IBM

Technology Workforce Playbook
for the U.S.

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Ever since IBM convened the National Education Summit in 1999, we've made it a priority to expand ways for more Americans to enter the workforce - particularly in the technology industry. With increasing focus on how emerging technologies like AI will transform industries, IBM remains committed to helping Americans get the skills they need to work alongside technology in ways that help their everyday lives.

Despite economic uncertainties, the current unemployment rate remains historically low. The U.S. is experiencing a massive skills shortage across industries and employers are competing for workers with the right mix of skills and competencies for available positions. According to a Manpower report, 77% of employers face difficulties finding qualified talent – a 17 year high.

We see and experience the workforce challenge from two perspectives: as one of the largest, most complex IT infrastructures in the world and as a leading global enterprise technology provider, serving clients across critical sectors as they transition to leverage hybrid cloud and AI technologies. IBM must attract, recruit, develop, and retain diverse talent to support our clients while continuing to be a leader in in emerging technologies including AI and quantum computing.

It is because of this experience that IBM understands the demand and the broad range of skills needed. As such, we had to rethink workforce, education, and professional development to meet today's market needs and create well-paid jobs and more opportunities. To help address the skills gap, IBM is investing in the future of work with a holistic approach that fosters access to education and skilling while creating a more diverse pipeline of applicants. IBM offers a range of education, skills, and career readiness programs to students and job seekers at no cost – all grounded in skills and career tracks relevant to the era of AI.

IBM can't do this alone, and we want to help other companies, institutions, and governments leverage our lessons and experiences to create real pathways to good technology jobs. Here, we offer our playbook for how U.S. businesses and the federal government can better use their resources to jump-start processes to skill Americans for in-demand jobs with rewarding careers and move toward a skill-based economy. Our skills-first approach aims to create a stronger and more diverse pipeline of candidates for technology-related jobs across all industries, reduces systemic barriers, and foster access to learning with trusted and verifiable credentials. We begin with recruitment and hiring, and close with our policy recommendations for Congress and the White House.
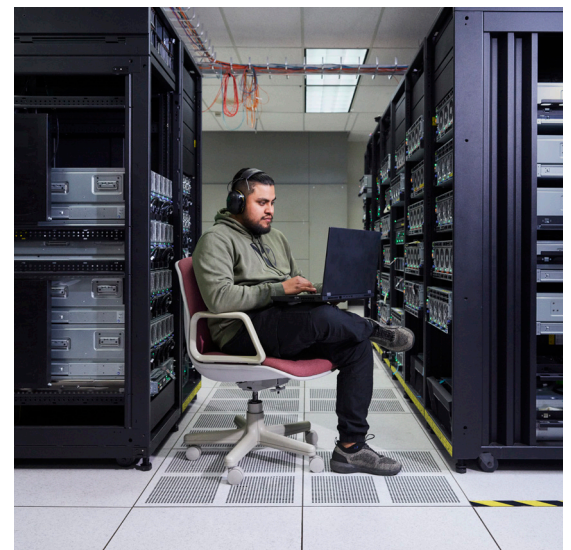
Recruitment, hiring, and retention

The key to winning the battle for talent is having a successful recruitment, hiring, and retention strategy. For IBM, this includes continually reviewing the skills needed as a company and looking at the broader talent pool. IBM takes a skills-first approach to hiring by first looking at people's skills and ability to learn rather than if they have a four-year degree and where they earned it. This expands opportunities for well-paid and rewarding jobs to more people and helps create a more diverse workforce.

We also recognize that more needs to be done – and at scale – to ensure our country can remain competitive globally. As such, we have built a skills-first path strategically and sustainably. We believe government and private sector employers can use our lessons and adopt these proven ways to improve recruitment and hiring in technology jobs to ensure more Americans, regardless of background, can pursue a rewarding career.

Recruitment, hiring, and retention

1. Rewrite job descriptions. It's critical to write inclusive, skills-based job postings to broaden candidate talent pools. This has been proven to increase diversity and improve applicant quality.

Rewriting job descriptions and removing the 4-year degree requirement in more than half of our U.S. job openings resulted in more diverse applicants – including a 63% increase in underrepresented applicants – and almost 20% of our U.S. hires joining without a degree.

A common refrain is, "can this talent compete?" Our experience and cognitive ability assessments during the U.S. interview process show no meaningful difference in the scores between those with and without bachelor's degrees. Furthermore, U.S. hires without traditional college degrees are more likely to score top ratings in the "Business Results and Skills" section of IBM's annual performance assessments, when compared to their peers with four-year degrees.

2. Create new career pathways. We believe employers, governments, and education providers collectively need to challenge the assumption that the beginning of a career is always on a college campus. College degrees are one pathway among many to a rewarding career. Employers should ensure more pathways lead to high value careers and not merely entry-level jobs. Employers can do this by focusing on their employees' possible career pathways, not just the immediate job in question.

