An MIT Exploration of Generative AI • From Novel Chemicals to Opera

Bringing Worker Voice into Generative AI

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ABSTRACT

The purpose of this article is to identify ways to bring workers' voices into the development and use of generative artificial intelligence (AI). Drawing on more than fifty interviews we conducted, we identify lessons new deployments of generative AI tools can take from research on worker voice to ensure that the adoption and use of generative AI is beneficial for workers, organizations, and society. Evidence from recent interviews and past research indicates that input from workers can increase the likelihood that organizations use generative AI tools effectively *and* workers' job quality improves. The evidence collected also suggests that generative AI is particularly well-suited to "bottom-up" development and use based on workforce experimentation. Moreover, we document the growth in labor union interest in and capacity for collaborating with business, developer, and academic institutions, negotiating new collective bargaining provisions governing use of AI, and educating their members on these issues. We then discuss how workers can be involved throughout the technology development and implementation process. Our recommendations outline steps for ensuring that generative AI will both drive innovation and help shape the future of work to the benefit of all stakeholders.

Keywords: worker voice, generative artificial intelligence, participatory design, union engagement, bottom-up innovations

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1. Introduction

Recent developments in generative artificial intelligence are sparking vigorous debates about how these technologies will affect the future of work.[1] Yet there is often a voice missing in these debates: workers and their representatives.

Why is this a problem? As Daron Acemoglu and Simon Johnson point out in their recent book on the history of technological change, leaving workers out has contributed to inequality; investors and firms that control a new technology reap the benefits while the workforce bears the costs.[2] Moreover, research has found that integrating technological changes with changes in work processes and incorporating end users into technology development and implementation produces better results than top-down processes that focus on technology alone. Employees can offer improvement ideas in the process of technology implementation, a phenomenon called ‘‘giving wisdom to the machine.”[3] Decades of research, much of it conducted at MIT, confirms this finding in industries from IT to health care to manufacturing.[4]

The objective of this report is to incorporate workers' perspectives into the discussions about how to use and govern generative AI, alongside the perspectives of other stakeholders. We take a broad approach to the forms and levels of workforce voice that need to be considered, including individual workers, groups of workers and managers within organizations, unions that represent workers, workers in consultative forums that also include other stakeholders, and public policies regulating AI.

Our primary new data collected for this report comes from more than fifty interviews conducted with a diverse cross-section of influential stakeholders, including AI developers, business leaders, labor leaders, government leaders exploring how to regulate AI, and experts in academia. Interviews ranged in length from thirty minutes to an hour. Most were conducted in the fall of 2023, but some were conducted earlier. Our interviewees spanned a wide range of industries, and interviewees were guaranteed that their statements would not be attributed to them without their consent. We coded the interview transcripts for relevant themes using Dedoose coding software.

2. The Context

Recent research on generative AI,[5] including studies of the use of generative AI in customer service[6] and consulting,[7] has shown that workers' use of generative AI can yield substantial gains in productivity, work quality, and creativity. But research has also found that generative AI raises new challenges related to the technology's unexpected capabilities in creative, analytical, and writing tasks[8] and in skill leveling,[9] as well as its potential to decrease performance and generate incorrect solutions if used for tasks beyond its current capabilities.[10]

This project builds on prior research and educational efforts at MIT and elsewhere that have focused on how emerging technologies from robotics to earlier forms of AI are affecting work and will continue to do so. Among the key findings from that prior work that inform this project include:

- Technologies do not evolve deterministically. They are shaped by the people who use them and the organizations that guide how they are used. This provides opportunities to use technologies in ways that can serve different objectives and interests.[11]
- AI and other technologies are often viewed as being on a continuum from labor-displacing to labor-augmenting.[12] In recent years, debates over the effects of such technologies have shifted from the question of how many **jobs** will be eliminated or created to how new technologies change the mix of **tasks** that make up jobs and the skills jobs require.[13]
- To achieve the best results, large-scale technological or digital transformation projects require effective management of organizational change. As suggested above, the processes of implementing new technologies work best when combined with the redesign of work processes in ways that draw on workers' knowledge.[14]

