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The Hidden Digital Skills Reshaping New York City's Labor Market

Demand for digital skills is rising in industries beyond the tech sector, including in industries that have long offered accessible entry points into the workforce. But to keep pace with this growing demand, workforce training providers need help.

by Rachel Neches and Eli Dvorkin

- View the accompanying digital skills resource guide here.
- View the recommendations here.

As artificial intelligence reshapes New York's economy, much of the debate has focused on the future of tech jobs. But a new Center for an Urban Future analysis of job postings data points to a broader and longer-running shift: demand for digital skills is rising rapidly in industries and occupations far beyond tech, with significant implications for how city leaders help prepare New Yorkers for middle-wage careers.

In New York City, the share of all job postings asking for in-demand digital skills rose from 34.5 percent in 2015 to 44.2 percent in 2025.[1] Over the same period, the number of postings seeking these skills grew 40.3 percent, more than four times as fast as overall job postings.

This shift is reaching far beyond the tech sector, including many industries that have long offered more accessible entry points into the labor market and where strong digital skills have not typically been viewed as an essential prerequisite. In 2025, nearly half of all job postings in transportation and warehousing (48.6 percent), construction (43.5 percent), and educational services (48.3 percent) asked for in-demand digital skills—up from 33.6 percent, 32.5 percent, and 35.4 percent a decade ago, respectively. Digital skills are now sought in nearly a third of all hospital job postings (31.5 percent) and four-in-ten retail jobs (39.8 percent). In manufacturing, over half of all jobs advertised (51.4 percent) now ask for digital skills, up from 35.2 percent. The numbers are even higher in finance and insurance, where 60.3 percent of job postings ask for in-demand

digital skills (up from 38 percent), and the professional, scientific, and technical services sector, in which digital skills were sought in 61.7 percent of job ads (up from 41.8 percent).

This report, supported by a grant from Verizon, finds that the mix of digital skills that employers are seeking is also changing quickly. Among the top 1,000 unique digital skills—from specific software tools to more general digital capabilities—that were listed in New York City job postings in 2025, 15 percent did not appear just three years earlier, including generative AI, prompt engineering, and ChatGPT. But the changing mix of skills extends well beyond AI. Employers are also asking for workers with experience using data tools such as Power BI, Snowflake, Databricks, and data pipelines; productivity software; and workplace platforms used for customer management, scheduling, records, and other daily tasks.

City leaders will need to ensure that the city's workforce development system has the resources, talent, and tools necessary to keep pace with this rapidly growing demand for digital skills. Our research suggests that workforce training providers need help. Training providers say many participants are entering programs without basic digital skills, even as employers are raising expectations for software, data, and AI-related skills across a growing range of jobs. A health care worker may now need to navigate electronic records, patient management platforms, and scheduling systems. A construction or maintenance worker may be expected to use digital project management tools, logistics systems, or inventory software. A retail or administrative worker may need to use customer management systems, productivity software, and basic data tools that are now part of daily operations.

This means workforce development providers are being asked to help workers build foundational digital literacy while also preparing them for a labor market in which the required technology tools are becoming more advanced and changing more quickly. Training organizations focused on technology careers have been among the early adopters in making this shift, but the growing demand for digital skills means providers across the workforce development field will need support to do the same.

To address these challenges, city leaders will need to strengthen the full continuum of digital skill-building programs and infrastructure, from basic digital literacy to more advanced data, software, and AI-related skills, and help providers themselves upskill to meet these changing needs. As workers increasingly need core digital fluency to qualify for jobs that once had fewer formal skill barriers, ensuring that more New Yorkers can access good jobs being created across the economy will require scaling what works, helping workforce organizations adapt, and making digital skill-building a core part of New York City's economic mobility agenda.

Digital skills are driving hiring demand far beyond the tech sector.

Demand for digital skills is increasing across nearly every corner of New York City's economy, from professional services and finance to health care, education, retail, transportation, manufacturing, construction, and social assistance. In some industries, digital skill requirements are now becoming the norm. In others, especially those that have long offered more accessible entry points into the labor market, the increase suggests that workers increasingly need digital fluency to qualify for jobs that once had fewer formal skill barriers.

- **Digital skill demand increased across nearly every industry and subindustry tracked in the analysis.**Between 2015 and 2025, all but two of the 30 sectors and subsectors tracked saw the share of postings asking for in-demand digital skills increase. Citywide, the share of all job postings seeking in-demand digital skills rose from 34.5 percent to 44.2 percent. The total number of postings asking for these skills grew from 251,475 to 352,806, a 40.3 percent increase.
- **Digital skill requirements are now the norm in several important NYC industries. In 2015, none of the industries tracked in this analysis had a majority of postings asking for in-demand digital skills.**By 2025, more than half of postings asked for these skills in several major industries, including information (72.2 percent),

professional, scientific, and technical services (61.7 percent), finance and insurance (60.3 percent), arts, entertainment, and recreation (53.3 percent), manufacturing (51.4 percent), and real estate and rental and leasing (50.4 percent).