IBM's U.S. Apprenticeship program provides an entry point into IBM for people with relevant skills but without advanced degrees— what we call "new collar" talent. Our U.S. Department of Labor-registered program is competency-based and enables apprentices to be paid while they learn skills for various strategic roles. Launched in 2017, the program began with software engineering and has expanded to 35 job roles, including data science, cybersecurity, and design. And in 2022, IBM committed to investing $250 million in apprenticeship and new collar programs by 2025.

Today, we have hired approximately 1,000 apprentices through our U.S. program with more than 90% of past program graduates becoming full-time IBMers. Registered apprenticeship programs are a valuable and viable pathway to well-paid jobs in technology with benefits for both employers and workers and help increase equity for underrepresented populations. For instance, in 2022, IBM's Cybersecurity Analyst and Mainframe System Administrator apprenticeships were recognized by the American Council on Education (ACE®) to earn job seekers up to 48 college credits.

Through our IBM Z Mainframe Employer Apprenticeship Program, IBM is working with over 30 Fortune 100 companies – and mainframe clients – to recruit and prepare ZSystem mainframe administrators for our clients to hire in registered apprenticeship roles. To date, our mainframe clients – banks, large retailers, automakers – have hired close to 200 apprentices across the country. The validity of this program is demonstrated by the fact that our clients are coming back to us for additional talent.

3. Support continuous learning. To retain our employees, IBMer life-long learning and development have been a hallmark of IBM's culture since graduating its first class of sales professionals in 1916. Today, we continue to invest in learning and development programs. Our employees are expected to complete a minimum of 40 hours of professional development annually to continuously build their skills and remain competitive in today's marketplace. Our employees exceed that mark: In 2022, IBMers completed over 80 hours of learning on average. As a result, 9 out of 10 IBMers now have skills of the future, compared to 3 out of 10 when we started this initiative more than 5 years ago.

IBM's employee learning uses AI to create personalized recommendations and track progress. Still, each employee can decide whether to follow the recommendations or pursue a different course. Additionally, our digital credentials are recognized by industry, which helps create career pathways within IBM and fill skills gaps across the labor market.

Credentials, including digital badges, that provide a measure of learning progress and skills acquisition are a vital part of IBM's robust education and professional development strategy. These credentials provide employees a portable means of carrying their learning achievements along their career journeys.

Building and supporting a diverse workforce

In 2021, at the White House Cybersecurity Summit, IBM CEO Arvind Krishna announced a commitment to help skill 150,000 people in cybersecurity by 2024. To help achieve this goal, and to contribute to a more diverse U.S. cyber workforce, we partnered with 20 Historically Black Colleges and Universities to co-establish Cybersecurity Leadership Centers. Through these partnerships and programs like IBM SkillsBuild, IBM has already provided more than 119,500 learners with cybersecurity training.

IBM SkillsBuild is a free education program focused on underrepresented communities in technology that helps adult learners and secondary and university students develop valuable new skills, obtain digital credentials, and access career opportunities by making them job ready. The program includes an online platform that is complemented by customized practical learning experiences delivered in collaboration with a global network of partners.

The open version of IBM SkillsBuild offers over 1,000 courses in 20 languages on technical disciplines including cybersecurity, data analysis, and cloud computing. Once completed, participants earn IBM-branded digital credentials that are recognized by the market. This helps companies increase their talent pool, provides people with a route into employment and helps address technology skills shortages.

For example, not-for-profit organizations such as Mom Relaunch, which helps mothers achieve financial independence, partner with IBM to successfully create diverse workplaces. Using IBM SkillsBuild, Mom Relaunch gives mothers enhanced access to skilling in AI, cybersecurity, data analysis, cloud computing, and other technical disciplines — as well as in durable workplace skills such as project management, presentation, and design thinking.

And as AI innovation further accelerates, the need for durable, professional skillsets will be even more crucial. The IBM SkillsBuild "Artificial Intelligence Fundamentals" learning plan is 6 courses that covers AI's history, ethics, and how AI makes predictions, understands language, and images. We also offer a hands-on simulation in which learners build and test a machine learning model and provide tips on how to find a career in artificial intelligence.

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Further, IBM's partnerships with Historically Black Colleges and Universities (HBCUs) offer an industry best practice by using highly skilled IBM experts to co-develop curricula, immersive learning experiences, and professional development support. HBCU faculty can consult with IBM technical personnel, and students and faculty can benefit from access to IBM technology products, forums to exchange best practices, IBM experts, and discovering IBM internships and job openings.

Last year we co-created Cybersecurity Leadership Centers with 20 HBCUs across 11 states which will give students and faculty access to IBM programs and certifications at no cost. For each participating HBCU, IBM provides customized learning including courses to help the university enhance its cybersecurity education portfolio. Faculty and students also have an opportunity to use IBM Security's Command Center, which offers realistic, simulated cyberattacks to prepare them on response techniques.