3. What AI Developers and Other AI Experts Say

We interviewed twenty-two AI experts, including both AI developers in the private sector and academic experts. There is currently an active debate in the AI development community over whether generative AI tools are designed primarily to replace human intelligence and labor or to complement human work. A number of our interviewees, along with published works by scholars,[15] suggest that there is a bias toward labor displacing/replacing humans in the minds of many inventors or technology vendors. As one investor in AI startups and larger enterprises stated:

> [T]he vast majority of what I see in terms of artificial intelligence development is labor-replacing as opposed to labor-augmenting.

Another expert working within a large AI development firm reinforced this view by pointing out that time pressures to bring AI products to market quickly work against incorporating worker input.

Yet within the AI development community this worker displacement issue is subject to debate. This debate has led some developers to initiate projects that focus on using generative AI to address critical societal challenges. For instance, the Beyond the Imitation Game benchmark (BIG-bench) involves a large team of AI researchers that enlists academics to suggest problems within their disciplines that generative AI might address.[16]

In addition, colleges and universities are developing and offering AI courses that use participatory design principles; participatory design entails prioritizing the needs and experience of end users through the development cycle of a system or product and emphasizes active involvement and collaboration between designers and a diverse set of stakeholders. At MIT's Schwarzman College of Computing, for example, the Social and Ethical Responsibilities of Computing (SERC) program was established in 2019 to train students to practice responsible technology development.

SERC brings together faculty across disciplines, ranging from engineering to management, the humanities, and social sciences. Faculty collaborate with external stakeholders to teach students to critically explore the implications of AI tools, engage with a broad set of stakeholders as part of the conception and development of AI algorithms and systems, and connect technical content with the social consequences of design decisions. Course materials from SERC are made available freely worldwide on MIT OpenCourseWare.[17]

Participatory approaches to AI design and development are also increasingly emphasized in teaching, research, and policy efforts beyond MIT. The Organisation for Economic Co-operation and Development (OECD) is advancing a participatory AI framework,[18] as is the National Institute of Standards and Technology.[19] Educational and research programs at institutions such as the University of California San Diego Design Lab and Carnegie Mellon University's Human-Computer Interaction Institute emphasize participatory design practices for AI systems.

An innovative new example of involving stakeholders in discussions of generative AI is a recently announced partnership between Microsoft, the AFL-CIO (American Federation of Labor and Congress of Industrial Organizations), the American Federation of Teachers, and the Communications Workers of America. The agreement stipulates that (1) Microsoft will share information about AI developments to help workers understand the technology and anticipate its future, (2) labor will connect Microsoft developers with worker voice and experiences regarding opportunities and challenges related to AI in the workplace and how AI can improve work, and (3) together Microsoft and labor will explore policy initiatives and other strategic partnerships that provide workers with the skills to succeed as AI evolves.[20]

As we will discuss below, development and experimentation with generative AI can often involve "bottom-up" processes involving end users who experiment with these tools to improve the way they do their jobs. This "democratization"[21] feature of generative AI opens up possibilities for the workforce to exert greater influence in how the technology evolves than was possible during many prior technological changes.

4. What Business Leaders and Organizational Change Experts Say

Deployments of generative AI tools are still in their infancy. More than twenty interviews with business leaders helped identify the types of early use cases companies are pursuing, as well as how workers' roles might be affected. In our interviews, business leaders identified three main categories of generative AI use cases: i) **productivity** use cases where workers use generative AI to complete a task at greater speed; ii) **decision support** use cases where workers use generative AI to navigate a complex task with greater skill; and iii) **creative** use cases where workers use generative AI tools as part of an innovation process.

