INDUSTRY PROFILE

Information Technology

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Information technology (IT) and other tech jobs have become ubiquitous in the workplace, with 45 percent of tech workers employed in the IT sector and 55 percent employed in tech roles throughout other sectors (CompTIA 2024). Although the IT sector has experienced layoffs since 2022,[1] the demand for tech talent remains fairly steady as of August 2024 (CompTIA November 2024), and tech employment is projected to grow twice as quickly as overall employment over the next 10 years (CompTIA 2024).

The IT sector's occupational landscape has evolved rapidly over the past two decades, showcasing the industry's adaptability to changing needs and technologies. The increased use of artificial intelligence (AI) is poised to disrupt the IT sector, such as changing the skills needed for many tech occupations.[2] To keep up with the pace of innovation and digital transformation in our economy, industry leaders report a need for tech professionals with diverse technical and soft skills.

Apprenticeship is a proven industry-driven training solution that provides a flexible model that can be customized to meet the specific needs of each company. This industry profile highlights key trends in the tech workforce and provides resources for those interested in developing Registered Apprenticeship Programs for tech occupations.

Workforce Opportunities and Challenges

The IT sector plays an important role in the US economy, accounting for over 12 million jobs and contributing over 10 percent to the nation's GDP.[3] Employment in tech occupations is projected to grow twice as quickly as overall employment over the next 10 years, a promising sign for the industry's future (CompTIA 2024). Among tech occupations, data and cybersecurity-related roles have some of the highest growth rates, while software development and IT support occupations contribute the most to industry employment gains.

Employment in the IT sector is recalibrating as companies adjust to shifts in the postpandemic investment and financing landscape. In 2023, more than 260,000 individuals in the IT sector lost their jobs.[4] Despite these layoffs, employment in tech jobs remains fairly steady as of August 2024 (CompTIA November 2024), with many companies struggling to fill high-skilled roles.[5] In addition, the pace of computer science degree holders is at an all-time high, with 108,503 gaining bachelor's degrees in the 2021–22 academic year.[6]

As rapid innovation changes the nature of tech work, the IT sector faces a significant skills gap—a mismatch between the skills employers need and those that employees and applicants possess (CompTIA 2017). Nearly 90 percent of industry tech leaders indicated that recruiting and retaining talent were major or moderate challenges.[7] Advanced technologies, including automation and AI, are expected to transform the IT industry; while demand for some tech jobs will shrink, many jobs will change and require different skills to augment the capabilities of AI.[8] Industry leaders are diversifying talent pools and focusing on the professional development of internal candidates through courses and certifications.[9] Internal talent mobility programs allow organizations to be more agile in response to rapidly changing tech skill needs and attract and retain employees interested in long-term career growth (CompTIA 2023).

Lack of diversity is a pressing challenge for the IT sector. Only about 27 percent of tech workers are women, 8 percent are Black, and 8 percent are Hispanic (CompTIA 2024). Although many IT organizations have focused on

diversifying their talent pipelines through recruitment initiatives and education partnerships, developing inclusive cultures is another area for improvement. IT organizations with inclusive cultures have been shown to achieve better business outcomes and be more innovative and agile.[10]

Labor Market Trends in Information Technology from 2013 to 2023

Employment:
Projected employment growth of **3.4%** from 2023 to 2024

Wages:
Median wage of **$104,556** in 2022

Job Openings:
Approximately **6 million** job postings in 2023

Source: "State of the Tech Workforce," (Downers Grove, IL: The Computing Technology Industry Association [CompTIA]), accessed August 7, 2024, https://comptiacdn.azureedge.net/webcontent/docs/default-source/research-reports/comptia-state-of-the-tech-workforce-2024.pdf?sfvrsn=a8aa5246_2.

Information Technology Employment Outlook from 2022 to 2032

Employment growth is projected for many occupations, such as the following:

- Information security analysts: +33.5%
- Software developers: +29%
- Web and digital interface designers: +23.4%
- Computer systems analysts: +17.8%
- Database administrators: +17.8%
- Computer network architects: 12.1%

Source: "Employment Projections, National Employment Matrix, NAICS 518000 Computing Infrastructure Providers, Data Processing, Web Hosting, and Related Services," (Washington, DC: US Bureau of Labor Statistics), accessed June 6, 2024, https://data.bls.gov/projections/nationalMatrix?queryParams=518000&ioType=i.

