

PREPARING NYC'S ECONOMY AND WORKFORCE FOR THE NEXT WAVE OF AUTOMATION

Last year's presidential election brought a new level of focus to the effects of automation on the economy. Much of the debate centered around the role that automation has played in the decline of the nation's manufacturing sector. But machines are poised to bring about massive changes to a much larger swath of the economy in the years ahead—and not just in the Rust Belt. Robots, artificial intelligence, and other emerging technologies have the potential to displace workers in range of New York City industries, from accountants and x-ray technicians to paralegals and taxi drivers.

Although many of these changes are still years away, our recent policy symposium discussed the steps that policymakers, business executives, and educational leaders in New York should be taking now to prepare for the oncoming wave of automation.

Five important takeaways emerged from the thought-provoking discussion:

1. The effects of automation are being felt by an increasingly wide range of industries and workers, presenting both enormous challenges and new opportunities.
2. The education system needs major reforms to better prepare young people for the new world of work.
3. New York City and the country should strategically rethink skills-building and retraining programs.
4. A new social safety net—including income and work support—will be required to meet the needs of today's automated economy.
5. Companies that are automating have a responsibility to help those who are negatively affected.

The symposium was convened by the Center for an Urban Future and held at the Greene Space at WNYC as part of our ongoing Middle Class Jobs Project, a research initiative funded by Fisher Brothers and Winston C. Fisher.

The following experts participated in the forum:

- **Nell Abernathy**, Vice President of Research and Policy, Roosevelt Institute
- **Lauren Andersen**, Executive Director, NYC Tech Talent Pipeline
- **Rebecca Greenfield**, Workplace Reporter, Bloomberg Business
- **Chris Hughes**, Co-Chair, Economic Security Project; Co-Founder, Facebook
- **Stanley S. Litow**, Vice President of Corporate Citizenship & Corporate Affairs, IBM; President, IBM International Foundation
- **Serkan Piantino**, Founder and CEO, Top 1 Systems, Co-Founder, Facebook AI Research

Automation is affecting an increasingly wide range of industries and workers, presenting both enormous challenges and new opportunities.

Over the past few decades, automation has played a huge role in the decline of manufacturing jobs around the country. In 1980, for instance, it took 25 jobs to generate \$1 million in manufacturing output in the United States, whereas today—because of automation—it takes just five jobs. But a growing body of research suggests that the employment effects of automation are going to be felt in a much broader range of industries, including several that are mainstays of New York City’s economy. According to a study published earlier this year by McKinsey, roughly half of all the activities people are paid to do in the global workforce could potentially be automated simply by adapting current technologies.

Although the effects of automation on New York City’s economy are still emerging, the impact is already being felt across a broad array of the city’s occupations and sectors. “Automation is hitting every single field,” said Rebecca Greenfield, workplace reporter for Bloomberg Business. “There are doctors that use robots for surgery and robots that write news articles. And we don’t often think about robots as software, but software is probably going to be the types of robots that hit New York City jobs the most.”

“We’re talking about not just traditionally middle-class jobs, but jobs like finance, doctors, and lawyers, which can be automated away,” said Nell Abernathy, vice president of research and policy at the Roosevelt Institute.

New York is already seeing this transformation, leading to rapid growth in the number of freelancers, independent contractors, and other gig economy workers—and a spike in people turning to entrepreneurship as a way of supporting themselves. But the panelists agreed that this process is likely to accelerate in the years ahead. “There’s this idea that AI is taking jobs away from the economy,” said Serkan Piantino, the founder and CEO of Top 1 Systems and a cofounder of Facebook AI Research. “Unfortunately, I have to say that it hasn’t even started happening yet. A lot of the stuff in AI is still just in research

land. It’s just on the initial phases of that stuff finding its way into industry and products that people use. So this question is more urgent now than ever.”

There was wide agreement on the panel that automation isn’t necessarily a bad thing. Indeed, each of them argued that automation will bring new opportunities that could greatly benefit New York’s economy—and the city’s workforce. But with these enormous changes coming down the pike, it is also clear that the city should be taking steps now to plan for this oncoming disruption, to prepare New York’s future workforce for a very different economy, and to develop ways to mitigate the negative impacts that are likely to occur because of automation.

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The education system needs major reforms to better prepare young people for the new world of work.

The coming wave of automation will require broad reforms to the educational system. Success in a more automated economy will necessitate a public education system—both in the P-12 school system and in postsecondary institutions—that is much more closely in tune with the skills young people need for today’s new world of work.

