AMANDA BALLANTYNE, JODI FORLIZZI, AND CRYSTAL WEISE

A Vision for Centering Workers in Technology Development

Including union perspectives in research and development is essential to building effective, equitable technology and public trust.

Artificial intelligence has been hyped in the media and in workplaces, especially since OpenAI released ChatGPT in November 2022. In the workplace, AI systems can be used for hiring, disciplining, and firing workers, as well as task assignments, scheduling, and evaluations. AI can also accelerate existing trends in automation and robotics. A 2023 US Census Bureau analysis of 2019 data showed that nearly 30% of all workers, and more than 50% of manufacturing workers, are exposed to technologies that automate tasks. This level of exposure has fed widespread anxiety: 70% of workers are worried about job displacement by AI, according to 2023 polling released by the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO), a federation of 60 unions representing more than 12.5 million working people.

New technology can solve problems or worsen them. Choices around how technology is used determine whether it augments or disrupts workplaces and other social arrangements. AI, machine learning, robotics, and automation in the workplace can exacerbate inequality at the office or the factory and widen economic and political disparities in society more broadly. Technological innovation is shaped by the incentives and policy choices of the public research and development ecosystem.

Workers should have a say in the choices that determine how technology affects their workplaces—and the world.

The public research and development system that drives technological innovation has so far failed to include a crucial group of experts and end users: the workers. Leaving these important stakeholders out of the innovation process can harm workers, increase inequality, widen economic disparities, and inhibit development and acceptance of technology. Workers' voices are a crucial resource for making innovative technologies trusted and effective, so their full benefits can be realized for society. And, of course, workers are taxpayers who underwrite the nation's investments in research and development of new technologies.

Publicly funded R&D of AI and automation must include partnerships with workers. Worker-centered R&D, an approach that consults workers about their needs and experiences through their unions, can give labor a voice in technological design, development, and deployment. Workers are experts in what they do and what they need, and their perspectives could improve AI technology in many dimensions, from efficiency to equity to safety to worker well-being. Unions are involved in partnerships across multiple sectors that could fundamentally change the trajectory of AI technology.

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Properly scaled, these strategies are key to ensuring that the benefits of technology are broadly shared and outweigh the harms of innovation. Smart labor-management partnerships and changes in public research investment policies can build upon this momentum.

Considering Worker Needs

Taxpayer-funded R&D is essential to the innovation ecosystem. This funding, an estimated $200 billion in 2022—including $1.75 billion on nondefense AI R&D—takes many forms, including grants, loans, government contracts, postdoctoral fellowships, and public-private partnerships. However, even though workers underwrite the system with their tax dollars, they are often left out of the research it funds. Failing to center the process and outcomes of innovation on the people who fund it can have negative consequences.

History has shown that careless implementation of automation can eliminate jobs and de-skill occupations. For example, hospitals have used remote monitoring equipment to replace skilled nurses with less-skilled workers. Implementing technology without worker input can also reduce autonomy and job satisfaction. A study of industrial robots across 14 industries and spanning 16 years found that workers who had a degree of control over robots expressed a greater sense of agency and competence in their jobs and felt more connection to their co-workers than those with less operational roles. Furthermore, implementing workplace technology without centering workers can erode occupational health and safety, disempower and undermine the economic stability of workers, exacerbate economic and racial inequality, and even place the public at risk.

Technological advancements in AI without appropriate policy guardrails could lead to significant job loss, much as misguided free trade policies have over the past 40 years. But progress and innovation don't have to be at the expense of workers or their communities, accruing benefits to a narrow portion of society. Instead, a new path can be forged in which shifts and disruptions are navigated more inclusively, and the benefits enjoyed more broadly.

History shows that involving workers can positively shape how technological change unfolds in an industry.

The telephone industry is a prime example. In the 1940s, telephone operators handwrote the billing records for calls. However, when telephone companies introduced automatic billing using punch cards, telephone operators were not displaced. Unions and the industry trained workers to operate new technology—early computers—allowing them to benefit from technological shifts in the workplace.

Involving labor unions in research and development can also help to ensure that society at large benefits from technological shifts and disruptions. In the process of early electrification, unions were instrumental in making electrical infrastructure significantly safer and more efficient. In particular, the International Brotherhood of Electrical Workers played a significant role in shaping electrification policies and standards in the Tennessee Valley Authority.

Benefits of Worker-Centered R&D

Although workers are often best positioned to identify potential risks, practical limitations, and unintended consequences of a technology in real workplace settings, today a majority of workers do not have as much say as they'd like in new technology on the job, leading to what has been called a "voice gap." However, tested methods are available for including workers' perspectives during AI development and implementation.

One path is through partnerships between university researchers and unions. This type of collaborative research seeks to better understand how emerging technologies can improve efficiency and job quality at the same time. For example, a collaboration between Carnegie Mellon University, the AFL-CIO Tech Institute, the Transport Workers Union, and the Amalgamated Transit Union is studying bus driving and automation. Although autonomous shuttle and robotaxi companies have announced ambitious plans to replace human operators, today these systems still rely on remote human intervention. From 2021 to 2023, in the United States and Canada, bus drivers shared their expertise with policy and engineering professors. These drivers stressed that

operating buses requires adapting to quickly changing circumstances on the streets—including traffic, snow and flooding, and construction—and navigating when the connection to GPS data is lost. More importantly, a bus driver's job involves working with people: helping riders with medical and safety emergencies, assisting older passengers, and giving directions. To ensure accessibility and comply with the Americans with Disabilities Act, bus drivers also often help passengers with disabilities. The resulting 2022 white paper concludes that even if autonomous transportation is technically feasible, it cannot replace human drivers' many roles in complex passenger transportation systems. This research is being used to design new strategies for safety, emergency response, and social support on buses.

