage with affected workers, understand the technology and bargain. The UNITE HERE language requires up to six months to do this. Second, as part of the advanced notification, the employer is required to provide information and answer questions (information requests) about the technology:

> The Employer shall explain to the [union] the intended function of the new technology, the nature of the technology and who will develop it, the timing of its planned implementation, and the expected work needed to implement the technology and keep it running, and where available shall share prototypes.[28]

Significantly, the employer is required to provide this information with the advanced notification. It is only after receiving the notification with this initial round of information that the union makes the decision to request to negotiate or not.

While technology can deskill jobs by simplifying a task (like in the case of the grocery clerk not needing to key in prices), it can also upskill jobs. Upskilling isn't only about teaching laid-off workers to code in python, for example, take hotel housekeeping. In pre-technology days, housekeepers were given assignments on paper on a clipboard--no technology literacy needed. As technology has entered the hospitality field, it hasn't spared housekeeping. Algorithmic management tools that replace the housekeeper's clipboard with a handheld device have become widespread. With these tools, housekeeping has become one that requires the housekeeper to have digital skills with the device and app. It also demands a level of literacy that it did not previously require which can be challenging for a largely immigrant workforce.

CBA Language IV: Job Capture and Training

When technology is implemented, sometimes additional tasks are created, and it is not always clear if those tasks will be assigned to a union member or not. The UNITE HERE technology contract language addresses this issue in two ways. It dictates that new jobs are part of the bargaining unit, and it mandates employer paid training--including college courses if necessary.

> If new technology performs functions previously performed by bargaining unit employees and requires human operation of machines, the machines shall be operated by bargaining unit employees

> and the Employer shall train employees in the affected classification to operate new technology. If the machines used by bargaining unit employees require daily maintenance to ensure the continued operation, then bargaining employees [sic] will be trained to perform the work, unless such work is of the kind typically performed by other bargaining units or the Company's IT department.... If operation requires a level of skill which may practically be obtained only through academic study, and the necessary courses are offered at educational institutions in the county where the hotel is located, the Employer shall pay the tuition and fees, of an employee taking such coursework.[29]

For job transforming technology, the language contains the features that are necessary for the successful adaptation of bargaining unit members to new tasks that come about as a result of technology.

CBA Language V: Requirements for Recall and Severance

In contrast, for job-replacing technology, the agreements provide ways to cushion the loss for the worker. The agreement provides for both recall rights[30] and severance. In the hotel contracts, it specifies, "any employee displaced due to technological change shall be entitled to recall to the classification from which the employee was displaced for 24 months." The language goes on to say that the displaced employee will also have preferred hiring for other jobs within the hotel or within any other UNITE HERE organized hotel in the same state (with the same employer). The agreement requires that the employer continue to make payments to maintain the displaced employee's health insurance for 6 months and, in the event the worker is not recalled or chooses not to remain on the recall list, they can execute a severance agreement which "include[s] a payment equal to one week of pay for every year of service."

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While the language provides a framework that enables midcycle bargaining, the mechanics of the process are still subject to variation. UNITE HERE has recognized this and adopted bargaining principles to guide the bargaining. Workers play a crucial role. They possess the most detailed knowledge of work processes, so including their voices in the process is a top priority. In addition to involving impacted workers in the bargaining, the union aims to create guardrails around the introduction of new technologies to protect existing workers. Because these are novel technologies, the union endeavors to include ongoing data requests to evaluate the impact of the technology on the workers and to create opportunities for continuing worker input *after* implementation in the midcycle agreements. Inherent in bargaining over novel technologies is a lack of experience with the particular technology on the part of management, the workers, and the union representatives. Despite the best efforts, there may be unforeseen concerns that arise. Providing for continued worker input (data and continuing input) is a recognition of the novelty and an attempt to continue to understand the technology and its effect on workers.

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4. MIDCYCLE BARGAINING CASE STUDIES

The first contracts with the novel language were ratified in 2018, and the first midcycle technology notifications began to appear in 2019. In Las Vegas, informed by midcycle bargaining over the previous four years, the union negotiated improvements to the tech language in the 2023 contracts.[31]

Since 2019, the midcycle bargaining process has been initiated over 100 times. Over the past 7 years, the union has bargained over several types of AI (computer vision, machine learning, generative), delivery robots, robotic bartenders, vehicle surveillance, mobile ordering, smart vending machines, cashierless markets and more. Below, we will detail three case studies illustrating how midcycle bargaining processes have unfolded.

Since 2019, UNITE HERE's midcycle bargaining process has been used over 100 times to negotiate over a variety of technologies including: mobile check-in, mobile ordering, algorithmic management in housekeeping, self-checkout kiosks, cashierless stores, robotic coffee machines, automated beer and wine taps, salad making robots, pool towel trackers, robot delivery/busing robots, robot vending machines, smart refrigerators, vehicle monitoring systems, valet systems.

Housekeepers and algorithmic management

UNITE HERE's Las Vegas locals (Culinary Workers Union, Local 226 and Bartenders Union Local 165) have been lynchpins of UNITE HERE's campaign to bargain over technology. New protections for workers were won in 2018, and those provisions were extended and strengthened in 2023.[32]

Not only were the Las Vegas locals the first to bargain the novel technology language into the contracts, Las Vegas has also seen more midcycle bargaining around technology implementation than any other city with UNITE HERE-represented workers. One of the first notifications that the local received was for an algorithmic management system for hotel housekeeping. The notification came from one of the two largest employers on the Vegas Strip, and it covered several thousand housekeepers.

Hotel housekeeping is unpredictable and physically taxing work. The lack of predictability comes from vagaries of customer behavior. Customers may leave early or late; they may stay in their room or go out; they may have left their room in near pristine condition, or they may have left it in a state of disrepair (in the industry, the term of art is, "trashed"). Additionally, guests who are checking in may arrive well before the designated check-in time, necessitating a "rush room." The labor is also physically taxing. Housekeepers push carts that weigh up to 300 pounds across carpeted floors all day. The work in the rooms is varied, but ergonomically challenging. As a consequence, housekeepers (or guest room attendants, GRAs) have the highest injury rates of any hospitality profession.[33]

Historically, a housekeeper started her day with a clipboard with a list of rooms to be cleaned, and she cleaned them in the order that made sense when the rooms were available. She could alternate between stay-over rooms (which don't generally require linen changes and are less work) and the more strenuous checkout rooms. As she encountered "do not disturb" signs or guests leaving their rooms, she could make a mental note and order her day accordingly. Updates to a housekeeper's list could only happen at lunch or if a manager came up to the floors (or used a radio) to find her and inform her about a rush room or another change.