One clear takeaway from the discussion is that the current education system is poorly equipped to prepare students for the coming changes. “In my view, it feels like a lot of the education system we have in New York and the United States is broken and ill-adapted to the to the changing nature of the economy,” said Chris Hughes. He noted that the education system is neither “teaching the critical thinking skills that the liberal arts would cultivate, or the vocational skills that would practically get you into a job tomorrow.”

At the same time, Hughes pointed out that many of the tech-oriented skills taught in schools are behind the times. “We are teaching coding languages that are twenty years outdated that people are spending tens of thousands of dollars to get a degree in, only to arrive at the job market and to discover that there is not actually a job for them.”

He was one of several panelists arguing for a more flexible, practical education system that better prepares students to adapt to rapid economic changes. Indeed, several panelists described a core recipe for education that includes identifying what skills will be relevant in the near future, providing an education that prepares students for a lifetime of learning, and creating early opportunities for career exploration.

The current economy benefits individuals with the ability to continue learning on the job. Lauren Andersen, executive director of the NYC Tech Talent Pipeline, noted that not all jobs in the new economy will even require advanced degrees, arguing instead that “critical thinking skills are perhaps the single most important factor.” Andersen contended that New York City should create a foundation where students from every socioeconomic background have the opportunity to gain foundational problem-solving, communication, analytical, and computational skills. “No matter what the jobs are in the future,” she said, “no matter what the evolution, people will need to know how to address uncertainty.” The education system should prepare students “to find the information they need, to pick up the skills they need—this will make them prepared for the evolving future.”

Stan Litow, president of the IBM International Foundation, argued that the coming wave of automation and artificial intelligence presents a critical opportunity to think creatively about education. Just as major economic shifts in previous eras prompted educational changes—like the shift after World War II from a K-8 system toward mandatory high school—Litow said that government officials and private sector leaders should use the potential “crisis” created by automation to shift direction in educational policy. “This is not a new problem,” he said, “but it is a new opportunity.”

For instance, Litow argued that policymakers should rethink the federal work-study program, where

students work at the library or cafeteria for the minimum wage while attending college. He suggests that federal money should instead be used to promote internships where students can have the opportunity to learn real, marketable skills. “We need an incentive to provide opportunities for young people” that can lead to “high skill and high wage jobs in the private, public, and nonprofit sectors,” Litow said.

Litow also called for major changes to career and technical education. “We spend a billion dollars on career and technical education under the Perkins Act and it largely gets distributed across the states on a per capita basis and they can train people for low-wage jobs,” said Litow. “A lot of career and technical education teaches people cosmetology. You could change it and focus it in on labor market data that demonstrates where the important jobs are.”

A few years ago, Litow and his colleagues at IBM launched the pioneering Pathways in Technology Early College High School (P-TECH), a new model for career and technical education where students learn the traditional core subjects of high school while graduating with a no-cost associates degree in an applied science, engineering, or a computer-related field. “When you teach an academic curriculum, you should back end into it the workplace skills that are critically important for a 21st-century career, like problem solving, like writing skills, like collaboration skills, like presentation skills, and make that part of the curriculum,” he said. “At P-TECH, we provide mentors for every student. We provide paid internships for every student. We have an opportunity to use the kind of model of a P-TECH and change how we think of career and technical education across the United States.”

Although IBM started the first P-TECH school, there are hundreds of other companies in healthcare, advanced manufacturing, technology, and finance—among many other industries—that all recognize the need for a talent pipeline. This successful approach presents a clear opportunity for employers to leverage their expertise and insight to help build more successful pipelines into their jobs of the future. According to Litow, companies should see investing in new approaches to public education “as a 21st-century version of an apprenticeship model.”

New York City and the country should strategically rethink skills-building programs.

Automation will displace workers from jobs that exist today. But the opportunity exists to both help younger workers access the promising career paths of tomorrow and assist older workers in retraining for jobs in growing sectors. In order to do this effectively, the city and the country as a whole will need to strategically reassess how skills-building programs are structured, funded, and provided.

It was clear from the discussion that skills building and training programs should be informed by real employer needs, aligned with the labor market, and able to build on existing credentials to help meet the shifting demands of emerging technologies. “We in government need to identify what are the new vanguard of occupations that individuals without these traditional college degrees can move into,” said Andersen. “We at the Tech Talent Pipeline are doing some exciting work to work with our industry partners to identify how you could prepare people for automated roles. What it requires is working very closely with industry partners to identify what are actual skills that are required to move into those roles.”