Missed opportunities to incorporate consultations with workers in the development of safety protocols for automated vehicles show the cost of inaction. There have been examples of autonomous robotaxis

However, this research revealed that the app did not consider the distance traveled between rooms or the physical effort required for different cleaning tasks, which meant its assignments could make workers less efficient. Hotel cleaners and housekeepers often push a 200-pound cart across massive buildings and do heavy physical labor. Rather than allowing workers to determine the best flow of work, the algorithm made the work more difficult while also diminishing the workers' autonomy and agency.

Employee feedback via labor unions led many hotels to reconsider workers' agency in working with their room assignments. But the study further engaged workers in prototyping sessions to imagine ideal versions of the technology that could improve transparency, workload, and ultimately worker well-being. Participants in the sessions suggested better mechanisms for communicating with supervisors and managing workload, including design features to prevent management from over-assigning workers.

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disrupting traffic, blocking first responders, and even dragging a pedestrian. Had passenger transportation service workers been involved in evaluating the feasibility of deploying fully autonomous vehicles, these highly trained professionals could have warned against substituting the judgment of humans with robotic vehicles that lack the capacity to respond safely in the complicated, often unpredictable operating environment of the transportation system.

Worker input is also productive in the many industries that use algorithms to manage or assign workers' tasks. For example, large chains in the hospitality industry often use algorithmic management platforms to coordinate housekeeping services by directing workers and supervisors. In an ongoing study, researchers from Carnegie Mellon, several other universities, and UNITE HERE, an international labor union affiliated with the AFL-CIO, are looking at the effect of algorithmic management on employees' tasks, relationships, and well-being.

These algorithmic management programs routinely assign cleaning to workers according to guest priority.

Another promising method of incorporating worker-centered R&D is through partnerships with technology companies. In 2023, the AFL-CIO and Microsoft signed a partnership agreement to incorporate worker voices in AI technology development. This labor-tech partnership will foster open dialogue about how AI can anticipate workers' needs and include their voices in its development and implementation. Additionally, the agreement includes a neutrality framework confirming "a joint commitment to respect the right of employees to form or join unions, to develop positive and cooperative labor-management relationships, and to negotiate collective bargaining agreements that will support workers in an era of rapid technological change."

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Supporting Worker-Centered R&D

As AI technology evolves, it is essential that workers' perspectives are incorporated into publicly funded AI research infrastructure, grantmaking, and datasets,

including research on how AI technology is being used in the workplace and its impact on workers.

First, public R&D investments in technological innovation should require grantees to partner with labor. The federal government has already taken the first steps along this path. The 2022 CHIPS and Science Act requires the National Science Foundation (NSF) to ensure that its programs incorporate workers' perspectives by partnering with labor organizations. In addition, the Economic Development Administration's Regional Technology and Innovation Hub Program requires involvement of labor or workforce training organizations, so that workers will be at the table where decisions are made about how to spend $504 million for regional innovation.

This September, a major advance built on these successes. NSF, the AFL-CIO, and the AFL-CIO Tech Institute signed a Memorandum of Understanding committing NSF to collaborate and engage with workers and their unions in emerging technology

have access to data about demand for occupations and tasks via new hires and job vacancies, types of technology in the workplace, and the tasks they are used for. Better data on the job market at the regional level are also needed. The Bureau of Labor Statistics should produce regular updates of its July 2022 report on growth trends for selected occupations considered at risk of disruptions from AI, automation, robotics, and other emerging technologies. Furthermore, revisions to survey methodology, expansion of existing surveys, updated software tools, and creation of a job task classification system could help provide a deeper and more accurate understanding of the impact of technologies across jobs and sectors.

More broadly, policymakers should pass legislation that protects and expands workers' rights to collectively bargain. Creating a policy ecosystem that empowers workers and supports more unions is essential for weathering this era of technological change; such measures ensure workers can effectively

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areas. The memorandum provides a structure for sharing information about NSF's funding priorities, as well as coordinating programs, outreach, and science and engineering education. This commitment recognizes workers and their unions as major stakeholders in federal innovation R&D programs. More agencies funding AI R&D should follow this example.

Second, science funders should incentivize companies to work collaboratively with labor organizations and workers. For example, research grants could promote capacity building for university-labor relationships, much like the one with Carnegie Mellon and the AFL-CIO. Such partnerships could be accomplished by allowing grant funding to be used for capacity-building expenses to strengthen systems, processes, administration, and operations.

Third, better data are needed to identify and prioritize which workers are most affected by emerging technologies. Currently, companies are not required to publicly report the demographics or job classifications of their workers. As a result, policymakers do not

advocate for and participate in shaping the technology that becomes part of daily life.

As policymakers look to the future, they may be guided by the knowledge that technologies are shaped by who is included and empowered in the development process, by the stories people tell about the past, and by what they can envision for the future. Better outcomes are possible by including workers in designing, developing, and deploying technology. Worker-centered R&D holds incredible promise—with the right policy interventions to support it.

Amanda Ballantyne is the executive director of the AFL-CIO Technology Institute and the AFL-CIO Working for America Institute, and serves as a strategic advisor to AFL-CIO president Liz Shuler. Jodi Forlizzi is a senior advisor for the AFL-CIO Technology Institute and the Herbert A. Simon Professor in Computer Science and HCII and associate dean for diversity, equity, and inclusion in the School of Computer Science at Carnegie Mellon University. Crystal Weise is the innovation policy advisor for the AFL-CIO Technology Institute.