Technology came to housekeeping in the form of an algorithmic management tool (AM) to replace the clipboard and radio. As the research team studying these types of technology describe:

> [The AM] is a phone and browser-based app algorithmic management tool which coordinates room cleaning assignments and guest services across the department. [It] also tracks guest requests and maintenance tickets throughout the hotel, delegating tasks to workers and timing their completion....
>
> [It] differs from more traditional (AM) systems, such as those used in warehousing or ride-sharing, in several significant ways. [The program] focuses on optimizing the return of specific rooms as quickly as possible, prioritizing management needs over worker experience, efficiency, or even control. Profits in the service industry are uniquely tied to loyalty programs, which emphasize enhanced guest satisfaction to encourage repeat business. For example, [it] might assign a VIP room first, regardless of its location relative to other tasks, disrupting the sequential workflow of GRAs. This contrasts with other common AM systems, which aim to minimize labor costs through just-in-time delivery, step-by-step task directives, and algorithmic incentives to make individuals work faster....
>
> In addition to these baseline functions, the tool also includes dynamic and highly configurable software, which is implemented differently across hotel properties. [The AM's] supervisor-facing interface can be configured to varying levels of algorithmic assistance, from auto-dispatch to manual assignment dispatch. [Its] worker-facing interface can be configured with varying levels of algorithmic control, such as letting workers change their task order by skipping rooms in the app, or requiring workers to complete tasks in the order they were assigned....
>
> The way [the program] is configured in any particular property can change, thus leading to high variation in how workers experience agency under the AM. [34]

Within UNITE HERE there had long been complaints about the technology and specifically requiring housekeepers to clean rooms in a particular order. As Culinary Union research director Zach Poppel describes it, the overall effect of the algorithmic manager was that it "stripped them [the housekeepers] of a whole set of control and autonomy." [35]

As the union began bargaining with the employer, they knew that it was going to require worker input to both understand the implications and secure a good agreement. As Local 226 organizing director Johanna Dalton explains, "We were all kind of in new territory ... We need to bring workers as part of it ... They're the experts. They know that hotel. They know those floors." Once the mobilization started, "The workers really just started to build up our argument with the company that the direction that they were going was a dramatic change in existing practice, right? ... The committee just laid out all the ways in which that would not work." [36] Bargaining extended past the six-month period, and the employer implemented the technology, configuring it so that the GRAs only saw one room at a time on their screen, making GRAs move out of their traditional stations (sections) and requiring the GRAs to follow the program's room cleaning sequence.

The housekeepers disliked the new app because it made their work harder. Some rooms are harder to clean than others, especially checkout rooms which require much more work than stayover rooms. Housekeepers who can sequence their own work can structure their day to alternate between harder and

easier assignments, but the app initially disregarded this practice. “It was basically putting a smartphone in the hand of a housekeeper as a way to give assignments to the guest room attendant (GRA) as to how they should be doing their work … to determine what the guestroom attendant did next, what room they cleaned next.” [37]

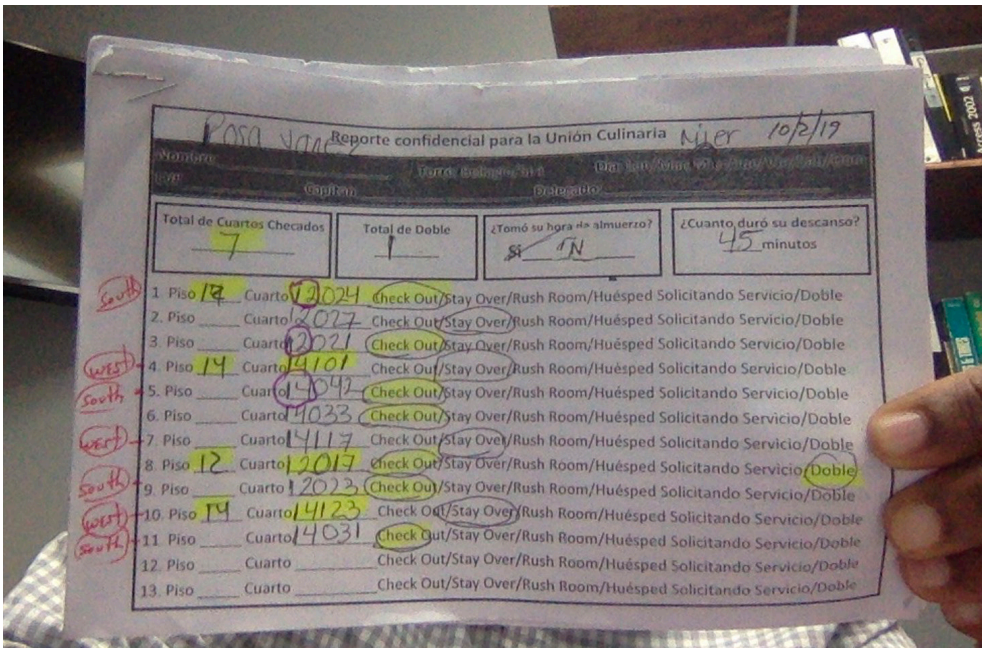

Image: to understand the technology, GRAs kept paper records of the order of their assignments.

The union also understood that they were going to need data to understand the program. They collected this in two ways. First, they asked GRAs to make a diary of their work. Each time the app sent a GRA to a new room, the GRA logged the new room number and whether it was a checkout or stayover. At the end of the shift, the GRAs would turn in the logs to the union. A team of union researchers analyzed the logs and created maps (graphic representations) of some of the logs. These maps were used in bargaining to demonstrate to the company the inefficiencies of algorithmic management. At the same time, the maps were used to educate and agitate other GRAs, leading the GRAs to demand the ability to self-sequence their room assignments.

