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Industry Workforce Trends

Research Brief

Talent, skill and training review across industry sectors

January 2025 release

Key Points

78% Percent of C-suite executives expecting a high degree of change in skill requirements (vs. 58% across all staff levels)

55% Percent of companies reporting hiring staff in the past 12 months with new skill sets to meet changing business needs (slightly higher rate among the professional services sector and tech sector)

71% Percent of companies indicating they plan to increase spending for training and professional development in the year ahead. An additional 23% indicate no change in spending levels and only 6% plan to cut back on spending (sectors with the highest rates of increase include tech, manufacturing and finance)

#1 Cybersecurity rates as the #1 priority across sectors in developing a depth and/or breadth of skill among staff; the next highest priorities in rank order include project management, artificial intelligence, and data/analytics

75% Percent of companies placing more importance on upskilling/ reskilling strategies (slightly higher among companies in the tech, manufacturing and finance sectors)

81% Percent of companies reporting industry-recognized certifications factor into the hiring process (slightly higher among companies in the manufacturing, tech and finance sectors)

44% Percent of companies reporting a challenge with training entails connecting training to business outcomes; an additional 32% cites quantifying training ROI over time a challenge
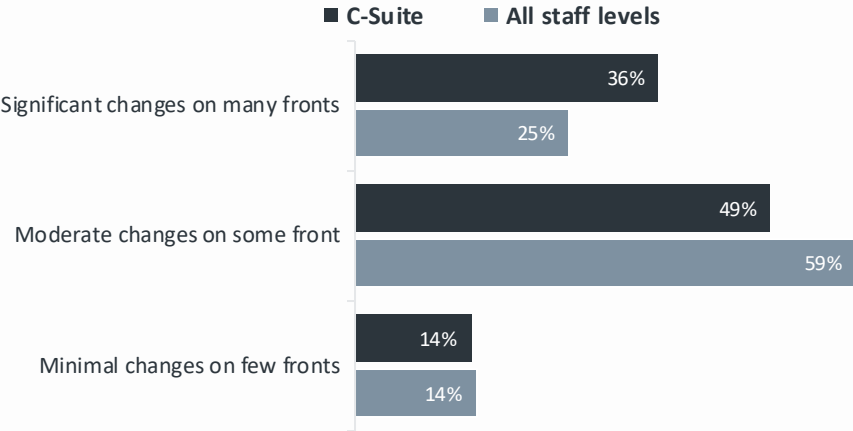
See Methodology for survey and sample details

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Companies across sectors strive to leverage technology – and by extension, digital transformation, more effectively

Top reported challenges in adopting and leveraging technology

1 Challenges in technology getting ahead of processes and workflows [48%]

2 Challenges in technology getting ahead of people, skills, capacity to use, etc. [47%]

3 Challenges integrating new technologies with existing systems, applications, data etc. [40%]

6 in 10 concerned outdated technology increases the risk of staff frustration; with implications for retaining or recruiting talent
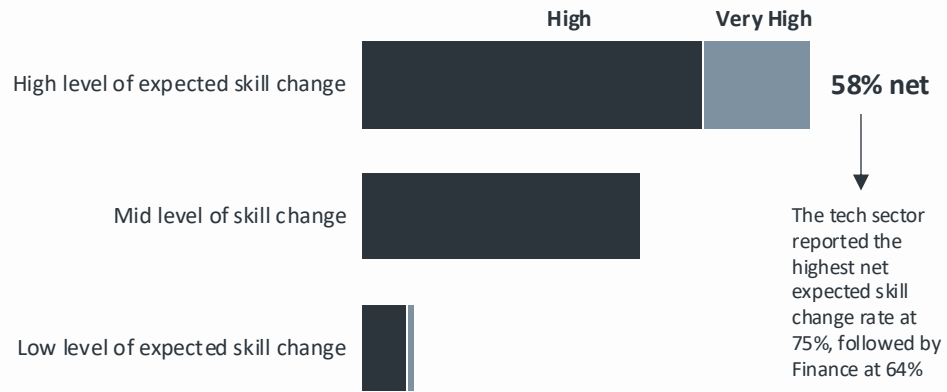
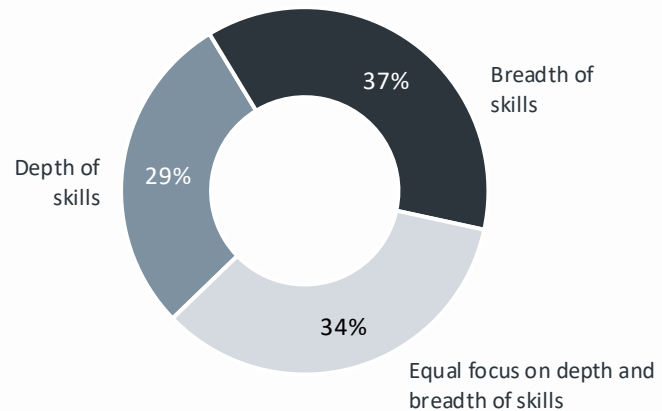**Executives and staff plan for a year of change on many fronts**

■ C-Suite   ■ All staff levels

	C-Suite	All staff levels
Significant changes on many fronts	36%	25%
Moderate changes on some front	49%	59%
Minimal changes on few fronts	14%	14%

Top sector priorities in year ahead	Overall	Tech	Mfg.	Prof. Services	Retail	Health-care	Finance	Media	Public Sector
Improving operational efficiency/streamlining processes	55%	53%	59%	52%	45%	56%	57%	45%	69%
Introducing new technologies internally, e.g., AI	55%	61%	61%	51%	47%	52%	53%	43%	59%
Improving staff productivity/engagement/corporate culture	51%	49%	49%	58%	55%	53%	39%	45%	65%
Growing revenue in our core business/industry	48%	55%	47%	58%	56%	45%	54%	45%	14%
Innovation/launching new products or services	38%	48%	49%	35%	33%	33%	36%	40%	30%
Increasing cash flow/fortifying financial position	34%	35%	33%	30%	47%	36%	37%	38%	15%
Entering new markets/customer segments	22%	21%	27%	16%	27%	26%	23%	21%	6%
Merger/Acquisition/Business unit selloff/IPO	10%	13%	10%	9%	11%	11%	10%	24%	3%