- **Digital skill requirements are also rising in industries that have long offered more accessible entry points into work.** In retail, the share of postings asking for in-demand digital skills rose from 27.9 percent to 39.8 percent; in social assistance, from 30.4 percent to 41.9 percent; in construction, from 32.5 percent to 43.5 percent; and in transportation and warehousing, from 33.6 percent to 48.6 percent. The trend extends to care roles as well: in home health care services, where more than half of workers have at most a high school degree, nearly a quarter of postings now ask for an in-demand digital skill, up from 13.7 percent in 2015 to 23.4 percent in 2025.
- **Several major industries saw especially large increases in digital skill demand.** Among major industries, the largest increases were in information, up 23.2 percentage points; finance and insurance, up 22.4 points; professional, scientific, and technical services, up 20 points; manufacturing, up 16.2 points; arts, entertainment, and recreation, up 15.8 points; and transportation and warehousing, up 15.0 points.
- **In several major industries, the growth in job postings was driven largely by roles asking for digital skills.** Citywide, the number of postings asking for in-demand digital skills grew by more than 101,000 between 2015 and 2025, while postings that did not list these skills declined by nearly 31,600. In transportation and warehousing, postings asking for digital skills accounted for roughly 72 percent of net posting growth; in construction, roughly 75 percent; in retail trade, roughly 60 percent; and in social assistance, roughly 52 percent. In finance and insurance and professional, scientific, and technical services, postings asking for digital skills increased even as postings that did not list these skills declined.

The mix of digital skills employers seek is changing quickly.

As demand for digital skills grows across industries, the skills themselves are also evolving rapidly. Among the top 1,000 digital skills in NYC job postings in 2025, 148 skills, or 14.8 percent, did not appear in postings just three years earlier, and 373 skills, or 37.3 percent, were absent a decade ago. This means workers are not only being asked to bring more digital fluency to the job market; they are also being asked to adapt to a changing mix of tools over relatively short periods of time. For education and training providers, this rapid churn creates a growing challenge around identifying what to train for when specific technologies may change faster than curricula can be updated.

- **AI-related skills are among the fastest-emerging digital requirements.** Generative artificial intelligence, artificial intelligence infrastructure, prompt engineering, and ChatGPT did not appear in NYC job postings in 2022. By 2025, generative artificial intelligence appeared in 9,682 postings, artificial intelligence infrastructure in 1,996 postings, ChatGPT in 1,673 postings, and prompt engineering in 1,308 postings. In total, eight of the top ten in-demand skills are AI-focused, including all of the top seven.
- **The growth in digital skills demand extends well beyond AI.** Employers are also seeking workers with experience using data management and analytics tools that are spreading across industries. Between 2022 and 2025, postings asking for Power BI (a Microsoft data visualization tool) grew from 8,610 to 11,199; Databricks (a data engineering platform) from 1,363 to 3,295; Snowflake (a cloud data platform) from 4,211 to 5,065; and data pipelines (systems for moving and organizing data) from 4,790 to 5,444.
- **Productivity and workplace software are becoming baseline expectations.** Postings asking for productivity software skills more than tripled over three years, rising from 1,551 in 2022 to 5,125 in 2025. This growth suggests that employers are increasingly looking for workers who can use digital tools—including Google Workspace, Teams, Slack, Zoom, and newer AI-powered project management and workflow apps—to organize, coordinate, and manage everyday work.
- **Digital skills are being layered onto human skills, not replacing them.** As demand grows for AI, data, and

software skills, employers are also placing greater value on communication, leadership, and critical thinking. The share of NYC job postings explicitly asking for communication rose from 40.7 percent in 2022 to 45.0 percent in 2025, while postings asking for leadership increased from 17.3 percent to 21.1 percent. Over the longer term, postings asking for critical thinking more than doubled, from 12,542 in 2015 to 26,900 in 2025.

- **Job postings asking for in-demand digital skills offer a significant wage premium.** Across New York City's labor market, job postings asking for in-demand digital skills offer substantially higher advertised wages than those that do not, underscoring how access to digital skills is increasingly tied to economic opportunity. Citywide, full-time job postings asking for at least one digital skill advertised a median salary of $110,000, 25.1 percent higher than the $87,900 median for postings that do not list any digital skills.

Workforce development organizations face heightened challenges.