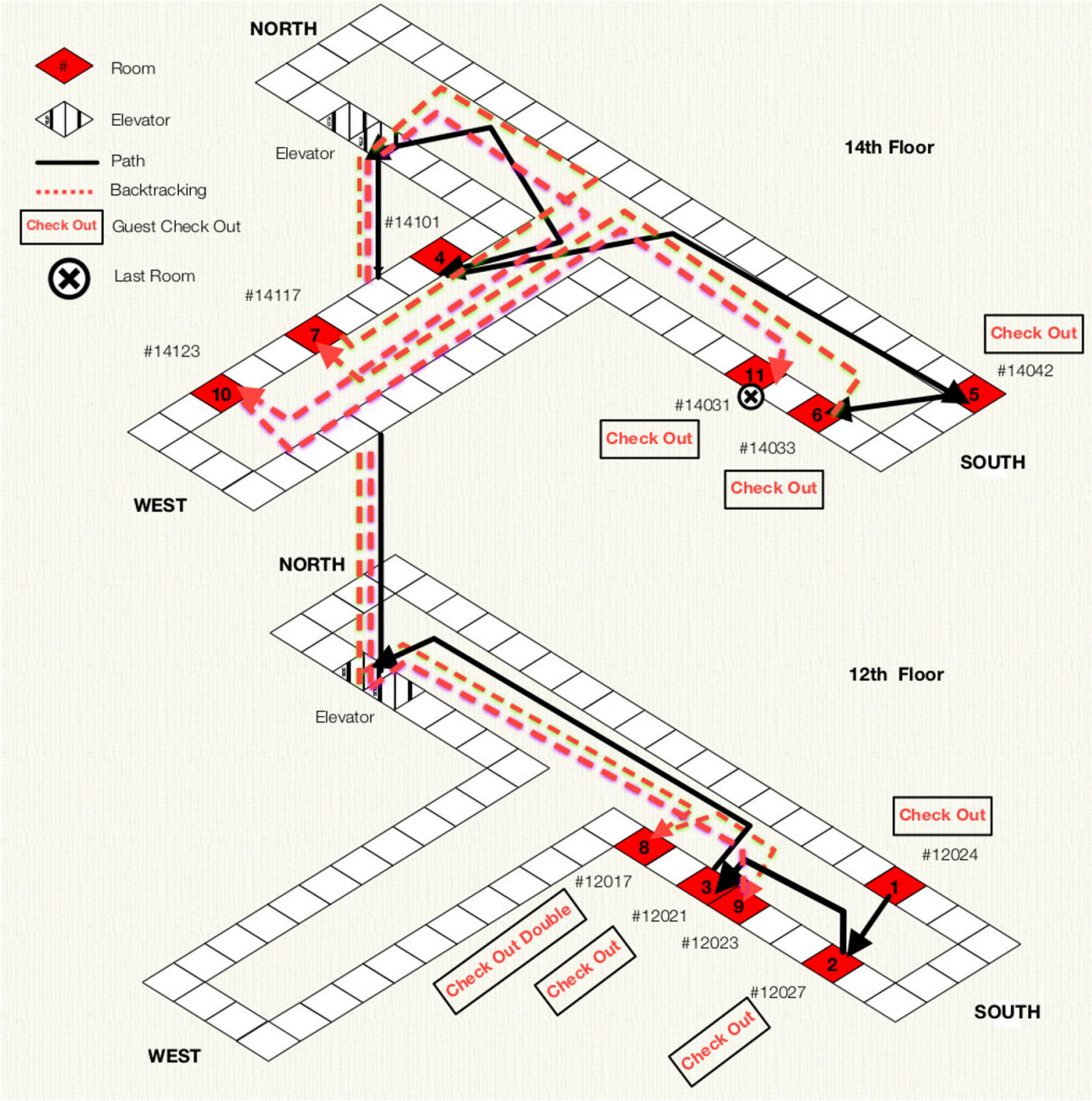

Image: Map created from GRA records

At the same time, understanding that the program recorded data about the GRAs' work, the union submitted a formal information request for those data. When the information request came back, the union was faced with tens of thousands of lines of data. Fortunately, one of the newer researchers had experience writing computer code. He created a program that analyzed the data and looked for contract violations (places where there wasn't a reduction to the GRA's daily quota when there should have been). According to the researcher, "There's lots of talk about how data gets used against workers, but we were able to use the data the technology collected to protect the workers from contract violations."[38] The program enabled a type of data collection and analysis that the union had never been able to achieve before because it recorded

every room assignment for every housekeeper every day. These data revealed approximately 500 instances in a ten-week period that housekeepers didn't get the appropriate workload reduction per the contract.[39]

Ultimately, the combination of worker advocacy, contract enforcement and bargaining led to a negotiated side letter (Memorandum of Agreement). The settlement changed how the technology was used by housekeepers. The agreement requires that housekeepers be assigned rooms in their station to the greatest extent possible and mandates that the app display their entire assignment (all rooms) from the beginning of the day, thus returning their autonomy and restoring to them the right to decide for themselves the order in which to complete their assignment. Additionally, the agreement guaranteed the union access to the data that the software collects, enabling the union to audit it for compliance with the CBA.

The combination of worker advocacy, contract enforcement and bargaining led to a negotiated side letter (Memorandum of Agreement). The settlement changed how the technology was used by housekeepers—putting the worker in charge of the technology rather than the technology in charge of the worker.

In prepared comments at a conference organized by the Trades Union Congress (the British equivalent of the AFL-CIO), Mirtha Rojas, a housekeeping leader said:

> When technology control workers, they don't feel good, they get burned out. When workers control technology, they feel more confident and more respected. But to win that respect, the workers have to stand up. We have to take what we know and turn it into power.
>
> For us the phone meant micro-management like we had never seen. It meant we lost control. It was insulting…But thankfully we are union. We have technology rights. We generated our own data. We kept daily diaries of where the phones were sending them. We made thousands of reports. We put our data on leaflets and when it came time for the company to train GRAs on the smartphones, we spoke up loudly….Because of this work and my union contract I have protected my ability to self-sequence my workload.[40]

Because the union has a national program on technology, what happened in Vegas didn't stay in Vegas. The language of the Las Vegas MOU became a template for bargaining over the same or similar technologies in other cities. At a Senate Health, Education, Labor and Pensions Committee hearing, UNITE HERE Local 26 (Boston) President Carlos Aramayo described the impact of similar language that had recently been negotiated at one of the Boston hotels:

> And because the workers were part of the [process], it was able to do two things. One, it did create some efficiencies for Hilton, which are good for the company, but also it provided real benefits to our members. One, they were able to override the direction of the technology if they felt that was appropriate for their workday, and then secondly, they were able to get the technology to provide an audit of their workday that would help guarantee that they were paid correctly.[41]

Food Delivery Drivers and Vehicle Surveillance

In addition to hotels and casinos, UNITE HERE represents workers in industrial food service. At countless venues, from university cafeterias to sports stadiums to museums to corporate cafeterias, subcontracted food service companies prepare, serve and sell food. In many of those locations, the men and women who cook and serve that food are UNITE HERE members. UNITE HERE also represents many workers in corporate tech cafeterias. At the sprawling campuses of some of the richest tech companies in the world, UNITE HERE members not only cook and serve food but also, because of the size of the locations, deliver food by vehicles to various parts of the campuses from one or more centralized kitchens.

In the spring of 2025, the food subcontractor of a large tech company informed the union of their plan to implement a monitoring system on the delivery trucks. The technology includes monitors that measure speed and compare it with local speed limits, sensors that can indicate when the vehicle has had an "incident" (collision, hard breaking, "Hollywood stop," etc.), both cab (driver facing) and external cameras, and GPS that reports to a centralized location. The union along with drivers met with the company and listened to the company explain the technology. The drivers asked very concrete questions about the ways in which the technology would impact their workday.