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Change extends to skills needs across sectors

	High	Very High	
High level of expected skill change			**58% net**
Mid level of skill change			
Low level of expected skill change			

The tech sector reported the highest net expected skill change rate at 75%, followed by Finance at 64%

Companies continue to embrace depth and breadth of skills

Breadth of skills 37%

Depth of skills 29%

Equal focus on depth and breadth of skills 34%

Sector priorities in developing depth and/or breadth of staff skills

	Tech	Manufacturing	Professional Services	Retail
1.	Cybersecurity	Cybersecurity	Cybersecurity	Project Mgt.
2.	Integration/API	AI/ML	Project Mgt.	Cybersecurity
3.	Data/Analytics	Automation	Automation	AI/ML
4.	AI/ML	Data/Analytics	AI/ML	Data/Analytics
5.	Project Mgt.	Project Mgt.	Data/Analytics	Integration/API

	Healthcare	Finance	Media	Public Sector
1.	Cybersecurity	Cybersecurity	Cybersecurity	Cybersecurity
2.	Project Mgt.	Data/Analytics	Data/Analytics	Project Mgt.
3.	Data/Analytics	AI/ML	Analytics/BI	Analytics/BI
4.	AI/ML	Automation	Integration/API	Integration/API
5.	Automation	Integration/API	AI/ML	Data/Analytics

Across all sectors, cybersecurity ranks as the #1 priority in developing depth and/or breadth of skills among staff (aggregate reporting of 55%)

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Artificial intelligence and machine learning skills development intent profiling

As an enabling technology AI tools and components can be found across a range of business applications. There are likely many companies providing staff training in areas such as cybersecurity or data, which may entail coverage of AI in some capacity (potentially understating the degree to which AI and machine learning training is occurring)
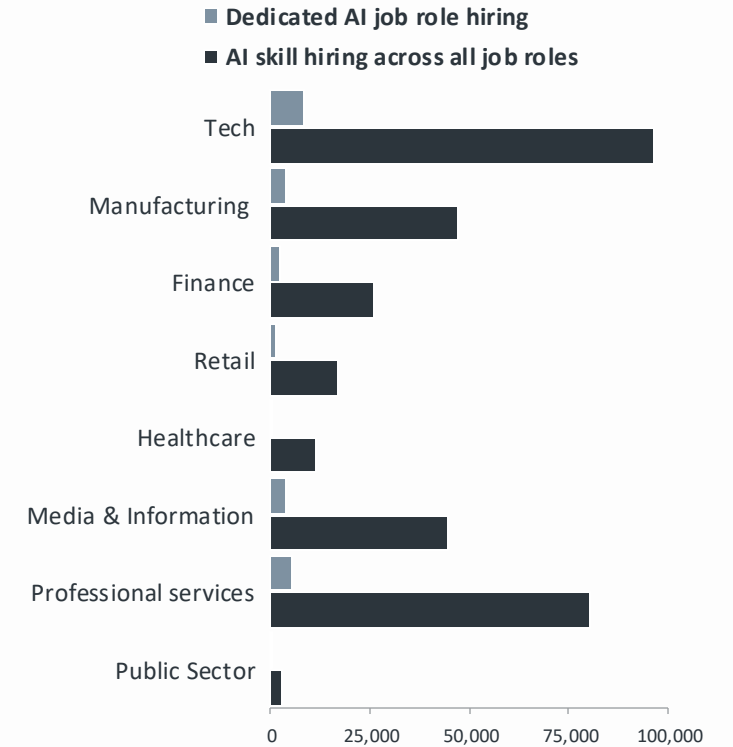
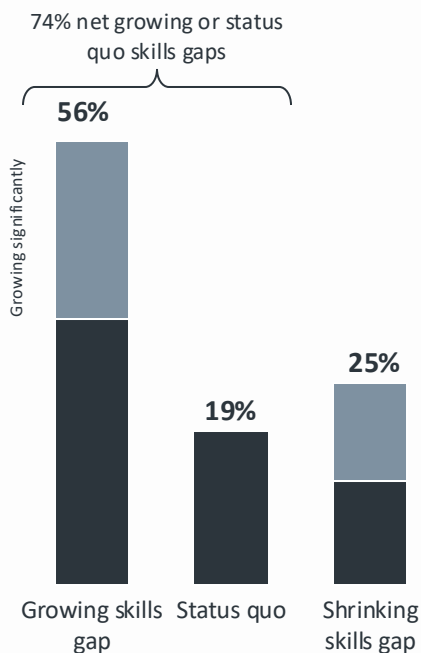| Category	Percentage
Overall	37%
Tech	44%
Manufacturing	42%
Finance	39%
Retail	40%
Healthcare	35%
Media & Information	29%
Professional Services	35%
Public Sector	22%
Very large firms	39%
Large firms	38%
Medium firms	37%
Small firms	36%
Business staff	32%
Tech staff	42%
C-suite staff	32%

AI/ML hiring activity via job postings

The majority of hiring activity for AI and machine learning continues to occur at the skill level, such as companies wanting a software developer, data analyst or marketing specialist to have some degree of fluency in understanding and using AI-enabled tools.

Companies are starting to ramp up their hiring of dedicated AI roles, such as an AI engineer or AI architect, but at this point they represent a relatively small share of the total.

