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NYC'S TECH OPPORTUNITY GAP
Strengthening Pathways and Collaboration
Within High-Tech Workforce Development

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NOVEMBER 6, 2019



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Civic Hall is the nation's leading center for learning and collaboration focused on advancing civic tech and problem-solving for the public good. Civic Hall's mission is to embed civic values wherever technology and society meet, and to help people discover new ways of embodying those values in their work and life. Civic Hall serves as a dynamic and uniquely inclusive hub for ideas, tools, learning, relationships and ventures—both old and new—that can bring about a more just society.

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Cognizant U.S. Foundation is a 501(c)(3) private foundation supporting STEM education and skills training. Launched in 2018 with an initial \$100 million investment from Cognizant, the Foundation has since awarded \$12 million to organizations working to educate and train the next generation of workers in communities throughout the U.S.

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HR&A Advisors has over 40 years of experience advising on complex economic development and real estate projects in cities across the world. HR&A's Urban Tech & Innovation Practice works with governments, technology companies, institutions, advocates, and developers to leverage the technology and innovation economy to increase economic competitiveness, improve quality of life, and broaden economic opportunity in cities. Firm clients include Google, Sidewalk Labs, Airbnb, WeWork, Industry City, CUNY, and the City of New York, as well as innovation districts and research parks across the U.S.

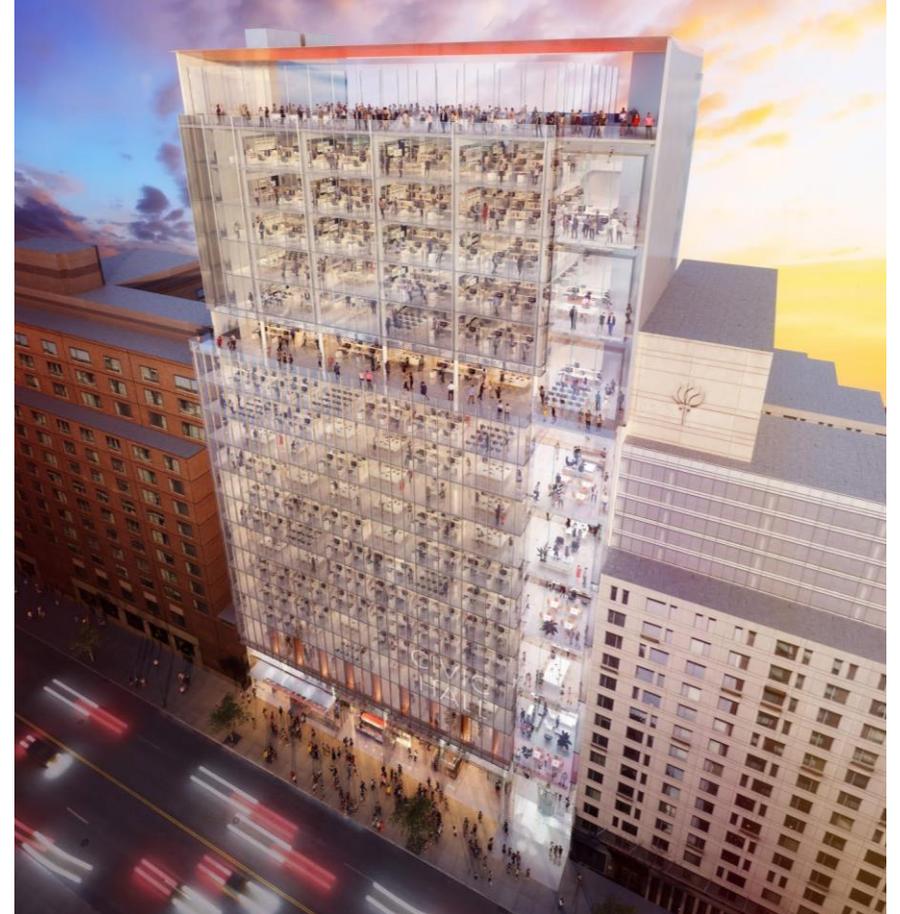
The development of this report was overseen by Sarah Holloway, Senior Planner, Civic Hall @ Union Square; and Rebecca Rosen, Fellow, Civic Hall @ Union Square. *Civic Hall* leadership includes Andrew Rasiej, Founder & CEO; Micah Sifry, Founder & President; and Jessica Quinn, Executive Director. This report was produced by Kate Wittels, Partner, HR&A Advisors; Bret Collazzi, Principal, HR&A Advisors; Renee Barton, Senior Analyst, HR&A Advisors; and Ashley So, Research Analyst, HR&A Advisors.