IBM has also found that military veterans bring unique talents, mindsets, and skills that are especially valuable to technology positions. It's about having the right practical experience, enthusiasm, commitment to learning, and the determination to succeed, regardless of having a traditional bachelor's degree. As such, IBM developed programs to focus on education and certification programs for military veterans and enable an easier transition into the cybersecurity workforce.

In 2022, IBM announced a partnership with the U.S. Department of Veterans Affairs to offer enhanced IBM SkillsBuild programs for veterans and transitioning service members seeking new job skills to pursue high demand technology careers. IBM will also provide mentors to veterans to support them throughout their job application process.

Lastly, we recommend that employers develop supporting services for new hires, including with their managers and mentors. We found that managers often need a mindset change to reset their expectations from years of "buying talent" instead of building it. This is especially important when considering the diversity of backgrounds and experiences of new collar talent. IBM leveraged mentoring and coaching certifications to ensure a required depth of skill with key individuals. We also created dedicated manager learning programs for selection and skills-based pay, along with tools like a Slack channel and support centers.
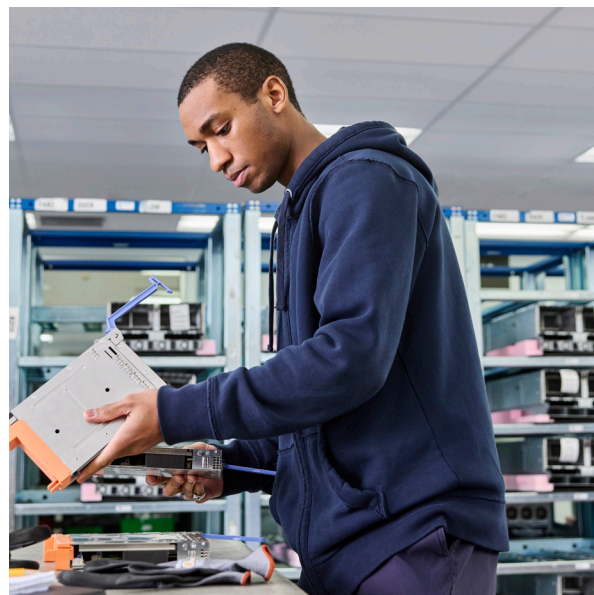
Policy Recommendations

To truly address the technology skills gap and maintain our competitive advantage as a nation, we need to scale these best practices exponentially. We have seen progress over the years by different administrations to move towards skills-first hiring and make it easier for employers to scale skilling programs. But more needs to be done.

Fortunately, there are several bills moving through both the House of Representatives and Senate which could better align our disparate education and workforce systems. And collectively, these pieces of legislation represent an urgent and viable opportunity for policymakers to seize this year.

IBM calls on the administration and Congress to advance skills-based hiring, reform education and workforce development policies, elevate on-the-job learning programs, and bolster productive partnerships with employers. Specifically, we recommend they:

– **Expand skills-based hiring in the federal government, including for federal contractors.** The Biden Administration supports and continues to implement the previous administration's Executive Order 13932, Modernizing and Reforming the Assessment and Hiring of Federal Job Candidates, and subsequently issued additional guidance through the U.S. Office of Personnel Management (OPM). The order directs OPM to reduce degree-based job classification and qualification standards in the federal civil service.

   While the federal civil service is moving in the right direction with skills-based hiring, it is important to note that currently federal contractors, including IBM, are rarely able to place an individual without a four-year degree on a technology services contract, regardless of their qualifications. Federal agencies tend to require educational degrees despite the reality that many roles can be staffed by individuals without degrees. IBM encourages the administration to take the next steps and reduce barriers to skills-based hiring in federal contracting, encourage contractors to use skills-based hiring, and develop a framework that makes this feasible for the long term.

– **Explore on-the-job learning and employer skilling programs within the government.** Work-based learning opportunities -- including earn-while-you-learn programs, apprenticeships, and internships -- help job seekers and workers. Congress and the administration must continue identifying ways to incentivize employers who start and expand skilling programs by streamlining administrative processes and offering direct funding.

   IBM recommends agencies such as the Office of the National Cyber Director explore opportunities to pilot federal apprenticeship programs in cybersecurity that include a career progression within the federal government. We also recommend increased funding for DOL apprenticeships to provide more partnerships with community colleges.

– **Strategically align higher education and workforce development laws to focus on skills.** As the need for skills-based learning is on the rise, and higher education is not keeping pace, it is critical for federal laws to align to provide the necessary resources learning. We urge Congress to update the Higher Education Act and the Workforce Innovation and Opportunity Act (WIOA) and innovate across federal statutes to eliminate programmatic silos and help more Americans attain the skills needed for well-paid jobs.