■ **Dedicated AI job role hiring**
■ **AI skill hiring across all job roles**

Tech
Manufacturing
Finance
Retail
Healthcare
Media & Information
Professional services
Public Sector

0   25,000   50,000   75,000   100,000

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Skills gaps persistently problematic across sectors

74% net growing or status quo skills gaps

Growing significantly

56% Growing skills gap

19% Status quo

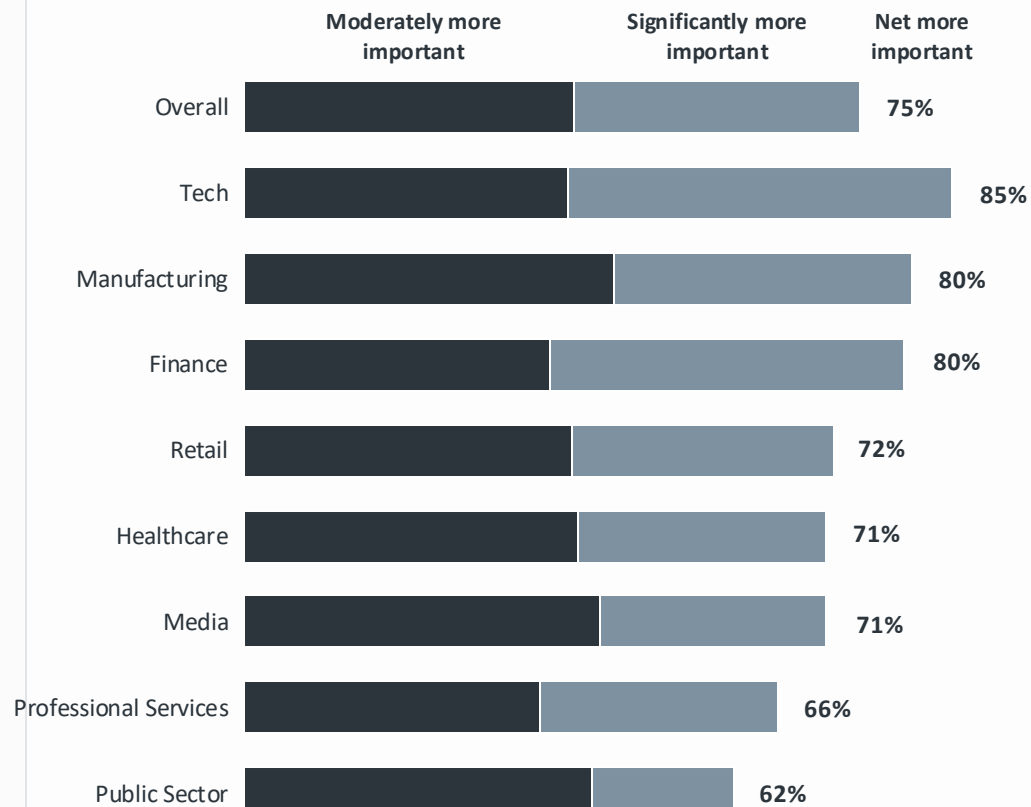**25%** Shrinking skills gap

C-suite company respondents rate skills gaps as growing at a slightly higher rate than staff at other levels.

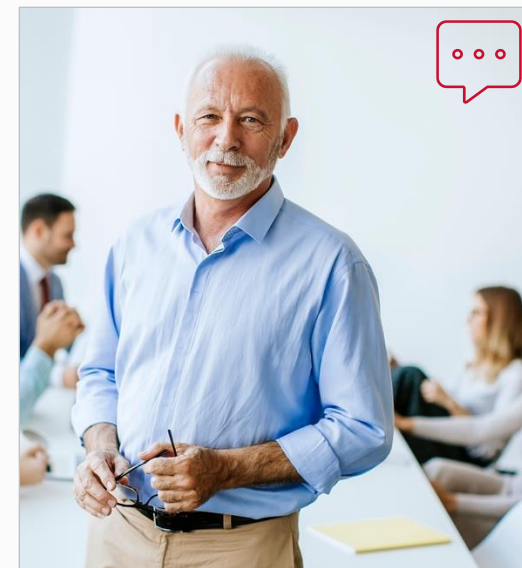Companies in the tech, finance, retail and manufacturing sectors also report slightly higher rates.

A majority of companies do not have formal strategies in place to proactively address skills gaps.

Upskilling/Reskilling increase in importance across sectors

Sector	Moderately more important / Significantly more important	Net more important
Overall		75%
Tech		85%
Manufacturing		80%
Finance		80%
Retail		72%
Healthcare		71%
Media		71%
Professional Services		66%
Public Sector		62%

Top reasons for pursuing upskilling/reskilling strategies

1 Retention strategy to provide staff development and advancement opportunities

2 Competitive strategy to elevate internal technical and/or digital skills

3 Cost or efficiency gains of developing talent internally

4 Proactive strategy to address skills gaps and/or job role obsolescence
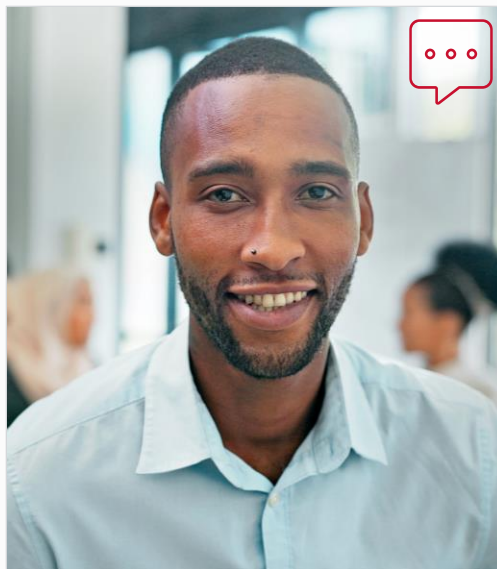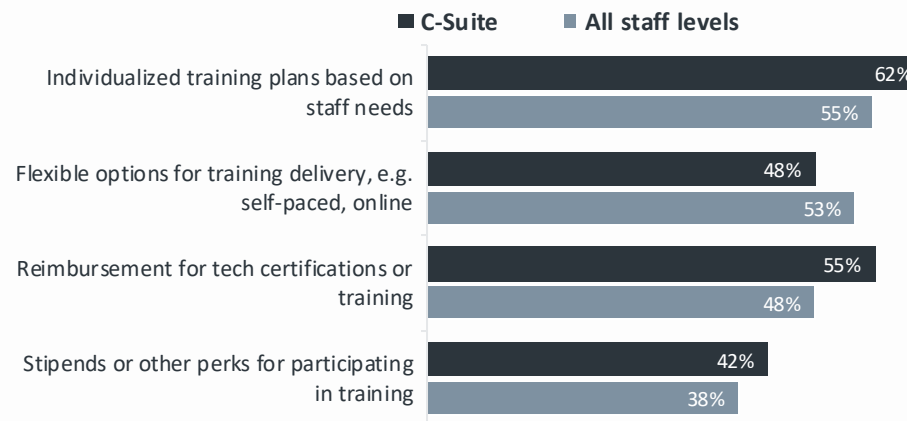
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81%