Employers have described several key decision points as they begin to integrate generative AI tools. Each decision point presents opportunities for worker input: i) governance; ii) use case identification; and iii) implementation and work redesign.

i) Governance. The first decision point is around the legal, security, and regulatory governance of generative AI tools within the organization. At many employers, particularly large firms, the first reaction to the release of ChatGPT and other large language model (LLM) tools was to restrict their use on company networks—and to prohibit using proprietary data as an input to the model. After taking this initial defensive measure, many employers established task forces to decide what information can be shared and within what guidelines. In limited cases, these guidelines have been formed with input from early users of the technology who have identified ways that these tools could be beneficial to their work. Soliciting ongoing input from workers on how these tools may be used *productively* and *responsibly* can inform how companies develop their AI use guidelines—and flag potential risks that the legal team alone might not have anticipated.

ii) Use case identification. In some organizations we interviewed, there is a top-down approach to identifying new use cases for these technology tools. Managers with technical skills are allocated a budget to identify and invest in promising use cases for the technology. Once a use case is selected, workers may have input in how

the technology is used—and their workflow reengineered—but the decision about where and why to use the technology comes from the top down. Some companies take a "task force" approach to developing use cases, where they bring together leaders from different business units to identify high-value business problems where LLM-based technologies can generate benefits for the company.

An alternative, bottom-up approach is also underway in some organizations. This approach identifies use cases by providing training on the technology's capabilities—or access to pilot technology tools—to a broad cross-section of workers. The organization then solicits ideas from workers on what use cases they think could be the most productive. In this method, the bottom-up feedback develops a library of potential use cases for the organization to evaluate and pursue.

In organizations using a bottom-up approach, business leaders face a challenge in balancing top-down business priorities and bottom-up energy for augmenting certain tasks that frontline workers are eager to transform. The bottom-up and top-down approaches are not mutually exclusive but can be two complementary aspects of identifying the most promising ways of using generative AI.

iii) Implementation and work redesign. The third decision point occurs during the implementation of a generative AI application. The generative AI applications discussed in our interviews often include isolated tasks that are part of a broader business process. For example, one pilot project at a large corporation includes implementing a generative AI tool to perform one task that constitutes a small part of one or two individuals' jobs on any customer service team. The question in such cases becomes: how do the teams responsible for those tasks reorganize their work in the wake of generative AI? Given workers' direct knowledge of their workflow and the task at hand, this is an area where worker input is critical and natural to include in the redesign process.

Since many organizations we interviewed have been cautious in rolling out generative AI applications—introducing new tools to one or several teams at a time—there is opportunity for feedback from early users to shape how the tools are modified as they scale through an organization. It is an open question, however, whether all workers have the language and preparation to describe how changes to their workflow can improve their job quality, since so much of their job-related knowledge is tacit. Moreover, some workers lack sufficient trust that providing this information will not be used to take away their jobs.

5. What Labor Leaders Say

We conducted eight interviews with labor leaders from a range of industries. An additional five interviews were conducted with AI researchers studying how AI affects workers. We also met with groups of labor leaders and other AI experts and labor educators at several conferences to gain their perspectives on and experiences with generative AI use.

Labor leaders we interviewed and met with noted that workers and their unions recognize they cannot simply resist use of generative AI any more than they could resist prior waves of new technologies. However, they are eager to negotiate and collaborate with employers, AI vendors, and policymakers in shaping how generative AI can be used to improve the quality of workers' jobs. One put it this way:

> When you're talking about technology adoption in the workplace there is a necessary partnership between the employer who's trying to put the technology in and make it work and the workers who actually have to work with it and work around it. That's the kind of collaboration that can happen really effectively with a union…Not [unions] saying, “Hey, we’re going to keep this technology out”… But to say, “That has to be a partnership.”

Workers themselves want to engage employers in how generative AI will be used. One recent survey found that workers’ top priorities with respect to AI are for (1) greater communication and transparency on how these new tools will affect their job, (2) more training in building the skills needed to use them effectively, and (3) a voice in shaping how the tools will be used in their organization.[22] A recent study of call center workers and AI tools found that workers voiced approval for use of the tools to help them better serve customers and be more effective but responded negatively to use of AI tools to monitor and control their working time and work processes.[23]

Many of the labor leaders we spoke with agree that the possibilities of bottom-up experimentation open up opportunities for generative AI to improve the quality of jobs, while also driving innovations that enhance productivity. For example, one interviewee said that their union is working with technology companies to develop AI tools specific to their members’ needs. Yet some labor leaders see a landscape with too few examples of vendors and company leaders who are prepared to allow workforce input into the early-stage problem definition and design phases of generative AI development.