Introduction

As technological change transforms all facets of modern life and the economy, high-tech skills and the jobs that leverage them are growing in importance. This report was commissioned to better understand the nature and trajectory of jobs that require high-tech skills and how the NYC workforce ecosystem can better prepare New Yorkers to realize the economic opportunity provided by high-tech jobs.

This report's findings will be used to help inform the planning of Civic Hall @ Union Square, a first-of-its-kind center focused on technology for good in New York. The building will include a three-story, 40,000-square-foot Learning Center opening in 2021, a future center of gravity for advancing our City's tech workforce where any citizen can access 21st-century technology education.

The report's findings are based on more than nine months of study that included: 1) a detailed analysis of labor market and economic data, and 2) interviews with more than 90 employers, training providers, City agencies, and community-based organizations who provided critical insights and informed recommendations. A full list of these supporters, to whom we are enormously grateful, is included in the report's appendix.



Executive Summary

The High-Tech Workforce Ecosystem

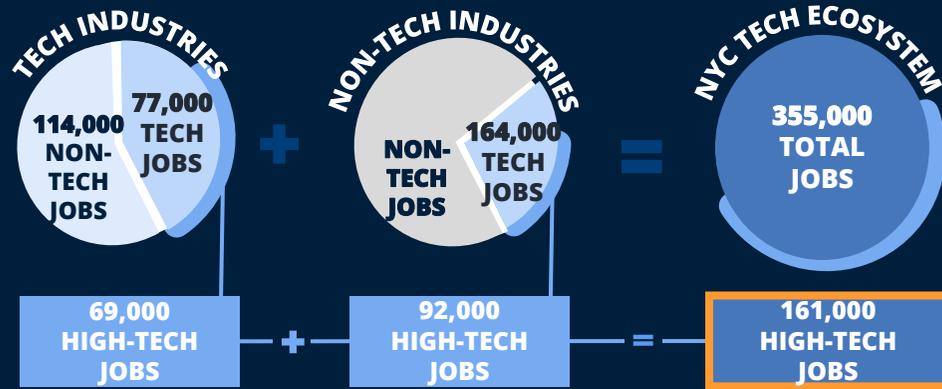
Key Findings: **The Opportunity Gap**

- 1** High-tech jobs are a key driver of growth for both the New York City tech ecosystem and the New York City economy overall, offering well-paying jobs across all industries.
- 2** High-tech skills are growing in importance for all workers at a pace that will be accelerated by technological change and automation.
- 3** Today's high-tech workforce is not representative of New York's diversity, and this under-representation will have major implications as technology reshapes modern life and the economy.
- 4** Critical disconnects in information, data collection, and ecosystem collaboration must be addressed to ensure that all New Yorkers can benefit from high-tech opportunities.

Finding #1

High-tech jobs are a key driver of growth for both the New York City tech ecosystem and the New York City economy overall, offering well-paying jobs across all industries.

THE NEW YORK CITY TECH ECOSYSTEM



HIGH-TECH EMPLOYMENT



High-tech jobs are those focused on the **creation and management of high-tech tools, products, systems, and support services**. Within New York City's tech ecosystem, these jobs are at the forefront of technology and typically concerned with the application of technical and digital skills across a range of industries and activities. They are distinct from other tech jobs that focus on low-tech activities such as the operation of hardware or jobs that may make use of basic digital skills.

High-tech jobs are a key driver of growth for both the New York City tech ecosystem and the New York City economy overall.

- **New York City's 161,000 high-tech jobs make up nearly half of the broader tech ecosystem** and a significant share of jobs across both tech industries and other major New York City industries including financial services, media, professional services, and healthcare.
- **High-tech employment has expanded by 45%** since 2008, **2.5X** faster than the New York City economy overall, and added more than 46,000 jobs.
- **Wages for high-tech jobs are 80% higher than for New York City jobs overall**, with a median hourly wage of \$54.
- **Demand for foundational high-tech skills is growing** across numerous jobs that have not traditionally been considered technical, including the more than 110,000 sales, marketing, administrative, and other "non-tech" jobs in New York City's tech industries.

Finding #2

High-tech skills are growing in importance for all workers at a pace that will be accelerated by technological change and automation.

Training providers and employers reported major recent **shifts in high-tech talent needs.**

Training providers' business models are changing, with a **new focus on up-skilling and re-skilling currently employed New Yorkers.**

This shift may account for up to 50% of their revenue, a shift from a few years ago.

Technological change is driving a need for continuous learning among high-tech talent.