Percent of companies that report factoring industry-recognized technical certifications, such as from CompTIA or Microsoft, into the hiring process for tech positions

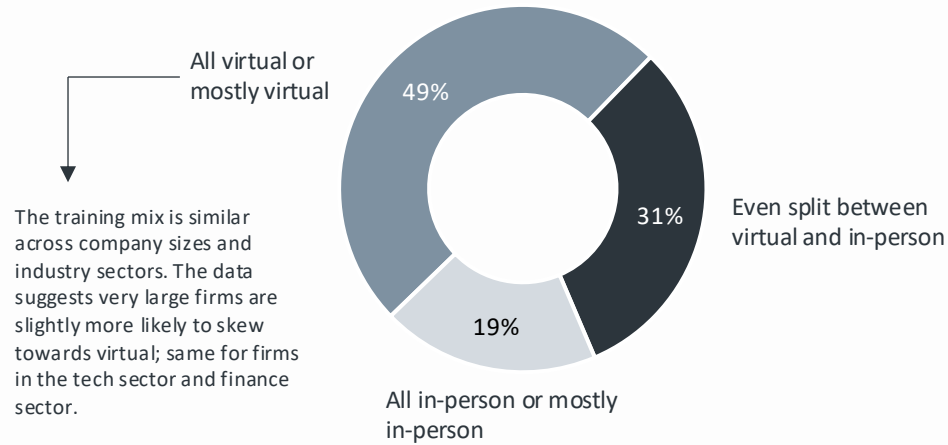## Top reasons for relying on industry-recognized technical certifications

1 Alignment to specific job roles and the skills/competencies associated with those roles

Alignment to specific skills and competencies is especially critical to very large companies (10,000+ staff); 57% vs. 49% for small firms

2 Time savings in skills-based hiring evaluations of candidates

3 Meet regulatory requirements / compliance needs

4 More up-to-date assessment of current technologies than 4-yr degrees

Slightly higher factor among companies in the tech sector

Strategies to motivate staff and generate more ROI from training

■ C-Suite ■ All staff levels

Strategy	C-Suite	All staff levels
Individualized training plans based on staff needs	62%	55%
Flexible options for training delivery, e.g. self-paced, online	48%	53%
Reimbursement for tech certifications or training	55%	48%
Stipends or other perks for participating in training	42%	38%

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Corporate training delivery mix spans modalities

All virtual or mostly virtual

49%

31% — Even split between virtual and in-person

19%

All in-person or mostly in-person

The training mix is similar across company sizes and industry sectors. The data suggests very large firms are slightly more likely to skew towards virtual; same for firms in the tech sector and finance sector.

Top reported challenges in evaluating training program effectiveness

1 Connecting training to business outcomes [44%] → More of a focus in the tech and Finance sectors

2 Identifying training efficacy metrics and how to track them [44%]

3 Quantifying impact training on productivity/quality of work [43%]

The data indicates a slightly higher concern among C-suite staff

4 Calculating ROI over time [32%]

5 Not having benchmarks to provide context [31%]

Companies take different approaches to digital fluency training

■ **Overall across sectors**   ■ **Tech sector**

Build or use proprietary in-house training
- 52%
- 54%

Purchase training from external training or learning content provider
- 47%
- 56%

Subsidize employees pursuing external training or certification
- 45%
- 49%

Subsidize post-secondary degree
- 30%
- 36%

The data indicates tech sector is more likely to consider purchasing training from third party training providers.

Tech sector respondents are also slightly more likely to subsidize employees wanting to pursue external training or certification.

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Industry Sector Hiring Snapshots

Analysis of job posting data to profile hiring activity across industry sectors

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Tech sector hiring snapshot
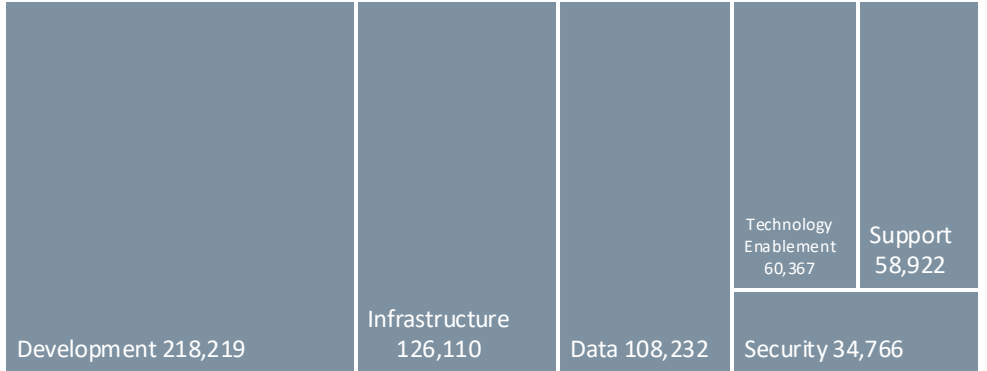
	NAICS	All job listings 2024	Tech job listings 2024	Tech as % of all listings
Tech total		1,913,301	606,616	32%
Subsector breakouts				
Software Development Services	541511	405,719	167,385	41%
Tech Services	541512	255,652	120,669	47%
Software Product	513210	161,632	48,760	30%
Cloud Infrastructure and Hosting	518	138,925	41,086	30%
Tech Manufacturing	334	358,462	96,884	27%