Over the course of the six-month negotiation period, the company and the workers agreed on a key point: the technology is to improve safety, not to monitor workers. As it is memorialized in the agreement:

> The Parties agree that the primary purpose of Vehicle Monitoring is to improve the safety of the drivers, the vehicles, the product and the general public. The employer is free to review data as they wish for operational improvements and client requested reporting. Data collection is intended for operational improvements and will be aggregated and anonymized to the best of ability. Utilizing the vehicle monitoring system does not replace the need for open and productive communication between management and associates. It is still an expectation that daily issues, concerns or questions are discussed between management and associates**.**

The agreement balances the employer's desire to utilize data with drivers' right to not be surveilled. Data is aggregated and anonymized (without drivers' names). Importantly, in an era where management by app is becoming increasingly common, the agreement mentions repeatedly that the system "does not replace the need for open and productive communication between management and associates," recognizing the importance of direct communication.

The employer is allowed to access vehicle specific information in real time if there is a concern, but management is required to attempt to reach the driver by phone before accessing the monitoring data:

The agreement balances the employer's desire to utilize data with drivers' right to not be surveilled.... Importantly, in an era where management by app is becoming increasingly common, the agreement mentions repeatedly that the system "does not replace the need for open and productive communication between management and associates," recognizing the importance of direct communication.

> It is not the intent of this technology to monitor or surveil associates. However, if Management becomes aware of an issue or concern surrounding the real time location of the vehicle, which may include but is not limited to an incident report or a client complaint, management will investigate as follows: Management will first attempt to reach the driver by phone. If management is unable to reach the driver by phone, management may review the real time location data to locate the vehicle and/or may go to the vehicle to determine the cause.

Similarly, management can only access the real-time cab-facing camera data, "if there is an Incident report, a complaint from the client or a member of the public or a Bona Fide Emergency and the Employer has unsuccessfully attempted to contact the driver by phone and any other regular means of communication."

Building on the agreed rationale of improving safety, when the system generates an incident report (because there was an accident or speeding, etc.), there are two required outcomes. First, management and the driver meet for an initial review of the event. But here too, the goal is improved safety, not discipline:

> Incident reports will primarily be used to counsel and provide training to drivers in order to improve safety. When [the program] generates an incident report, management will meet with the drivers to review the incident. Management will review gathered facts and statements with the [operations] team to determine the appropriate action (e.g. training, coaching, vehicle repair).

When an incident report is generated, a second review is also required. This one requires:

> The Employer and the Union will review the route, workload assigned, and vehicle maintenance to determine if any of those may have been a contributing factor in the Incident. Where route, workload or vehicle maintenance did contribute, the appropriate steps will be taken to address the condition that contributed to the Incident.

The combination of these two reviews means that when an accident or other incident occurs, responsibility for the event is not automatically assumed to be the driver's. The incident is investigated in its totality. For example, if a driver was speeding, was it because there was insufficient time to make a delivery? Was there extraordinary traffic that day and the driver was trying to make up time? In any event, the combination of driver coaching and route re-evaluation is more likely to lead to the shared goal of improving safety than one without the other.

The lead union organizer reported that, "when the idea of this technology was raised, the drivers were very nervous. They imagined this as a method for managers to spy on their every move. Through our negotiations we crafted an agreement that preserves their autonomy and provides us with another way to talk to the company about due process and workload in the future."[42]

Bartenders, Cocktail Servers and Automated Drink Dispensers

The last two cases, housekeepers and drivers, have been examples of labor transformation. There is no loss of jobs (at least not frontline jobs) as a result of the algorithmic management of housekeeping or the vehicle monitoring program. If anything, these particular technologies require an *upskilling* of housekeepers and drivers (prior to the implementation, these positions didn't require any sort of digital literacy). The majority of the technologies that the union has seen in hospitality have been labor-transforming. There have,

however, been technologies that are labor-replacing—where jobs are eliminated. While some technologies actually perform tasks that humans historically did (a robot vacuum cleaner), often among the labor-replacing technologies, it is more correct to say that they are labor-trans*ferring*, since, in reality, they simply transfer the work either to another job classification or to the customer. These technologies, in other words, *deskill* the labor, that is, enable a group of workers (or customers) to perform the work without learning the new skills.

In the face of an employer that is set on implementing a deskilling technology to reduce labor costs, one might fear that technology bargaining would have little practical effect. In one such case in Las Vegas, the unions involved resorted to more traditional strategies to protect workers.

There are two affiliates of UNITE HERE in Las Vegas, Bartenders Local 165 and Culinary Local 226. Local 165 represents bartenders and apprentice bartenders, and Local 226 represents cocktail servers and other non-bartender classifications. Both these locals and the members work closely together.

In 2019, the unions in Las Vegas received notification from an employer about the intention to install an automated drink machine in a casino in Las Vegas. Over the course of the year, this technology would become more popular among the employers, and four additional casino companies informed the locals of their plans to install the devices in their service bars.

In casinos in Las Vegas, Atlantic City and many other locations, complimentary beverages are provided to gamblers. Cocktail servers walk the casino floor taking drink orders and greeting guests. When they have as many orders as they can carry, they head to a "service bar" to place the orders. A service bar is a no-frills affair in the "back of the house" that guests never see. The server places the orders with a service bartender. The bartender then makes the drinks for the server to deliver. The most common liquors and mixers are not poured from bottles but are available through drink dispensing "guns." The guns are connected to tanks and generally have three buttons. An adept bartender will hold an alcohol gun in one hand and a soda gun in the other. The bartender is then able to rapidly dispense drinks.

> *When it came time for testimony in the Culinary's "Combo Jobs" grievance proceeding, meticulous record keeping on the part of cocktail servers allowed them to provide numerous examples in which they didn't just add ice to a drink but also shook, stirred, opened bottles, and even poured drinks when the machines were down. In a series of decisions, arbitrators ruled repeatedly that the cocktail servers were doing bartender work and deserved the higher rate of pay. These awards have resulted in the largest arbitration awards in the union's history.*

From the outset, the union maintained that while the new machines didn't represent anything radically different from the traditional soda and alcohol guns, and that making drinks was bartender work. If the company wanted the bartenders to use the new machine, as opposed to the older guns, the union and the bartenders were prepared to negotiate around the work rules. The companies had a different idea. In essence, they maintained that the new machines were the "bartenders" making the drinks, and that cocktail servers entering drink orders into the machine was no different than those workers telling the bartender the order. At its core the dispute was simply: "is a machine that makes drinks a tool or a bartender?"

There was a lot at stake financially riding on the answer to this question. Service bartenders are among the highest paid job classifications in the union. Because, unlike bartenders who serve patrons directly, service bartenders have no direct access to customer tips, their compensation is higher. Cocktail servers, by contrast, are tipped on almost every drink they deliver, and their compensation from the employer is, consequently, among the lowest of the union job classifications. The employer, then, stood to save considerably by eliminating service bartenders.

The union and the companies met and negotiated but were unable to bridge the philosophical difference, and, after the negotiation period ended, the companies implemented the technology without an agreement and eliminated the service bartender positions. Implementation, however, was not the end of the story. From the beginning, the union saw this as an existential dispute that would define whether or not the job classification of service bartender would survive, and leadership treated it accordingly. Bartenders and cocktail servers were part of the bargaining, and when the companies implemented the new technology, the union recruited worker leaders to document the additional work required of cocktail servers to make drinks ready to serve, as well as other problems with the new system.