The rise of hidden digital skill requirements is reshaping who has access to jobs in New York City and creating a growing challenge for the city's education and training ecosystem. As employers ask more of job candidates when it comes to digital skills proficiency, workforce organizations are under increasing pressure to help more New Yorkers qualify for good jobs—including in fields that were not historically considered technology-intensive.

Workforce providers are seeing this shift firsthand. "Employers are demanding digital skills at a higher rate," says Mia Wilson, chief strategy officer of Grace Institute, a tuition-free workforce training program for women in New York City. "But the digital literacy and skills gap has not decreased. People are coming to us with the same level of technological ability, so the gap is getting bigger and bigger." To address this challenge, Grace Institute recently introduced "Tech Launchpad," a pre-program designed to help participants build the baseline digital skills needed to succeed in its training.

It's a steep challenge even for workforce training providers that already focus on helping New Yorkers access tech careers, most of which are used to updating curricula quickly as technology tools evolve and employer expectations change. "When we notice a skill missing in the curriculum, or see changes in the industry, we can adapt our curriculum from cycle to cycle," says Helen Kogan, executive director of the New York and New Jersey metro regions at NPower, a tech training program. "Comparatively, it takes traditional colleges and universities more time, as they often have to get curriculum changes approved by the state."

But it's an even more difficult challenge for the many workforce organizations that prepare New Yorkers for jobs in other fields—including health care, retail, construction, and transportation—that have not traditionally required digital skills. Most of these workforce programs were not designed around digital skills; their instructors may need training themselves, and their curricula, equipment, software access, and employer partnerships may not have kept pace with the technologies now shaping everyday work.

These challenges are unfolding at a moment when employer engagement is becoming more difficult. "We've definitely seen hiring slow down significantly, both in the number of available opportunities and in the number of roles companies are looking to fill each year," says Sarah Wessel, chief partnerships officer at Grace Institute. Hiring uncertainty, driven by economic volatility, tariffs, and the rise of artificial intelligence, is limiting employment opportunities even as demand for digital skills continues to rise, making the role of workforce development organizations both more challenging and more important.

Together, these pressures are raising the stakes for New Yorkers across nearly every part of the labor market. Digital skills are no longer essential only for those pursuing careers in tech; they are increasingly required to access good jobs in health care, construction, manufacturing, transportation, human services, education, and other growing fields, as well as the broader range of opportunities that now depend on navigating digital tools and platforms. Meeting this moment will require city leaders to help workforce organizations across sectors adapt curricula, introduce new technologies, train instructors, strengthen

employer partnerships, and build digital skill development into a much wider range of career pathways.

But New York cannot address this challenge through adult workforce training alone. The city also needs to ensure that every student develops a strong foundation in digital skills and computational thinking, whether or not they ever pursue a career in tech. A Center for an Urban Future analysis of the first ten years of Computer Science for All (CS4All), the city's flagship K–12 computing education initiative, finds that New York City has made real progress: the share of students enrolled in computer science classes nearly quadrupled from 5.5 percent in 2016 to 20 percent in 2024, and the number of computer science classes grew tenfold. But most students still do not take computer science in any given year. In an economy where digital tools are becoming integral to fields from education and health care to construction, manufacturing, transportation, and the arts, these skills are no longer specialized or optional. They are fast becoming part of the baseline preparation every young person needs to access opportunity, adapt on the job, and thrive in a changing labor market.

Recommendations

1. Make a bold new investment in workforce development to build the full continuum of digital skills.

To meet growing demand for digital skills across New York City's labor market, city leaders should make a major new investment in the capacity of education and training organizations to help New Yorkers build skills ranging from basic digital literacy to more advanced data, software, and AI-related skills. This investment could be made through an NYC Talent Development Fund, Career Impact Bonds, an AI Workforce Preparation Fund, or dedicated workforce funding generated through major rezonings—options the Center for an Urban Future has detailed in previous reports. Whatever the vehicle, the goal should be clear: helping workforce providers across sectors adapt to the rapidly changing digital skill requirements now shaping jobs in health care, retail, construction, manufacturing, transportation, social assistance, administrative roles, and other fields.

The city should provide flexible capacity-building grants to workforce organizations to update curricula, train instructors, purchase software licenses, upgrade equipment, and integrate digital skill-building into sector-specific programs. But city leaders should also recognize that not every workforce organization needs to build this capacity in-house. In many cases, the better approach will be to incentivize partnerships between organizations with deep expertise in digital literacy, data, software, and AI-related skills and providers with strong sectoral expertise in fields like health care, construction, manufacturing, transportation, retail, and human services. A health care workforce provider, for instance, should not necessarily have to develop a digital skills curriculum from scratch; it should be able to partner with an organization that already knows how to teach these skills and adapt them to the tools, workflows, and employer expectations in that field. City funding should make these partnerships easier to form, sustain, and scale.