Source: Lightcast job posting data | CompTIA

Sector priorities in developing depth and/or breadth of staff skills

Hiring activity via active employer job postings in the manufacturing sector for 2024 | Segmentation by CompTIA tech job family taxonomy

Development 218,219 | Infrastructure 126,110 | Data 108,232 | Technology Enablement 60,367 | Support 58,922 | Security 34,766

Examples of most active tech hiring firms in tech

Sorted alphabetically | based on tech job posting volumes for 2024

- Apple
- Capgemini
- Google
- Infosys
- Intel
- L3Harris Technologies
- Meta
- Microsoft
- Oracle
- TEKsystems

Tech sector hiring activity by detailed tech job role

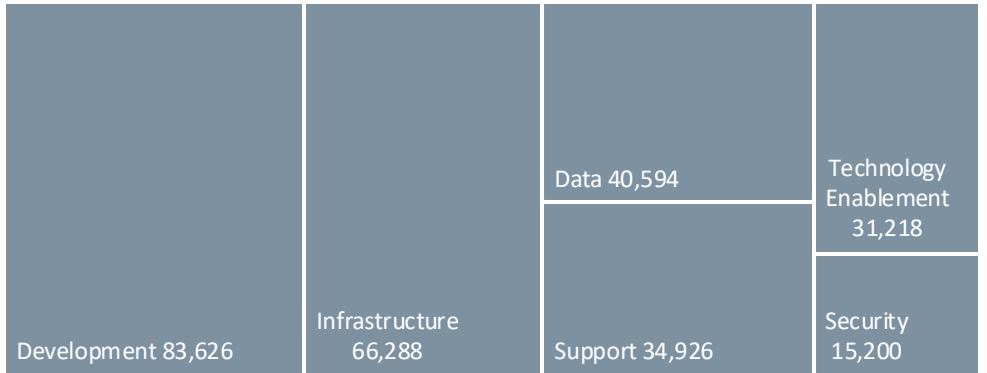| Job family	Most active job role for hiring activity in sector	Second most active	Third most active
Cybersecurity	Cybersecurity Engineer	Cybersecurity Manager	Cybersecurity Analyst
Data	Business Intelligence Analyst	Database Admin / Developer	Data Scientist
Infrastructure	Systems Engineer / Architect	Network Engineer / Architect	Network / Systems Administrator
Software Development	Software Developer / Engineer	Web Developer	Software QA / Tester
Support	Tech Support Specialist	Help Desk Technician	IT Specialist
Tech Enablement	Technology Consultant	IT Project Manager	IT Manager / Director

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Manufacturing sector hiring snapshot

	NAICS	All job listings 2024	Tech job listings 2024	Tech as % of all listings
Manufacturing total	31-33	2,597,879	271,852	10%
Subsector breakouts				
Transportation Equipment Mfg.	336	375,852	60,720	16%
Petroleum, Coal, Chemical and Pharmaceutical Products Mfg.	324, 325	415,689	33,707	8%
Machinery Manufacturing	333	212,856	17,937	8%
Food Manufacturing	311	228,148	6,081	3%

Source: Lightcast job posting data | CompTIA

Sector priorities in developing depth and/or breadth of staff skills

Hiring activity via active employer job postings in the manufacturing sector for 2024 | Segmentation by CompTIA tech job family taxonomy

Development 83,626
Infrastructure 66,288
Data 40,594
Support 34,926
Technology Enablement 31,218
Security 15,200

Examples of most active tech hiring firms in manufacturing

Sorted alphabetically | based on tech job posting volumes for 2024

- Apple
- CAI
- Ford
- General Dynamics
- Intel
- Johnson & Johnson
- L3Harris Technologies
- Lockheed Martin
- Northrop Grumman
- Raytheon Technologies

Manufacturing sector hiring activity by detailed tech job role

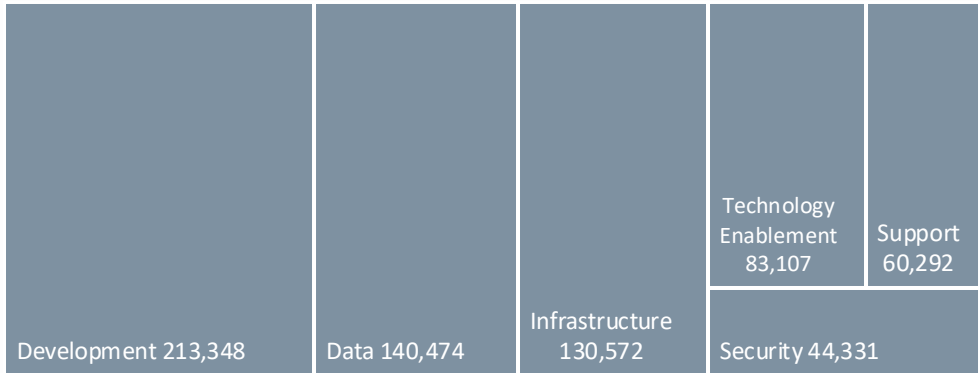| Job family	Most active job role for hiring activity in sector	Second most active	Third most active
Cybersecurity	Cybersecurity Engineer	Cybersecurity Manager	Cybersecurity Analyst
Data	Data Scientist	Database Architect	Business Intelligence Analyst
Infrastructure	Systems Engineer	Network Engineer	Computer Hardware Engineer
Software Development	Software Developer	Software QA / Tester	UI / UX Designer / Developer
Support	Tech Support Specialist	Repair / Service Technician	IT Specialist / Engineer
Tech Enablement	IT Manager / Director	Technology Consultant	IT Project Manager

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Professional Services sector hiring snapshot