Apprenticeship in Information Technology

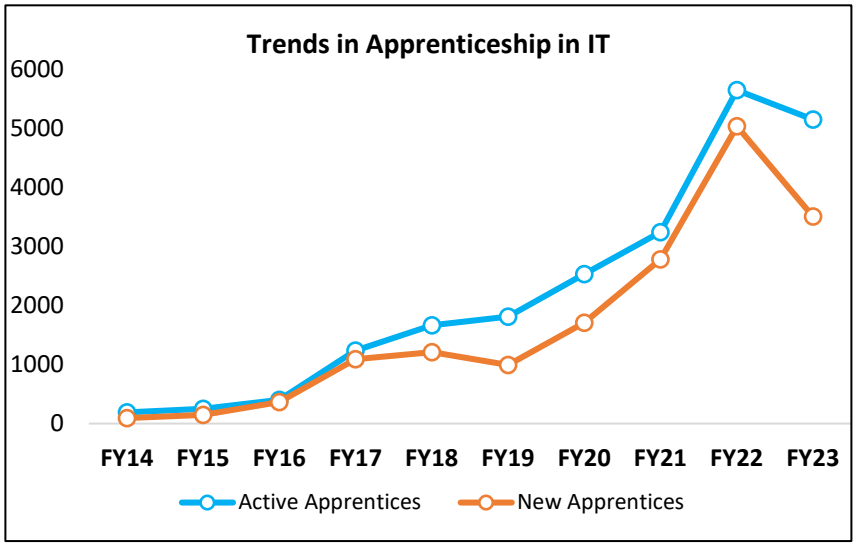
Apprenticeship offers a proven solution for recruiting, training, and retaining a highly skilled workforce in the IT sector. Registered Apprenticeship Programs are an industry-driven training model that provides a critical talent pipeline for the IT sector and can be customized to meet each company's specific needs.

Registered Apprenticeship Programs enable companies to train flexible and adaptable tech workers who can keep pace with rapid technological innovations and their application in the workplace. Apprenticeships also support employee retention and workforce diversity, which are key challenges in the IT sector.[11]

Since 2014, the number of Registered Apprenticeship Programs in tech occupations has grown by 14 percent, reflecting the value tech employers find in this talent development model.[12] The number of active tech apprentices has grown by 2,611 percent since 2014, while the number of new apprentices has increased by 3,672 percent.[13]

Spotlight: ACI Learning

ACI Learning provides training to audit, cybersecurity, and IT professionals through a learning management system and a Tech Academy training program for career changers and other individuals interested in a tech career. Many Tech Academy participants had no IT industry work experience, making it more difficult to secure employment in the competitive tech job market after program completion. In response, ACI Learning developed a Computer User Support Specialist apprenticeship program that provides structured on-the-job learning and technical skills instruction (https://www.acitechacademy.com/apprenticeship-application). Apprentices learn fundamentals of IT service delivery in a business environment and critical skills in cybersecurity, networking, and IT support, and work full-time with support from a mentor. ACI Learning has found that employers are responding positively to the work-and-learn structure of the apprenticeship program and are applying it to develop tech talent internally.



Source: "Data and Statistics: Interactive Apprenticeship Data," (Washington, DC: US Department of Labor), accessed June 24, 2024, https://www.apprenticeship.gov/data-and-statistics/apprentices-by-state-dashboard.

Common Tech Apprenticeship Occupations in 2024

Software (application) developer — 1,112 apprentices

Cyber security support technician—816 apprentices

Computer programmer —646 apprentices

Computer support specialist—526 apprentices

IT generalist—327 apprentices

National Occupational Frameworks

National Occupational Frameworks provide the building blocks of a Registered Apprenticeship Program for a specific occupation, including the on-the-job training and instructional coursework that apprentices will complete. Organizations can use the frameworks to accelerate the design and registration of apprenticeship programs because they are thoroughly researched and reviewed by industry experts in business, labor, workforce, and education, and are approved by the US Department of Labor.