The unions filed grievances at the various companies. The International Labour Organization (ILO) defines grievance:

> Workers have rights and entitlements that are established in laws, employment contracts, collective agreements and workplace rules, as well as in custom and practice (the way things are normally done– and have been done for a long time – in a particular workplace, industry or occupation). We say that workers have a grievance when they believe that some aspect of these is not being respected by their employer.[43]

A grievance is handled through the "grievance procedure" that is negotiated between the union and the employer and codified in the collective bargaining agreement. If a dispute cannot be resolved by the grievance procedure, the parties can bring it to arbitration, a quasi-judicial process in which a neutral third party has authority to decide the issue. "The arbitration process is similar to a trial in that the parties make opening statements and present evidence to the arbitrator…After the hearing, the arbitrator issues an award."[44]

Because the two unions represented different job classifications, and because the new technology affected each group differently, they filed different types of grievances. Bartenders (represented by Bartenders Local 165) filed grievances that claimed the employers failed to properly abide by the bargaining requirements of the technology language and were ultimately successful in keeping the operation of the drink machine as bartender work. Cocktail servers (represented by Culinary Local 226) filed grievances pertaining to a different clause in the collective bargaining agreement. The contract requires that when a worker does work in more than one job classification (e.g., cocktail server and bartender during a shift) the employer is required to pay the higher wage rate (the "combination jobs" language— "When an employee works in two or more classifications in any day, he shall be paid for that day at the rate of pay for the highest classification"). The Culinary grievances went to the heart of the employers' potential cost savings. If forced to pay the cocktail servers the same wages as bartenders, the savings from eliminating the service bartender job classification would evaporate.[45] It also went to the heart of the philosophical disagreement. Was the machine doing the work of a bartender or was it a tool to be used by a person doing bartender work?

Cocktails aren't simply a collection of liquids. In addition to pouring the ingredients into a glass, cocktails can be shaken, stirred, muddled, and/or strained. They can be chilled or garnished. Glasses might need special treatments like when they are rimmed with salt for a margarita or sugar for a lemon drop. A tequila sunrise needs to have grenadine drizzled down a spoon to get its signature look. The machine dispenses fluids into a cup. It requires human assistance even to put the cup under the dispenser, much less to add ice to the cup.

Ultimately, the new bartending machines could be described as what Nobel Laureate Daron Acemoglu and Pascual Restrepo refer to as "so-so technology." So-so technologies are ones that are "just good enough to be adopted but not so much more productive than the labour they are replacing." [46] In the Las Vegas casino example, the machines malfunctioned in a variety of ways. Particularly viscous fluids like syrups or sour mix tended to jam the machine, requiring servers to pour them directly or risk getting a "sour shower" when a nozzle became partially clogged.[47]

When it came time for testimony in the Culinary's "Combo Jobs" grievance proceeding, meticulous record keeping on the part of cocktail servers allowed them to provide numerous examples in which they didn't just add ice to a drink but also shook, stirred, opened bottles, and even poured drinks when the machines were down. In a series of decisions, arbitrators ruled repeatedly that the cocktail servers were doing bartender work and deserved the higher rate of pay. These awards have resulted in the largest arbitration awards in the union's history. "The impact of these arbitration awards has been to literally save the classification of service bartender throughout Las Vegas. Faced with the high equipment costs, lower quality product and little to no labor savings, other employers are taking a pass," said Terry Greenwald, the Secretary-Treasurer of Bartenders Local 165.[48]

5. COLLABORATING WITH ACADEMIC RESEARCHERS

From the beginning, UNITE HERE President D. Taylor understood that without a plan to build expertise, the union was going to be at a disadvantage when bargaining over many newly-introduced technologies. Employers had teams that vetted technology before purchasing and received sales pitches from tech companies. The union needed to create an independent source to evaluate the emergent technologies that were appearing. At the same time, Taylor believed worker input was needed in the development of the new technologies. As Taylor put it, "I wanted to have an academic basis and a base that would be supportive of the kind of efforts we were doing and to break through this idea that we were just Luddites just trying to protect workers, and I wanted a stamp of a highly academic institution for the work that we were doing."[49]

Fortunately, the AFL-CIO, led by Rich Trumka and Liz Shuler, had created the Commission on the Future of Work and Unions and was beginning to engage with Carnegie Mellon about the potential for future collaborations. In 2018, the AFL-CIO leadership and CMU, led by President Farnham Jahanian, held a summit in Pittsburgh attended by 30 union leaders and CMU faculty. As a CMU article described it, "the connections that were forged at the summit led to an onsite meeting in Chicago, where Taylor connected a small group of CMU researchers … with some of UNITE HERE's local union leadership from across the country."[50]

Jahanian's vision for the role of the university in tech development and deployment, ("to be the university at the nexus of technology and humanity and the nexus of technology and society") fit well with UNITE HERE's goals. As Dean Ramayya Krishnan, the then-director of CMU's Block Center for Technology and Society, put it, "By building relationships with major corporations, labor unions, government leaders and educators, [CMU]... creates new opportunities for stakeholders — especially those that in the past have felt they need to react to new technologies once they are already in the market — to see what's coming next." [51]

The Chicago meeting brought about further collaboration. Jodi Forlizzi, a CMU professor who is an expert in design and human computer interaction, led the process to build out the research team to include not only technology experts from CMU, but also hospitality researchers from New Mexico State University, labor relations experts from the University of Illinois and Michigan State University and economists from Stockton University. Taylor was willing to trust the process because the academics engaged the hospitality workers as the experts in their jobs. As he put it, "unfortunately, most people who develop technology for the service sector don't feel a need to engage with the people who use their products. We've found that CMU researchers take the voices of housekeepers, servers and other service sector workers seriously and are willing to engage with their concerns." [52]

At the outset of the collaboration, UNITE HERE's Taylor laid out a simple goal for the work, "Our technology program is based on the idea that you can't stop technology, but you can help to shape it. By working with Jodi... and the rest of the team, we are hoping to gain insights into how the technology works and how it impacts our members, so that we can better advocate for technologies and use cases that help make our members' jobs safer and better." [53]

Taylor was clear that the union was not going to outsource the work to the academic team but to collaborate. He assigned Ed Wytkind and this author to work closely with the academic team. In the words of CMU Professor Forlizzi:

> Before this project began, I expected that the union would check in with us a couple of times a year and would be available to help coordinate with workers. Instead, the union reps have been part of the project every step of the way. They've helped with study design, data analysis, and the creation of work products. They've been there to translate union and industry jargon for the academics and academic jargon for the workers. Work like this takes time to show results, and D and Gwen invested significant resources in the form of staff time to making this partnership work. We could not have done this work without the close partnership of the union.[54]

The team of academics and the union applied for and received a National Science Foundation (NSF) grant to study the future of hospitality work.[55] The work has explored algorithmic management in the hospitality sector (the housekeeping programs described above). In essence, the team's research has 1) highlighted the complexity of tech implementation, 2) identified the value in having broad end-user participation both in designing the technology and its implementation, and 3) tested a training program as a method of improving outcomes.