	NAICS	All job listings 2024	Tech job listings 2024	Tech as % of all listings
Professional Services total	54	3,193,953	672,124	21%
Subsector breakouts				
Legal, Accounting, Architectural and Related	5411, 5412,5413	937,583	105,396	11%
Management, Marketing, PR, R&D, Environmental and Related	5416	786,174	151,740	19%

Note: within the professional services sector is the tech services subsector (not shown as a breakout)

Source: Lightcast job posting data | CompTIA

Sector priorities in developing depth and/or breadth of staff skills

Hiring activity via active employer job postings in the manufacturing sector for 2024 | Segmentation by CompTIA tech job family taxonomy

Development 213,348 | Data 140,474 | Infrastructure 130,572 | Security 44,331 | Technology Enablement 83,107 | Support 60,292

Examples of most active tech hiring firms in professional services

Sorted alphabetically | based on tech job posting volumes for 2024

- Accenture
- Booz Allen Hamilton
- CACI International
- Canonical Group
- Cognizant Technology Solutions
- Deloitte
- Leidos
- PwC
- SAIC
- TEKsystems

Professional Services sector hiring activity by detailed tech job role

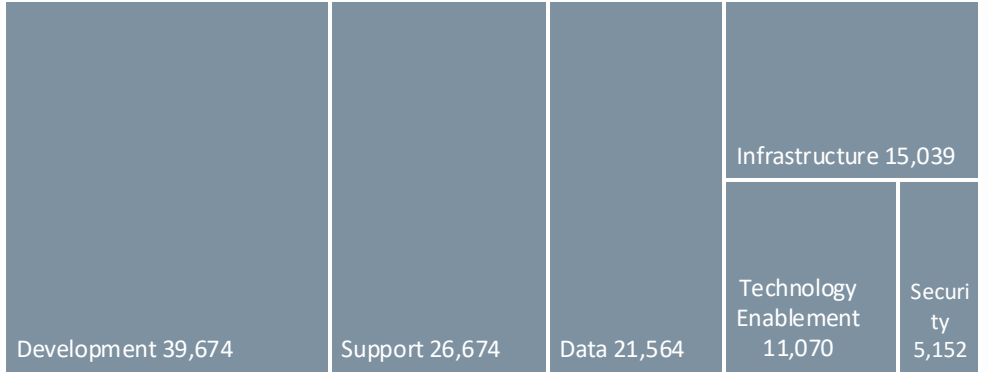| Job family	Most active job role for hiring activity in sector	Second most active	Third most active
Cybersecurity	Cybersecurity Engineer	Cybersecurity Analyst	Cybersecurity Manager
Data	Business Intelligence Analyst	Database Admin / Developer	Database Architect
Infrastructure	Systems Engineer / Architect	Network Engineer / Architect	Network / Systems Administrator
Software Development	Software Developer / Engineer	Web Developer	Software QA / Tester
Support	Tech Support Specialist	Help Desk Technician	IT Specialist
Tech Enablement	Technology Consultant	IT Project Manager	IT Manager / Director

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Retail sector hiring snapshot

	NAICS	All job listings 2024	Tech job listings 2024	Tech as % of all listings
Retail total	44-45	3,761,764	119,173	3%
Subsector breakouts				
Sporting Good, Hobby, Book, Misc.	459	496,925	47,615	10%
Furniture, Home Furnishings, Electronics, Appliances	449	207,547	13,365	6%
Grocery Stores, Food, Beverage	445	653,108	9,278	1%
General Merchandise, Department Stores and Warehouse Clubs	455	730,986	8,439	1%

Source: Lightcast job posting data | CompTIA

Sector priorities in developing depth and/or breadth of staff skills

Hiring activity via active employer job postings in the manufacturing sector for 2024 | Segmentation by CompTIA tech job family taxonomy

Development 39,674 | Support 26,674 | Data 21,564 | Technology Enablement 11,070 | Infrastructure 15,039 | Security 5,152

Examples of most active tech hiring firms in retail

Sorted alphabetically | based on tech job posting volumes for 2024

- 7-Eleven
- Amazon
- Best Buy
- Chewy
- CVS Health
- Home Depot
- Kroger
- Lowe's
- Walgreens
- Walmart

Retail sector hiring activity by detailed tech job role

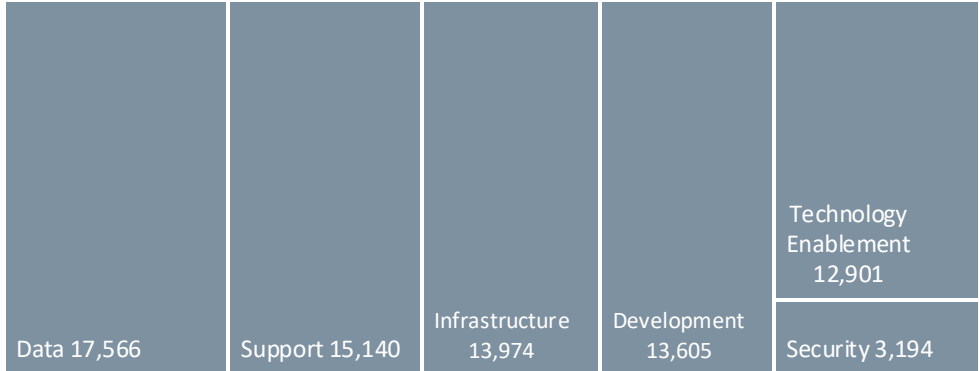| Job family	Most active job role for hiring activity in sector	Second most active	Third most active
Cybersecurity	Cybersecurity Engineer	Cybersecurity Manager	Cybersecurity Analyst
Data	Data Scientist	Database Admin / Developer	E-Commerce Analyst / Specialist
Infrastructure	Systems Engineer / Architect	Network Engineer / Architect	Data Center Technician
Software Development	Software Developer / Engineer	UI / UX Designer / Developer	Web Developer
Support	Repair / Service Technician	Tech Support Specialist	Help Desk Technician
Tech Enablement	IT Manager / Director	IT Project Manager	Technology Consultant