Policy Recommendations

More specifically, we recommend Congress:

○ **Pass short-term Pell.** Allow part-time students and mid-career professionals to get Pell Grants for job-aligned skilling, reskilling, and upskilling programs such as apprenticeships and community college classes.

The Jumpstart Our Businesses by Supporting Students (JOBS) Act has been reintroduced in the House of Representatives and Senate with bipartisan support and would allow low-income part-time students and mid-career professionals to access federal funds. This would include quality online learning courses and other non-degree seeking programs that are shorter than 15 weeks and help individuals attain the in-demand skills employers need. Additionally, the House workforce and education leaders – including committee Chairwoman Virginia Foxx and Ranking Member Bobby Scott – have introduced bills which would expand federal Pell Grants for high-quality, short-term skills and job skilling programs.

○ **Remove restrictions on federal work study.** Remove restrictions for students on federal work-study funds for off-campus work experiences which can help them build real career skills.

○ **Invest in community colleges.** Community colleges have consistently proven through their flexibility, reach, and partnership that they are catalysts for inclusive approaches to skills and education. We encourage further investment to make community college available to a broader population of students.

○ **Dedicate Individual Accounts (ITAs) for workforce development.** We know that work-based learning works. IBM advises Congress to remove barriers limiting skills attainment within WIOA, including dedicating funding towards Individual Training Accounts, increasing dollar limits on incumbent worker programs, and enhancing work-based learning programs. We encourage Congress to invest in work-based learning opportunities, including earn-while-you-learn programs, apprenticeships, and internships initiatives.

○ **Reform the Eligible Training Provider List (ETPL).** More effectively and directly connect the ETPL to the needs of employers with in-demand and growing jobs, ensure flexibility by allowing online and hybrid workforce development programs, and focus on quality and outcome measures. Also, Congress should ensure employers on the ETPL can provide upskilling and reskilling, especially for pre-apprenticeship, apprenticeships, and other on-the-job opportunities.

○ **Increase transparency and reviews of outcomes.** Currently, jobseekers do not have access to complete information to help guide their decision to pursue skills development programs. A vital part of this is the availability of the quality and transparency of outcomes data on critical program measures such as completion and employment rates, credential attainment, and earnings. As such, improved access to quality data will lead to more transparency and help move the system toward high-quality, affordable skilling opportunities aligned with the needs of regional, state, and local employers.

Policy Recommendations

– **Update the National Apprenticeship Act.** The time is now to modernize the 1937 Apprenticeship law and make it easier for employers to start and expand apprenticeship opportunities, particularly for non-traditional and high-growth sectors such as technology. To grow and expand this proven earn-and-learn model, we must include reciprocity for nationwide employers, streamline and simplify processes, expedite new occupational frameworks, increase flexibility, and elevate intermediaries.

   o **Increase flexibility.** Wherever possible, Congress should infuse the national apprenticeship system with as much flexibility as possible without compromising quality. For example, Congress should give precedence to competency-based programs particularly in nontraditional, in-demand and growing occupations like technology.

   o **Align apprenticeships with other education and workforce laws.** Congress should ensure that WIOA, the Higher Education Act, Perkins CTE, and veterans skilling programs that support work-based learning are aligned and include incumbent workers. Congress should also consider making available the various funding sources that support apprenticeships and work-based learning and allow those funds to be combined for maximum impact and accessibility by employers.

   o **Support the validation of on-the-job learning into equivalent college credit.** We encourage the creation of pathways to new careers by allowing learners to easily transition between work and education and transferring apprenticeships into college credits. For instance, eligible entities should be able to use apprenticeship grant funding to transfer their program credits into college credit through the articulation of prior learning credit. We also support articulation agreements between apprenticeship sponsors and post-secondary institutions, including the review of corporate learning programs and exams, apprenticeships, certifications, and other non-traditional education experiences for credit recommendations that can be articulated to Institutions of Higher Education.

   o **Advance pre-apprenticeships.** Congress should extend funding for pre-apprenticeship programs that can carry students through longer learning journeys. A pre-apprenticeship programs provides non-traditional workers an opportunity to gain fundamental knowledge, skills, and abilities to be successful in a high-skilled apprenticeship programs.

   o **Elevate intermediaries.** Intermediaries often partner with companies to create end-to-end solutions that provide an on-ramp to able, committed individuals without degrees or prior experiences. Intermediaries can also offer coaching to the apprentices and employers throughout the process, limiting the administrative burden on employers. At IBM, we partnered with Franklin Apprenticeship to make the IBM Z Mainframe Apprenticeship program available to Fortune 500 companies. This program has broadened and diversified apprentice talent in the technology industry. We encourage Congress to increase support for intermediaries to scale apprenticeships nationally.