The new partnership between Microsoft and the AFL-CIO mentioned above is a major breakthrough in bringing workers’ voices into the problem definition and design phases of generative AI. Another example is a set of projects hosted by colleagues at Carnegie Mellon and other universities in partnership with UNITE-HERE, the largest US union of hospitality workers. This research team works directly with frontline workers to study how AI tools affect their work and then engages in discussions with employers and vendors on how to use this feedback to modify the designs and uses of AI in this industry.[24]

A number of other unions are also developing strategies to educate members about the potential uses of AI and other technologies and bring their concerns and ideas to bear in policy discussions and collective bargaining. For example, the Communication Workers of America has a national technology committee that advises local union leaders and members on these issues. The American Federation of Teachers is educating its members on using generative AI in their classrooms. In addition, America’s largest union federation, the AFL-CIO, has

created a Technology Institute[25] charged with the goal of advancing worker and union voice across the full spectrum of issues related to new technologies in the workplace.

American unions are also learning from the more direct and early-stage involvement their European counterparts play in technology development and implementation. Compared to their US counterparts, unions in Europe operate under broader policy regulations (some at the European Union level and some at the national level) and have higher unionization rates that support industrywide collective bargaining. Germany and countries in Scandinavia also make widespread use of *works councils*, which are organization-level bodies made up of elective representatives of the organization's workforce.[26] Employers in most of those countries are required to consult with their works councils prior to the introduction of technological changes that affect the workforce. Employers in Scandinavia, for example, have a decades-long tradition of using participatory design principles.[27]

There are three reasons why it is difficult for US unions to replicate these European practices. First, only approximately 10 percent of the American workforce is represented by a union. Second, US labor law does not give workers an automatic right to consultation or negotiation over business decisions to introduce new technologies in the workplace; instead, both the employer and the union have to agree to discuss and/or negotiate over these early-stage decisions. Third, most US collective bargaining is done at the firm or worksite level; there is limited labor-management dialogue at the sector or occupational levels, which might support more collaborative discussion of potential AI uses.

This situation is changing, however. The parties to two recent negotiations (and strikes) between the Alliance of Motion Picture and Television Producers and the Writers Guild of America (WGA) and the Screen Actors Guild-American Federation of Television and Radio Artists (SAG-AFTRA) produced new agreements over how generative AI can be used in their work. The WGA agreement provides that the studios cannot use AI in place of a credited and paid Writers Guild member. Studios can provide writers with an AI-generated draft to work from, but the writers get the credit and receive their normal pay for the final product. Studios can continue to own the copyrights to writers' materials that combine the work of writers with the help of AI. This works well for both writers and the studios, since materials generated solely by AI cannot be copyrighted. The new agreement between the SAG-AFTRA union and the Alliance of Motion Picture and Television Producers also addresses AI: It provides that actors must approve of and be compensated for use of their facial features for creation of their digital replicas.[28]

6. Recommendations

Our primary recommendation, supported by our analysis of the interviews we conducted, is to recognize the need to incorporate the perspectives of workers into the ongoing discourse about generative AI, alongside the perspectives of business leaders, technology developers, and other experts. Our interviews and the broader body of evidence regarding development processes suggest a key conclusion: **The broader the set of**

stakeholders involved in defining the problems and opportunities that generative AI technologies can address, the more likely it is that these tools will be used to augment how workers do their jobs rather than displace them.

Drawing on the insights from our interviews, we identified key decisions and processes needed to bring workforce voice into the development and use of generative AI in four phases. The four phases are portrayed in Figure 1, below: (1) Defining the problems and opportunities to be addressed; (2) Designing the technical and work process features that need to be integrated; (3) Educating and training the workforce in the skills needed; and (4) Ensuring a fair transition and compensation for those whose jobs are affected. We provide recommendations for each of these four phases.