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Healthcare sector hiring snapshot

	NAICS	All job listings 2024	Tech job listings 2024	Tech as % of all listings
Health Care and Social Assistance total	62	6,110,666	76,380	1%
Subsector breakouts				
Physician Offices, Dentist Offices, Ambulatory Services and related	621	2,712,480	31,337	1%
Hospitals	622	1,915,903	27,432	1%
Social Assistance and Child Care Services	624	648,750	10,299	2%

Source: Lightcast job posting data | CompTIA

Sector priorities in developing depth and/or breadth of staff skills

Hiring activity via active employer job postings in the manufacturing sector for 2024 | Segmentation by CompTIA tech job family taxonomy

| Data 17,566 | Support 15,140 | Infrastructure 13,974 | Development 13,605 | Technology Enablement 12,901 |
| | | | | Security 3,194 |

Examples of most active tech hiring firms in healthcare

Sorted alphabetically | based on tech job posting volumes for 2024

- American Red Cross
- Centene
- HCA Healthcare
- Health First
- Intermountain Health
- Kaiser Permanente
- Mayo Clinic College of Medicine
- Providence
- Trinity Health
- UPMC Mercy School of Nursing

Healthcare sector hiring activity by detailed tech job role

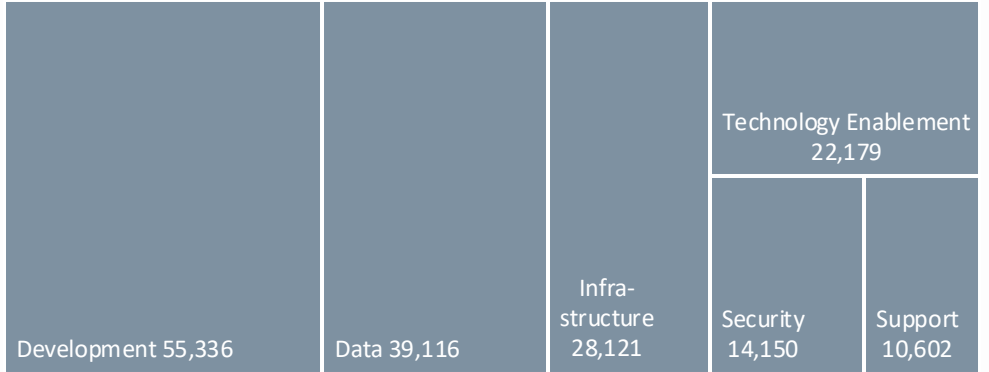| Job family	Most active job role for hiring activity in sector	Second most active	Third most active
Cybersecurity	Cybersecurity Manager	Cybersecurity Analyst	Cybersecurity Engineer
Data	Data Analyst	Database Architect	Data Manager
Infrastructure	Systems Analyst	Network Engineer / Architect	Network / Systems Administrator
Software Development	Software Developer / Engineer	Computer Programmer	Mobile Applications Developer
Support	Tech Support Specialist	Help Desk Technician	IT Specialist
Tech Enablement	IT Manager / Director	Technology Consultant	IT Project Manager

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Finance and Insurance sector hiring snapshot

	NAICS	All job listings 2024	Tech job listings 2024	Tech as % of all listings
Finance and Insurance total	52	1,530,769	169,504	11%
Subsector breakouts				
Finance and related	521,522,523,525	857,105	111,551	13%
Insurance and related	524	666,348	56,070	8%

Source: Lightcast job posting data | CompTIA

Sector priorities in developing depth and/or breadth of staff skills

Hiring activity via active employer job postings in the manufacturing sector for 2024 | Segmentation by CompTIA tech job family taxonomy

Development 55,336	Data 39,116	Infra-structure 28,121	Technology Enablement 22,179	
			Security 14,150	Support 10,602

Examples of most active tech hiring firms in finance & insurance

Sorted alphabetically | based on tech job posting volumes for 2024

- Bank of America
- Capital One
- Citigroup
- Elevance Health
- Fisher Investments
- Humana
- JPMorgan Chase
- Lincoln Financial Group
- Nelnet
- Wells Fargo

Finance and Insurance sector hiring activity by detailed tech job role

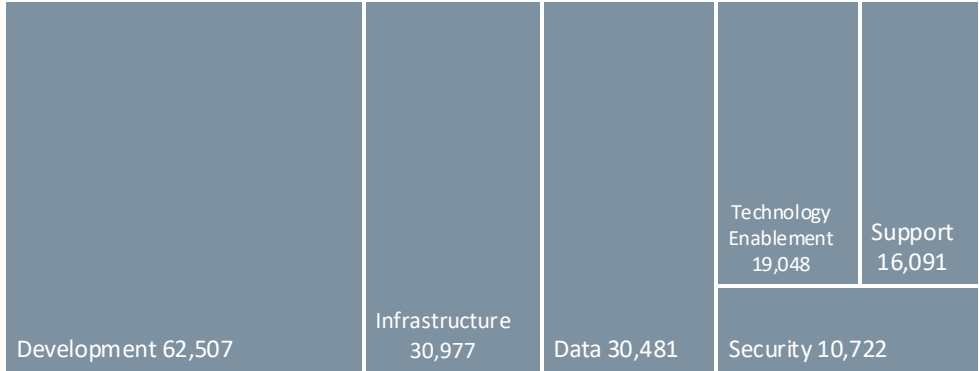| Job family	Most active job role for hiring activity in sector	Second most active	Third most active
Cybersecurity	Cybersecurity Engineer	Cybersecurity Manager	Cybersecurity Analyst
Data	Data Analyst	Data Scientist	Database Architect
Infrastructure	Systems Engineer / Architect	Systems Analyst	Network Engineer / Architect
Software Development	Software Developer / Engineer	Web Developer	UI / UX Designer / Developer
Support	Tech Support Specialist	IT Specialist	Help Desk Technician
Tech Enablement	IT Manager / Director	Technology Consultant	IT Project Manager