Highlighting the Complexity of Tech Implementation. The complexity involved in transitioning room assignments for a hotel housekeeper from paper records (essentially a clipboard with a list)

to an app-based system comes from the fact that the transition process is not a one-to-one substitution. The app modifies workflows,[56] interpersonal relationships,[57] and power dynamics.[58] It increases job requirements and changes responsibilities.[59] Additionally, "the variability of options within AM systems means that workplace-based configuration, not simply the adoption of the technology, shapes how work processes and worker well-being are impacted."[60] Additional burdens are placed on rank-and-file union leaders, who mediate the implementation.[61]

The team lead, Forlizzi, described some of the complications arising from the implementation of algorithmic management in hospitality in written testimony for the US Senate AI Insight Forums:

> AI can be problematic in this space, because the needs of workers, customers, and managers are prioritized differently. And workers are at the bottom of this list. For housekeepers, algorithmic managers (AMs) increase work, increase job requirements, and decrease worker autonomy. Instead of letting housekeepers clean rooms in the order that makes the most sense to them based on their ability to complete their room quotas with a minimum of wear and tear on their bodies, AMs send them back and forth and up and down in hallways and elevators, while they push 200-300 pound carts. We have heard again and again from housekeepers that the AM "wastes my time." AMs increase wear on the worker by assigning several check-out rooms, which require heavy cleaning, back-to-back as opposed to alternating them with the lighter physical requirements of rooms in which only sheets and towels need changing. Housekeeping is also an entry level job that traditionally did not require technology skills or even fluent English. This, combined with typical connectivity issues, has altered the job of the housekeeper greatly, with little to no increased training or increased compensation.[62]

Hotel decision making is fragmented which adds further complexity to implementation. "In the hotel sector, the ownership of the property, the management of the business, and the brand affiliation can all be with one company, or they can be with separate companies, separating ownership and management."[63] This fragmentation impacts technology procurement, implementation and training decisions—"while a large hotel corporation may specify that hotels franchised by their brand should implement a specific technology, capital investment decisions are decided by the property owner, and the management contract company is responsible for implementation, training, and application. As a result, consistent technology rollout and training are nearly impossible. [64] Day-to-day operational use of the technology is left in the hands of housekeeping managers, not IT experts.

There are then, at least, three sources of complexity. First is the inherent transformation that work undergoes when technology is introduced with all of the disruptions/changes in work processes, relationships and expectations. Second, in hospitality, the technology has to serve the needs of three disparate groups which may not have the same priorities: workers, customers and managers. And finally, the fragmented owner-operator-brand structure in the hotel industry can make procurement and implementation the responsibility of separate entities with very different technology backgrounds and financial incentives.

Identifying the value in end-user participation in design and implementation. To date, the team has proposed and tested two solutions to improve the outcomes (both worker well-being and

efficiency) of the technology: worker participation in the design and implementation of the technology and improved training. Forlizzi described the importance of including frontline worker experience in the design process in her Senate testimony:

> My experience working with UNITE HERE! reinforced the importance of building teams to understand work and how it is affected by new technology. As we explored how hotel guest room attendants use algorithmic managers to move from room to room during their workday, conversations with the attendants themselves revealed one perspective about the work. Talking to their managers who did the room assignments revealed another perspective. Talking to hotel management and the manufacturer of the software revealed additional, sometimes conflicting, perspectives. We need to develop processes to collaborate with workers, planners, and decision makers to surface biases and mitigate them as we seek to achieve better design, development, and implementation around AI and automation in the hospitality industry. [65]

Worker (end-user) involvement should be the norm in developing new technologies.[66] Unfortunately, that is not always the case, especially with service workers. In an early study, the research team demonstrated through prototyping sessions that housekeepers had interesting ideas for ways to improve the program in the critical areas of self-efficacy, transparency and workload.[67]

> *"Unfortunately, most people who develop technology for the service sector don't feel a need to engage with the people who use their products. We've found that CMU researchers take the voices of housekeepers, servers and other service sector workers seriously and are willing to engage with their concerns." –D. Taylor, former UNITE HERE President*

In addition to demonstrating the creativity of frontline workers in terms of contributing to designing technology, the team has also examined the implementation. In a study of union housekeeper leaders whose hotels had implemented an algorithmic management system prior to the midcycle bargaining, the researchers found that the leaders had a *de facto* and ongoing role in implementation. On the one hand, the leaders acted as technical support for their co-workers, helping train them on aspects of the app that their co-worker didn't understand. In interviews, some leaders described how they felt it was their responsibility as the union shop steward or leader to learn the program on a deep level so they could assist their co-workers, especially those who struggled with using devices or navigating the technology in a language other than their own. On the other hand, through both formal and informal channels, the leaders acted as advocates with management to resolve structural or systemic problems with the technology (usage, infrastructure, conflicts with contractual language, and etc.).[68] The work is an important recognition of the role worker-leaders play in technology implementation and a reminder that technology implementation requires adjustments to work processes and routines, especially adjustments which are based on workers' experiences and input.

Testing a training program to improve outcomes. The researchers have also highlighted the critical role training plays. "Vendors and IT personnel [often…] consider the technologies to be intuitive. Yet what is intuitive to a technology professional can seem unsurmountable to a frontline worker who may also struggle with language translation." And it is not just frontline worker training that is needed, "Our research has also revealed that managers may likewise receive insufficient training, particularly as products

receive updates. As we interviewed GRAs, we discovered that many of their complaints about the system were settings that could be changed at the property level. However, management was not aware of these settings, or that they could change them." [69]

Recognizing the need for improved training and interested to see how it would impact workers, the team helped to facilitate a partnership between the developer of the most widely used algorithmic management system, the largest joint labor-management hospitality training facility in the country (Culinary Academy of Las Vegas) and the union local that represents 60,000 hospitality workers in Las Vegas (UNITE HERE Local 226). The training provides students preparing to be hotel housekeepers the opportunity to practice with the technology in a safe, educational environment rather than learning it as part of one's orientation to a new job. As work on this topic notes, "While technology training in the hospitality sector is often designed for front-office and managerial staff, it frequently overlooks operational workers such as housekeepers." [70]

In the words of Ted Pappageorge, the head of the Culinary Union, "This partnership is an opportunity to provide housekeeping trainees with better understanding and skills and gives workers an opportunity to be better prepared in job training and job placement, and to support in worker retention efforts."[71] The results have been promising. Housekeeping trainees expressed greater confidence in their ability to use the technology, and deeper understanding of the utility of the program, or as one of the researchers wrote, "tailored digital training programs enhance employees' ability to adopt and interact with digital tools." [72]

In many ways, the collaboration has played out the way in which Taylor hoped it would. The research has identified the complexities of the technology, as well as a roadmap for ways to ameliorate adverse impacts. Combined with the bargaining language, it has enabled the union to develop the bargaining positions illustrated in the previous section.