Achieving these goals will require more flexible funding than the current workforce development system is designed to provide. “The way we achieve this change is by shifting more toward an outcomes framework,” said Andersen. “It’s a shift toward having partnerships and policies that are based on whether this is really working and how we can continue to evolve.”

A new social safety net—including income and work supports—will be required to meet the needs of today’s automated economy.

The coming wave of automation will necessitate a new system of work and income supports—a reimagined social safety net—designed to help more workers adjust to the changes and plug in to different parts of the economy. “How can we adapt the social safety net?” asked Hughes. “Not just to

catch people as they fall through it, but to empower people to adapt to the new jobs of the future.” Panelists agreed that today’s safety net, rooted in the New Deal era, is misaligned with the structural changes in the economy. “The safety net that we have today is still premised on a 20th-century definition of what work is,” said Hughes. “This almost mythological idea of a factory in the Midwest where you work 40 hours with full benefits [is at odds with] the reality of the piecemeal labor we have today.”

Job training programs face serious challenges preparing workers for occupations that are changing rapidly and retraining them multiple times across a career. Programs ranging from tuition assistance to child care could be improved to better meet the needs of nontraditional students and working parents. And the rise of the freelance economy is shifting certain burdens from employers to workers, with uncertain consequences for healthcare and social security.

At the root of these shifts, automation is transforming work itself. “What’s happening today is that the nature of the work across the developed world is fundamentally changing,” argued Hughes. “Work is becoming more piecemeal and precarious and—to the extent that new work is created—it tends to be in part-time positions, consulting roles, or parts of the sharing economy.”

Hughes and other panelists urged policymakers to get behind the idea of portable benefits, which would allow temporary workers and independent contractors to take their benefits with them from gig to gig. Under this model, multiple employers would pay a proportional share of each freelance worker’s benefits, based on the total number of hours worked. These payments would flow into “Individual Security Accounts”—one for each freelance worker in the United States—that would in turn pay into state and federal safety net programs. This approach could help workers in the gig economy acquire and maintain benefit coverage, while ensuring that safety net programs will continue to be funded even as more workers enter the contingent labor force.

Companies that are automating have a responsibility to help those who are negatively affected.

The public sector undoubtedly needs to take the lead in preparing the workforce for the future economy, but employers—particularly those who are benefiting most from automation—also have a responsibility to help address the consequences of economic displacement.

“The leaders of those companies have a moral, political, ethical obligation to engage with these questions . . . and create a future that’s better than the one we have today,” said Hughes.

One opportunity is for businesses to use their clout and resources to invest in 21st-century skills-building initiatives. These programs would benefit workers being displaced due to automation, but it would also help companies that are already struggling to attract highly-skilled talent. “When I think about what the private sector can do,” said Hughes, “I think it’s really push for a more flexible, more practical education system, a system that thinks more about critical thinking so that they can get the talent and succeed.”

Litow emphasized that employers continue to experience skilled-labor shortages, and that training for these jobs can create enormous economic opportunities. “Right now there are about 500,000 vacant IT jobs in the United States,” said Litow. “And we get about 50,000 STEM graduates each year. We have to increase the size of the pipeline, which will require a major investment—and that investment could come from the private sector.”

Bloomfield added that entrepreneurs working in industries likely to be transformed by automation could help by creating profit-sharing opportunities for their employees, incentivizing the hard work now that could lead to a more prosperous—and automated—future. Bloomfield cited the example of ride-sharing company Juno, which reserved 50 percent of its founding shares for drivers. “When their jobs do get automated away,” said Bloomfield, “[the employees will] own part of it.”

The next wave of automation will pose enormous challenges and opportunities to government, nonprofits, and the private sector alike. As occupations begin to automate across all sectors—from manual labor to

white-collar professions—the resulting economic displacement will affect millions of employees, including a large portion of the workforce in New York City. Preparing for the new world of work will require bold leadership from elected officials and significant changes to the current systems of education and training, as well as a reimagining of the social safety net. These transformations are possible, but only through a sustained, collaborative effort that brings all stakeholders to the table.



The Center for an Urban Future (CUF) is a leading New York City-based think tank that generates smart and sustainable public policies to reduce inequality, increase economic mobility, and grow the economy.

CUF has been shaping the local economic policy debate for more than 20 years. Known for generating data-driven solutions to pressing problems, CUF’s ideas serve to increase the city’s prosperity, advance the number of well-paying jobs, and provide low-income New Yorkers with a pathway to the middle class.

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