City leaders should also explore a fellowship model that recruits recent CUNY computer science, data, and information systems graduates into workforce development instruction. This would create a new pathway for CUNY graduates in today's slower entry-level tech market while helping nonprofit training providers, libraries, CUNY continuing education programs, and Workforce1 centers build urgently needed instructional capacity.

2. Launch a renewed citywide Digital Equity Plan, with community-based organizations as core implementation partners.

City and state leaders should develop and fund a renewed Digital Equity Plan that charts a clear path forward on broadband adoption, device access, and digital literacy. The plan should set measurable goals, including cutting the number of households without broadband and without a computer in half, expanding public Wi-Fi availability, and growing investment in evidence-based digital literacy and computing education programs. As digital skill requirements spread across nearly every

sector of the economy, the city's digital equity strategy should move beyond broadband and devices alone and explicitly include the skills New Yorkers need to access jobs, education, public benefits, financial services, health care, and other opportunities increasingly mediated through digital tools. This should include core competencies around computational thinking skills, as well as a foundation of applied technology skills that are required in nearly every workplace, such as Google Workspace and Microsoft Office.

Libraries and community-based organizations should be central to this effort. New York City's public libraries are already among the city's most important digital equity institutions, providing free computer access, Wi-Fi, technology help, online learning resources, and trusted neighborhood-based support for residents who may not otherwise have access to digital tools or training. A renewed Digital Equity Plan should give libraries and other trusted community-based organizations dedicated resources to expand digital literacy instruction, support jobseekers navigating online applications and workplace software, and connect residents to more advanced training opportunities through CUNY and workforce development organizations.

3. Prepare for an AI-integrated workforce by launching an AI Workforce Preparation Fund and Citywide AI Workforce Task Force.

As AI-related skills begin appearing in thousands of NYC job postings, the city should launch a Workforce AI Readiness Fund to help education and training organizations prepare New Yorkers for an AI-integrated labor market. Backed by city funding and leveraged with support from major AI firms, employers, impact investors, and philanthropic partners, the fund could support rapid-response curriculum updates in industries and occupations most exposed to AI-driven change while expanding access to AI-related skills training across CUNY, libraries, nonprofit providers, adult education programs, and community-based workforce organizations.

The fund should not be limited to advanced technical training. Many workers will need practical support using AI-enabled tools in administrative, health care, retail, logistics, education, and customer-facing roles. Alongside this fund, the mayor and City Council speaker should convene a Citywide AI Workforce Task Force that brings together employers, workforce providers, CUNY, libraries, labor, philanthropy, and city agencies to identify where AI is changing skill requirements fastest, recommend training priorities, and ensure that city workforce investments are aligned with employer demand and worker protections.

4. Launch a CS4All 2.0 built for the AI era.

Digital skills are becoming embedded in nearly every career pathway, which means New York cannot wait until adulthood to help people build them. If the city wants to prepare New Yorkers for jobs in health care, education, construction, manufacturing, transportation, social assistance, administration, and tech, it has to start by making digital fluency and computational thinking a core part of every student's education.

To build the long-term digital skills pipeline, city leaders should launch a CS4All 2.0: a renewed citywide effort to boost participation in computing education, close persistent gaps, and prepare students for a labor market being reshaped by AI and other technologies. New York City has begun taking important steps to help schools adapt to the AI era, including issuing initial guidance around AI in the classroom. But the bigger challenge is reimagining the city's computing education initiative for a world in which digital fluency is becoming essential across nearly every sector of the economy.

The original CS4All initiative helped expand access to computer science education, but the next phase should be broader than coding alone. A CS4All 2.0 should expand evidence-based, age-appropriate, and engaging instruction in computational thinking, digital literacy, data literacy, and AI literacy across grade levels; fully fund CUNY's Computing Integrated Teacher Education initiative; and create a stackable Computing Across the Curriculum microcredential for aspiring teachers, current educators, and after-school instructors, aligned with New York State's Computer Science and Digital Fluency learning standards. Together, these investments can help make equitable computing education a meaningful part of a sound basic

education and ensure that more young New Yorkers graduate with the digital fluency needed to access good jobs, education, public benefits, civic life, and the full range of opportunities increasingly shaped by technology.

Endnotes

1. Center for an Urban Future analysis of data from Lightcast. In-demand digital skills are defined as the subset of the top 1,000 digital skills (as tabulated by Lightcast) that increased their share of total job postings in New York City between 2015 and 2025.

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