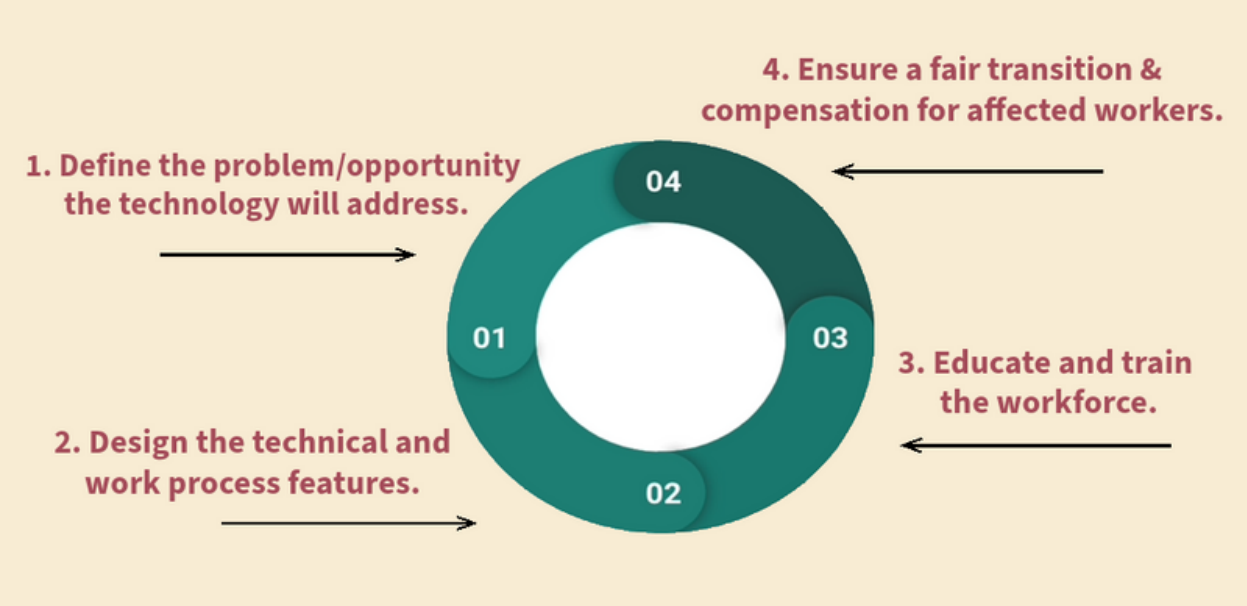

Figure 1
Incorporating worker voice into four phases of technology design and implementation.

6.1. Defining the Problems and Opportunities to be Addressed

Encourage and support industry- and occupational-level collaborative efforts. AI uses will vary significantly across industries and occupations. We see great value in articulating the challenges and opportunities that these technologies offer for work in specific fields. This calls for creating more collaborative discussion forums among government, AI development, academic, business, and labor leaders. The new Microsoft-labor partnership may be a good model for structuring such discussions.

6.2. Designing the Technical and Work Process Features that Need to Be Integrated

Encourage and support workforce experimentation with generative AI. Encouraging workers to experiment and use these tools to explore ways to improve their work processes is a powerful way for workers to participate in the development and use of generative AI.

Expand use of participatory design practices and events. We also see benefits to creating opportunities for multiple sets of stakeholders, including workers, to interact with each other to design and implement AI technologies. One way to make such participatory design a standard and widespread practice would be for organizations and their employees to establish ongoing task forces or technology advisory bodies that review plans for investing in AI systems and tools before they are implemented.