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Media and Information sector hiring snapshot

	NAICS	All job listings 2024	Tech job listings 2024	Tech as % of all listings
Media and Information total	51	812,294	169,826	21%
Subsector breakouts				
Broadcasting, Content Providers and Media Streaming Services	516	89,394	13,500	15%
Motion Picture and Music	512	38,453	4,189	11%

Note: within the media and information sector are the cloud infrastructure, software product, and search portal and web services subsectors (not shown as a breakout)

Source: Lightcast job posting data | CompTIA

Sector priorities in developing depth and/or breadth of staff skills

Hiring activity via active employer job postings in the manufacturing sector for 2024 | Segmentation by CompTIA tech job family taxonomy

Development 62,507
Infrastructure 30,977
Data 30,481
Security 10,722
Technology Enablement 19,048
Support 16,091

Examples of most active tech hiring firms in media and information

Sorted alphabetically | based on tech job posting volumes for 2024

- Comcast
- Concentrix
- Ensono
- Google
- Lumen Technologies
- Meta
- Microsoft
- Oracle
- Peraton
- Wolters Kluwer

Media and Information sector hiring activity by detailed tech job role

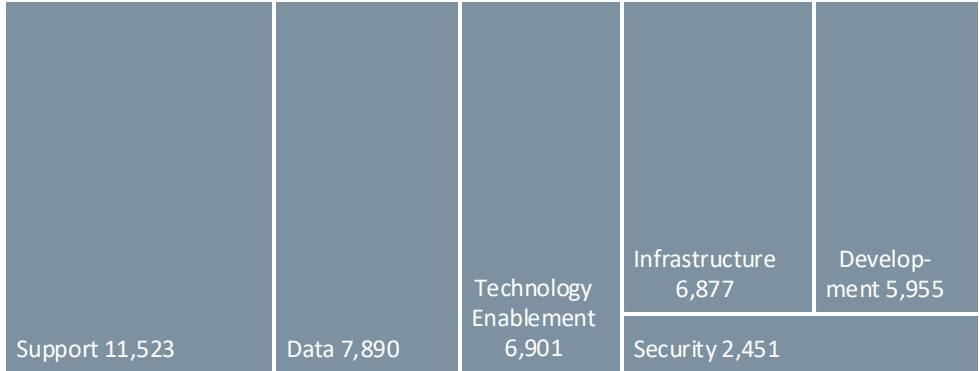| Job family	Most active job role for hiring activity in sector	Second most active	Third most active
Cybersecurity	Cybersecurity Engineer	Cybersecurity Manager	Cybersecurity Analyst
Data	Data Scientist	Database Architect	Data Analyst
Infrastructure	Systems Engineer / Architect	Network Engineer / Architect	Cloud Architect
Software Development	Software Developer / Engineer	Web Developer	UI / UX Designer / Developer
Support	Tech Support Specialist	Satellite / Broadband Technician	IT Specialist
Tech Enablement	Technology Consultant	IT Manager / Director	IT Project Manager

Public sector hiring snapshot

	NAICS	All job listings 2024	Tech job listings 2024	Tech as % of all listings
Public sector total	92	799,458	41,597	5%

Source: Lightcast job posting data | CompTIA

Sector priorities in developing depth and/or breadth of staff skills

Hiring activity via active employer job postings in the manufacturing sector for 2024 | Segmentation by CompTIA tech job family taxonomy

Support 11,523 | Data 7,890 | Technology Enablement 6,901 | Infrastructure 6,877 / Security 2,451 | Develop-ment 5,955

Examples of most active tech hiring firms in public sector

Sorted alphabetically | based on tech job posting volumes for 2024

- City of New York
- State of California
- State of Florida
- State of Minnesota
- State of New York
- State of South Carolina
- State Of Texas
- State of Washington
- United States Dept. of Defense
- United States Dept. of the Treasury

Public sector hiring activity by detailed tech job role

Job family	Most active job role for hiring activity in sector	Second most active	Third most active
Cybersecurity	Cybersecurity Analyst	Cybersecurity Manager	Cybersecurity Specialist
Data	Database Architect	Data Analyst	Data Manager
Infrastructure	Systems Analyst	Network / Systems Administrator	Systems Engineer / Architect
Software Development	Software Developer / Engineer	Computer Programmer	Software QA / Tester
Support	Tech Support Specialist	IT Specialist	Repair / Service Technician
Tech Enablement	IT Manager / Director	Technology Consultant	IT Project Manager

Methodology

CompTIA's Industry Workforce Trends study was conducted via a quantitative survey fielded online during July 1 -15, 2024. The full survey sample of n=1,524 was segmented across target industry sectors. The full sample will have a margin of error proxy of approximately +/- 2.6 percentage points.

Subsegments of the data will have higher margin of error.

CompTIA, Inc. is a member of the market research industry's Insights Association and adheres to its internationally respected Code of Standards. Any questions regarding the study should be directed to CompTIA Research and Market Intelligence staff at research@comptia.org.

Appendix

Industry sector profiling

Sector	NAICS	Total Employment	Tech Occupation Employment	% Tech Occupation Employment	Total Business Establishments	Large Business Establishments (1,000+ staff)
Tech	40 codes	6,242,065	2,517,130	40%	509,091	374
Manufacturing	31-33	13,124,428	380,790	3%	399,967	1,013
Finance	52	6,562,642	524,685	8%	583,618	580
Retail	44-45	16,195,873	84,670	1%	1,079,629	95
Healthcare	62	22,616,396	139,280	1%	1,983,830	1,964
Information and media	51	3,108,430	833,655	27%	295,397	218
Professional services	54	12,101,369	2,152,647	18%	1,726,289	449
Public Sector	92	22,164,500	525,968	2%	na	na

Source: Lightcast | US Bureau of Labor Statistics | CompTIA

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