National Occupational Frameworks are available for several tech occupations. See the links below to access each framework:

- Application developer: https://urbn.is/4fa6XrP
- Computer network architect: forthcoming
- Computer systems analyst: forthcoming
- Data analyst: forthcoming
- Database architect: forthcoming

- Database technician/administrator: https://urbn.is/3ZnK920
- DevOps engineer: forthcoming
- Digital accessibility technician: https://urbn.is/4535xfe
- Information security analyst: forthcoming
- IT generalist: https://urbn.is/4iz8IBZ
- Junior cloud engineer: https://urbn.is/42yxFFW
- Network and computer systems administrator: forthcoming
- Penetration tester: https://urbn.is/45Fp1XE
- Software quality assurance analyst and tester: https://urbn.is/3uTNVVL
- User experience designer: https://urbn.is/3VWrUzZ
- Web and digital interface designer: forthcoming

Additional Resources

For more information on apprenticeship in the tech sector, please visit

- the National Occupational Frameworks in information technology (http://apprenticeships.urban.org/explore-industries/information-technology), and
- Apprenticeship USA's resources on apprenticeships in information technology (https://www.apprenticeship.gov/apprenticeship-industries/information-technology).

Notes

[1] Florian Zandt, "How Many Tech Workers Were Laid Off Since January 2022?" Statista, February 16, 2024, https://www.statista.com/chart/29421/number-of-workers-laid-off-worldwide-in-the-tech-startup-sector-since-jan-2022/.

[2] "What will the enterprise of the future look like?" Alteryx, https://www.alteryx.com/resources/whitepaper/what-will-the-enterprise-of-the-future-look-like, accessed December 10, 2024.

[3] "Software and Information Technology Industry," International Trade Administration, https://www.trade.gov/selectusa-software-and-information-technology-industry, accessed December 10, 2024.

[4] Bobby Allyn, "Nearly 25,000 tech workers were laid off in the first weeks of 2024. Why is that?" NPR, January 28, 2024, https://www.npr.org/2024/01/28/1227326215/nearly-25-000-tech-workers-laid-off-in-the-first-weeks-of-2024-whats-going-on.

[5] David Jarvis, "Tech talent is still hard to find, despite layoffs in the sector," *Deloitte Insights*, August 13, 2023, https://www2.deloitte.com/us/en/insights/industry/technology/tech-talent-gap-and-skills-shortage-make-recruitment-difficult.html.

[6] "Digest of Education Statistics: Table 325.35," National Center for Education Statistics, https://nces.ed.gov/programs/digest/d23/tables/dt23-325.35.asp, accessed on December 17, 2024.

[7] David Jarvis, "Tech talent is still hard to find, despite layoffs in the sector."

[8] "What will the enterprise of the future look like?" Alteryx.

[9] Bobby Allyn, "Nearly 25,000 tech workers were laid off in the first weeks of 2024. Why is that?"

[10] Anjall Shalkh, Kristi Lamar, and Caroline Brown, "Repairing the pipeline: Perspectives on diversity and inclusion in IT," Deloitte Insights, October 15, 2018, https://www2.deloitte.com/us/en/insights/focus/cio-insider-business-insights/perspectives-on-gender-diversity-and-inclusion.html

[11] "How Apprenticeships Can Help Diversify the Tech Workforce?" Evidence in Action (podcast), Urban Institute, November 18, 2021, https://podcasts.apple.com/us/podcast/how-apprenticeships-can-help-diversify-the-tech-workforce/id1323147711?i=1000542329316; Elliot, Marotta, Hernandez-Lepe, and Rayfield (2022).

[12] Data on the number of Registered Apprenticeship Programs are from the Apprenticeship Data Alignment & Performance Technical Assistance Center at The Council of State Governments (https://web.csg.org/adap-tac/).

[13] To calculate apprenticeship statistics for the IT sector, we filtered the apprenticeship.gov dashboard by occupation. To view a full list of the occupations we included in the IT sector, see our "Apprenticeship Dashboard Occupations: IT" list at https://airtable.com/appFPebcNM8POjpcF/shrQo4ZEJVZuGA78G/tblXytMIOsiQGH2rb.

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Elliot, Diana, John Marotta, Fernando Hernandez-Lepe, Jacqueline Rayfield. 2022. "What Works in Tech Apprenticeship." Washington, DC: Urban Institute.

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