- Fast-paced change – both in software platforms and in macro-fields such as AI and machine learning – requires workers to seek continual training on new technologies.
- High-tech employers in a competitive market also seek candidates versed in specific languages and programs, requiring recent graduates and job-switchers to regularly build on foundational skills.

For all workers, foundational digital skills are increasingly essential.

- Foundational digital literacy increasingly provide a competitive advantage in corporate roles such as finance, operations, and HR, as well as sales and marketing, at both tech and non-tech firms; more than 70% of hard skills that grew in demand over the past two years were digital skills, including specific software systems and social media platforms.

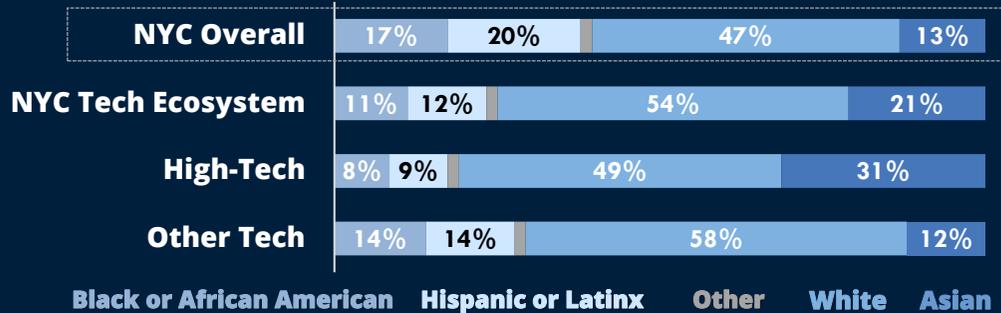
The changing nature of work and automation will continue to displace and redefine skills and roles, increasing the importance of new models for reskilling.

- Past studies have estimated that as many as 1.4 million New York City jobs are somewhat or highly susceptible to automation, comprising over 30% of total employment.¹
- A growing share of employers recognize the need to plan for reskilling and will require a broader range of training to serve this need. Numerous training providers are planning their growth around reskilling, which comprises a significant and growing share of their business.
- Many non-tech jobs that are vulnerable to automation have compatible skills with high-tech jobs and are concentrated in industries with large high-tech workforces. Strategies that retrain displaced workers for entry level high-tech jobs may help ease disruption and diversify talent pools.

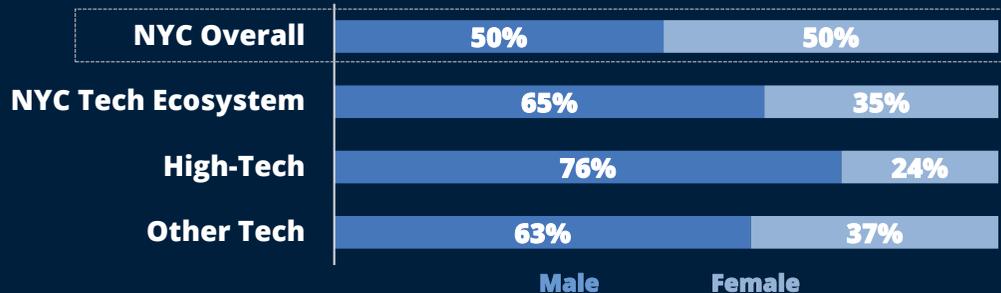
Finding #3

Today's high-tech workforce is not representative of New York's diversity, and this under-representation will have major implications as technology reshapes modern life and the economy.

HIGH-TECH OCCUPATIONS DISTRIBUTION BY RACE/ETHNICITY



HIGH-TECH OCCUPATIONS DISTRIBUTION BY GENDER



Diversity in tech is critical to New York City's economic and civic future. As technology changes how life, the economy, and policy works, the high-tech workforce must reflect the lives it will impact.

- Recent challenges with AI applications and other technologies underscore the wide implications for **potential negative externalities of emerging tech that could reinforce historic and systemic inequalities.**
- The participation of historically marginalized populations in the creation and management of technology is critical** to ensuring that those technologies benefit a diverse population.

However, a lack of diversity and ecosystem coordination persist.

- Women, black, and Latinx workers are underrepresented in high-tech jobs.** Women make up only 24% of New York City's high-tech workforce (vs. 50% of the overall workforce) and Black and Latinx New Yorkers hold only 18% of high-tech jobs (versus 37% overall).
- High-tech jobs have high educational barriers to entry** — 75% of workers hold a bachelor's degree versus 36% across the entire New York City workforce. Labor market data and employer conversations point to an overreliance on bachelor's degrees to screen candidates and judge aptitude.
- Improving coordination among employers, educators, and other training providers is essential to addressing these challenges** and to creating an environment where any New Yorker can succeed in an increasingly high-tech economy.