6. TECHNOLOGY FOR WORKERS

Our last case is different from the others in that it is an example of the union working with a technology developer rather than responding to an employer's desire to innovate. In addition to fulltime employees, in hospitality, an employer may need additional staffing as a result of a large special event, vacations or illness. In such a case, the employer can utilize a "union hiring hall," a system where the union matches eligible workers with (temporary) job openings.

Taylor describes realizing the need to update the union's hiring hall as a result of negotiations in 2013,

> Our hiring hall was obsolete. And I had seen workers with the app on their phone.... And we were having negotiations in 2013 ...and all of a sudden these workers come in to clean up [that we didn't recognize, so we asked the employer and it turns out] they were subs [temporary non-union workers doing bargaining unit work] and [the employer] said, 'we couldn't get anybody out of the union,' blah, blah, blah. I knew that was bullshit. So, we negotiated language about union scale, but what we really figured out is we got to have a new [high tech] hiring hall.[73]

The language that the union negotiated in 2013 in Las Vegas required employers to pay the same wages and benefits to temporary workers as regular employees. In Las Vegas, benefit contributions (healthcare and pension) are paid on an hourly basis. The 2013 language meant that using a temporary staffing company wouldn't save on labor costs for the employers.

While the seeds for a new approach to the hiring hall were planted in 2013, it took years, the move of the NFL Raiders to Las Vegas and the COVID-19 pandemic to transition to a digital hiring hall in Las Vegas. In January of 2020, Taylor directed union staff to begin planning for the move of the Raiders football franchise from Los Angeles to Las Vegas. In Taylor's vision, underemployed union members would be able to use an app to pick up shifts at the stadium, pick up extra income and "make their hours" (achieving health insurance eligibility).[74] That same month, a group of former Caesars casino executives approached Taylor with essentially the same idea—an app, called Goodwrx, that would match open, temporary positions with workers looking for more work.

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While the concept of an app to fill temporary open positions is not unique, the business model is. Goodwrx is a temp company paying union-scale wages and benefits. Instead of making money by charging the worker for the service of matching workers to work, Goodwrx charges the employers.

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Beginning in February 2020 and then virtually throughout the first couple of years of the pandemic, staff from the Culinary Union in Las Vegas and UNITE HERE International worked with representatives from Goodwrx on a number of essential tasks required for the success of the app. First, a team of elected leaders and staff from the union worked with app developers to make sure that core aspects of union collective bargaining agreements (wages, job rules, and benefits) and related rules (seniority, no-call no-show policies, etc.) were correctly programmed into the app. Second, union organizers and communications staff recruited workers to sign up for the app and helped with training on the use of the app. Third, union leadership connected the Goodwrx team with executives at leading employers and endorsed the Goodwrx app as a replacement for the union hiring hall that previously helped fill temporary shifts. As Culinary Union Secretary-Treasurer Ted Pappageorge explained in 2022, "there isn't a shortage of workers, there is a shortage of good jobs with benefits and wages, and that's why the Culinary and Bartenders Unions negotiated with covered employers and Goodwrx for temporary employees to get strong union wages, health care benefits, and protections."[75]

In a world where employers and customers increasingly require on-demand staffing, the Goodwrx program shows how to guarantee a union standard in filling those jobs. The app works by pairing workers with available shifts. To sign up, a worker first downloads the app and fills out a brief questionnaire to see which jobs they are eligible for and when they are available. The worker uploads required documents (W-4, I-9, etc.) to get registered in the app. The employer posts a shift, and the shift is offered to those workers who are eligible and available at the time the job is offered. The worker then either accepts or rejects the shift. Workers receive union-scale wages and benefits. Employers benefit by having access to trained union employees to pick up shifts when there is a surge in demand or a labor shortage. For the union, the app frees up resources that might have been used to run a union dispatch. As Goodwrx CEO Nathan Armogan said, "[what] we are trying to do here at Goodwrx is... to create a gig economy alternative that embraces the values of equity and labor empowerment."[76]

By March of 2026, Goodwrx had paid out almost $20 million in wages and $4 million in benefit contributions. Currently, Goodwrx operates in three cities and is in conversations to expand.[77]

7. CONCLUSION: LESSONS LEARNED AND RECOMMENDATIONS

Early studies predicted widespread job loss in the hospitality industry. Those losses have not materialized. Whether the predictions were incorrect as a result of a failure to analyze the economics and decision-making structure(s) of the industry, or whether the COVID-19 pandemic created a temporary delay, is yet to be seen. While future years might bring additional change, at this point, there are six main lessons UNITE HERE has learned in the first seven years of the technology program.

A. In order to have a successful technology program, the union needs to dedicate resources. It is worth stating the obvious. Without dedicated resources to educate and train workers and staff, to participate in and facilitate research, and to bargain with the employers, UNITE HERE's program would not have advanced as far as it has. The commitment of the International Union under both D. Taylor and his successor, Gwen Mills, has created a centralization of institutional experience and knowledge that has served the union's goals.

As Taylor puts it "I think the biggest thing on technology... is you have to bird-dog it. And as you know, it's like anything, if you take your eye off of it, all of a sudden things are gone. As I always say, a contract language is paper. Paper doesn't walk in and make an argument or do anything. You need people to do that."[78]

B. Hospitality employers tend to be tech purchasers rather than tech developers. This dynamic means that the developer's primary audience is a hospitality company executive who has limited knowledge about technology but does have purchasing power. The developer designs the technology for what he assumes is the interest of the employer (increase revenue, decrease labor costs, etc.), but the ultimate success or failure of the technology is in the hands of the workers who use it.

I. Because of this triad of frontline workers, purchasing executives and developers, technologies are primarily designed with management's perspective in mind rather than the end-users' (frontline workers), which can limit the effectiveness of the technology.

II. Greater input from frontline workers in the development process would likely improve the effectiveness of the technology as well as worker well-being.

C. The reasons for implementing technology are complicated. While some labor advocates, academics and politicians assume that the only/primary reason to implement technology is to reduce labor costs, employers have many other reasons for turning to technology: increasing revenues, improving efficiency, and preserving assets. For example, food orders placed via mobile ordering or a kiosk tend to be around 20% larger.[79] Having multiple kiosks or ordering options decreases the number of people who see a long line and opt for a different dining option, further increasing revenues. In the case of McDonald's, the market leader in kiosk utilization, "you may think that McDonald's self-order kiosk may have replaced all the restaurant staff with kiosks since it's so convenient, but no, McDonald's retained all the employees working in franchises behind the counters and those working the floors as well" according to a post analyzing the impact from *WaveTec*.[80]

In the case of the vehicle monitoring program that was discussed above, there was no labor savings. The program was implemented in order to gain better insight into location of the vehicles and to have a better record of potential issues with those assets. Similarly, the union negotiated over a technology that tracks pool towels at resort hotels. The technology did not reduce the number of pool attendants. It was introduced in an attempt to stem a substantial loss of towels. The algorithmic management system in housekeeping doesn't reduce the number of housekeepers, but it does create back-office efficiencies and improves communication for the employer.