6.3. Educating and Training the Workforce in the Skills Needed

Train workers and students in the use of generative AI. For companies to gain value from bringing the workforce more directly into generative AI decision-making, workers need experience using these tools to improve their work processes and outputs. We are encouraged by the efforts of labor unions to educate their members in the use of AI in their respective industries and occupations. We are also encouraged by the efforts educational leaders are making to educate teachers about how they can use generative AI tools to enhance how they teach and how they can engage their students in appropriate use of these tools. Expanding these efforts will help prepare the next-generation workforce to use generative AI tools on their jobs and to be proactive in shaping the future of work for themselves and their peers.

6.4. Ensuring a Fair Transition and Compensation for Those Whose Jobs Are Affected

Develop fair transition processes that protect workers. Some of our interviewees believe that over time (with significant differences in estimates about whether this will be a slow linear trend, a rapid exponential trend, or even an S-curve that levels off at some point) generative AI may displace a large number of workers; the actual numbers estimated vary widely. Regardless of the size or pace of displacement, actions are needed to ensure fair transition/adjustment processes, policies, and practices. It will also be important to regulate the use of AI in monitoring and overseeing the work of employees.

Employers and labor unions have a long history of negotiating a range of adjustment provisions through collective bargaining, ranging from retraining, to opportunities to bid on new job opportunities, adjustments to compensation systems to ensure workers share in the benefits of new technologies, severance pay and early retirement incentives, and so on.[29] Protections against monitoring of work or personal activities, use of personal data, and use of AI-generated data for disciplinary actions are also getting negotiated into bargaining agreements where needed. These will be cutting-edge issues in collective bargaining negotiations across a wide

array of companies and industries. But adjustment protections tailored to the circumstance of different industry and occupational groups should not be limited to the unionized sector. How to ensure all workers have access to these protections and adjustment practices remains an open question.

Convene multistakeholder discussions and continue development of public policies. Our report has only touched lightly on the role of government policies. This is in part because policymakers are in the very early stages of discussing with different stakeholders what roles government should play in this arena.

A recent executive order issued by the Biden administration charges the US Secretary of Labor with developing recommendations to ensure that workers share in the promise and are protected from the potential perils of generative AI.[30] The Department of Labor is now reviewing the adequacy of existing national policies that might support worker efforts to gain a stronger voice in generative AI and protect them from its potential adverse effects. This is a first step toward a national discussion of what additional public policies are needed to address the challenges and opportunities generative AI poses for the workforce.

Discussions regarding how to regulate and support generative AI development and use are also underway in Congress and in a growing number of states and cities across the country. While achieving legislative changes at the national level is difficult, now is the time to lay the foundation for eventually updating labor law to support worker voice in the early stages of technology development and design. It will also be important to equalize tax policies so that they no longer favor investments in technology over investments in training employees.[31]

7. Implications for MIT

We think MIT is well-positioned to lead the academic community in promoting and supporting worker engagement in generative AI development and use. The place to start is for MIT to model how to bring the voice of the workforce into the full spectrum of AI development and use. One useful step would be to adopt an approach recently taken at the MIT Sloan School to host faculty-wide discussions and mutual learning processes about how to adapt classroom teaching methods to keep up with students' use of generative AI and to support learning with these tools. A similar institute-wide initiative could be mounted that invites both faculty and staff to experiment with generative AI.

MIT has a rich history in studying the future of work. Building on its prior work in this area, MIT could host a series of multistakeholder discussions focused on making sure that generative AI does not result in increased inequality in the economy and society.

MIT also has a long history of working with leaders in both industry and labor and of bringing the voices of workers and worker representatives into the classroom.[32] One way to build on this legacy, consistent with the teaching of participatory design, would be to create a well-traveled pathway for workers, worker representatives, and managers to visit MIT classes to share their perspectives on how generative AI could

augment their work. Moreover, the leaders of the AFL-CIO are committed to building collaborative relationships with universities. MIT and the AFL-CIO could build a partnership that serves our shared interests in bringing workforce voice into generative AI research and teaching.

We see this report as a first step in encouraging ongoing research, teaching, and outreach by MIT faculty and students to help bring the voices of the workforce into generative AI. We hope this report serves as a catalyst for taking up this critical challenge and opportunity.

Footnotes

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