Finding #4

Critical disconnects in information, data collection, and ecosystem collaboration must be addressed to ensure that all New Yorkers can benefit from high-tech opportunities.

THE HIGH-TECH TRAINING ECOSYSTEM



Data collection and success tracking for training initiatives are inconsistent and not broadly shared, limiting improvement.

- While most training providers report metrics to their funders and government, **there is no common set of metrics or system sharing information.** This limits the collective understanding of who is training for what skills and what strategies work most effectively.
- While many employers are working to diversify recruitment, testing internships and apprenticeships, and providing input to schools and training providers, there is no clear database of these efforts or centralized repository for effective resources or partnership models.

High-tech jobseekers from underrepresented backgrounds frequently lack access to talent and professional networks, limiting access to career information and opportunities.

- The underrepresentation of women and Black and Latinx students at schools where they recruit is a major challenge for high-tech employers' desires to recruit more diverse talent. In addition to broadening target schools, regional talent networks could help employers reach diverse talent.
- Centralized networking can improve career access for candidates not coming out of bachelor's programs who lack networks typically developed in school, while providing exposure to tech cultural norms – how to whiteboard in an interview, what type of work experience is considered valuable, etc. – that are heavily weighted in tech talent recruitment.

Key Opportunities to Enhance NYC's High-Tech Workforce Ecosystem

A diverse high-tech talent pool served by integrated, lifelong learning opportunities is critical to ensuring New York City's workforce is more competitive and equitable.

Standardize tools to support data collection, transparency, and improvements to high-tech training.

- A voluntary database could help to track all high-tech training efforts citywide. The first step to improving New York City's high-tech workforce ecosystem is to understand and aggregate information on the scale, reach, and focus of existing programs today.
- A single collection and reporting platform for outcome metrics could help standardize data collected on training and hiring practices, streamline reporting and reduce costs for resource-constrained providers, improve data quality on long-term outcomes, elevate best practices, and increase awareness of program effectiveness and ROI while remaining sensitive to the needs of individual populations served.
- A virtual system for aggregating tools, resources, and lessons for training providers and employers could improve the quality of training programs and employer hiring/recruitment practices, reduce program development costs, increase collaboration and information sharing among partners, and help take best practices to scale.

Create infrastructure to facilitate continuous learning that meets the demands of rapid technological change.

- Expanded digital literacy training for non-high-tech workers can improve opportunities for advancement and adaptation to changes in technology.
- Exploring targeted reskilling for non-tech workers vulnerable to

automation for high-tech jobs within the same or similar industries could help limit disruption to employers and workers alike. Engaging tech producers in upskilling/reskilling efforts to provide training on their products can help to bridge the gap.

- Increased access to continuous learning can help to maintain a competitive talent pool for highly skilled high-tech jobs, including for recent college graduates and mid-career professionals.

Create more inclusive on-ramps to high-tech careers by focusing on all levels of the career ladder and testing new hiring practices.

- Enhanced physical and virtual networks for high-tech talent from underrepresented groups could improve access to employers and create support structures for career success and advancement.
- Increased training for growing jobs with lower barriers to entry, such as data analysts and network specialists, could broaden access to high-tech careers with greater career mobility.
- Deeper engagement between industries not traditionally thought of as 'tech' and training providers who focus on underrepresented populations could provide more accessible on-ramps to entry level high-tech jobs.
- Further investment in internship and fellowship models that provide extended training and evaluation could broaden access to high-tech jobs for candidates not emerging from bachelor's programs at low risk to employers.

Coming Soon: Civic Hall @ Union Square

Civic Hall @ Union Square will serve as a universal entry point for high-tech job training.



A CENTER OF GRAVITY FOR ADVANCING THE CITY'S TECH WORKFORCE.

Civic Hall @ Union Square will be a **first-of-its-kind center** focused on technology for good in New York. The building will include a three-story, 40,000-square-foot learning center where any citizen can access 21st-century tech education.

Civic Hall @ Union Square will provide a full-stack of offerings that **centralize resources and connections across the ecosystem** to deliver on key opportunities to **develop a more competitive and inclusive workforce**.

- **Learning Hub:** Three floors of classrooms, meeting space, and collaborative workspace that will provide a home base for tech training providers and learners.
- **Community:** An inclusive front door to tech opportunities that building networks among learnings, community organizations, and employers through networking events, workshops, and mentorship.
- **Platform:** An open-source, technology-enabled platform for the New York City tech ecosystem, promoting best practices, sharing industry data, and providing thought leadership on high-tech workforce development.



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