When unions recognize that all technology is not designed to replace, monitor or discipline workers, it opens the door to negotiations that have the potential for a "win-win" situation with the employer—for example, a kiosk/mobile ordering at a restaurant might result in increased revenues for the employer and more paid work hours for employees.

D. The work to understand the potential impact of technology is detailed, industry specific, multidisciplinary and, most importantly, necessary. Many reports claim to estimate the impact of automation on work, though most of those focus only on job (or task) replacement.[81] As economist David Autor has written, "journalists and even expert commentators tend to overstate the extent of machine substitution for human labor and ignore the strong complementarities between automation and labor that increase productivity, raise earnings, and augment demand for labor."[82]

I. Most jobs are a collection of tasks, and most newly-introduced technologies are designed to do only one of those tasks. A housekeeper, for example, vacuums, dusts, cleans bathrooms, restocks toiletries, changes linens and towels, makes beds, etc. At this point, the only technology that could do all of that only exists in the realm of science fiction, like something out of the *Jetsons*. As a consequence, in hospitality the impact is more likely to be in transforming work, but this often gets missed in the discussions about technological impact.

II. Even if a particular technology can perform a task, that doesn't mean that economic, social and organizational factors all align to make implementation inevitable. As Feigenbaum and

Gross chronicle, it took 90 years for AT&T to fully transition from human telephone operators to mechanical switching.[83]

III. As Autor correctly explains, "Most work processes draw upon a multifaceted set of inputs: labor and capital; brains and brawn; creativity and rote repetition; technical mastery and intuitive judgment; perspiration and inspiration; adherence to rules and judicious application of discretion. Typically, these inputs each play essential roles; that is, improvements in one do not obviate the need for the other."[84]

IV. The default should not be to assume that every technology is going to replace workers. The work to truly understand the implications requires, at the very least, understanding the technology and its strengths and limitations, the social and organizational framework of the work and the financial structures and implications in a particular industry.

E. When negotiating over new technologies, it is critical to understand both the technology and the ways in which the work processes change. One of the underlying principles of UNITE HERE's technology program has been to understand the technologies being implemented at least as well as the employer.

I. Technology is not implemented in a vacuum. Patterns of work, efficiencies and procedures are already in place. Those factors have to be taken into consideration to minimize operational disruption and confusion. For example, in the case of mobile ordering of alcoholic beverages, when is age verification performed? Traditionally it has been done before putting an order into the system which avoids the need to cancel the order if a guest cannot prove she is of legal age. If verification happens *after* the drink is made, then multiple actions need to take place to remove the drink from the patron's bill, chronicle the wasted drink, and deal with the disappointed guest.

II. In an effort to minimize the disruption of new technology, UNITE HERE includes worker-leaders in bargaining. Those leaders understand the current workflows and can identify potential points of friction. This is painstaking work, but necessary for successful implementation.

III. No technology is an island. Technology is embedded in work settings and must be integrated with the humans that work with and around the technology. The input of those workers is necessary to optimize new innovations to benefit workers, employers and customers.

F. Implementing technology requires a commitment to training. Successfully implemented technology would hit the trifecta. It would provide a benefit for the employer; it would improve the guest experience; and it would enhance worker well-being. Those benefits are unlikely to be realized without effective use of the technology.

As the UNITE HERE Local 26 President wrote in testimony before the US Senate Health, Education, Labor and Pensions Committee:

> While developers usually advertise that their product is 'intuitive,' in our experience, what is 'intuitive' for a software designer rarely is for a front-line worker. To get the most out of the program and for workers to not feel additional anxiety and stress from the program, they need regular training that takes into account their lived experience as frontline workers, and regular dialogue about the future development of the technologies they use in their work.[85]

It is not just frontline workers who need regular training. Managers also need to have excellent digital skills in order to take full advantage of the potential benefits and to avoid potential pitfalls or clumsy or ineffective use of a newly-introduced technology.

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Eight years into the project, technology is still not "static," as Taylor puts it. The union continues to negotiate over new technologies and to expand the number of workers covered by the midcycle bargaining language. Reflecting on the work, Taylor commented:

> We looked a little bit in the future and decided to not just be reactive. I am proud of that and that we convinced a lot of people in our own union that this was worth fighting for. And I always say, you can always tell when something's worth fighting for with employer resistance, and they always have real resistance.
>
> So that's number one. I think that's important. Lessons learned is a few. One, you've got to have somebody at your local or something to keep watch over this, and you have to have … people understand the trends, understand what is occurring… And also you've got to have a process that evolves.[86]

On April 1, 2024, Taylor stepped aside as UNITE HERE's president. Taylor's successor, Gwen Mills, has been involved with technology bargaining for several years. In 2023, she was one of the leaders of the Detroit Casino workers' strike that led to the addition of the technology bargaining language in those contracts.[87]

Reflecting on first few years of the program, Mills summarized:

> We live in a time when the richest people in the world are looking to further consolidate their wealth and power, and they are using tech to do it. If you listen to Silicon Valley, tech is always perfect and inevitable, and those of us who raise concerns are anti-progress. Almost a decade ago, President Taylor recognized that without worker input, tech innovation was just going to line the pockets of billionaires at the expense of normal working people.
>
> We still have a long way to go to achieve technological innovations that uplift all humanity rather than benefit a few, but I believe that we have a model of how to get there. As our program evolves, and it must, because technology is evolving, we are holding on to that core vision—workers must be part of the design and implementation of technology.[88]

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Endnotes

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2 Chiang (2023).
3 See Langdon Winner's pivotal article on the topic in which he writes, "Those who have not recognized the ways in which technologies are shaped by social and economic forces have not gotten very far," Winner (1980).
4 Midcycle bargaining refers to negotiations that occur with unions and management before a bargaining agreement expires, or between new union contracts.
5 See Feigenbaum (2024) on the almost 90-year process that eliminated telephone switchboard operators at AT&T.
6 Juravich (n.d.), p. 1.
7 Frey (2017)
8 Manyika (2017)
9 Muro (2019).
10 LVRJ (2019).
11 C.f. AFL-CIO (2019).
12 Dam (2019) emphasis added.
13 Juravich (n.d.), p. 2.
14 Interview with D. Taylor, 3/4/2026.
15 UNITE HERE represents workers in casinos, hotels and industrial food service. The technology language has currently been added to all of the major employers in each of the industries. And while 90-95% of the language is identical across the three industries, there are variations.
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28 This language, with some variation, appears in all contracts.
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