

MINNESOTA

The State of Tech Talent

2024 Talent Supply
and Demand Analysis



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Minnesota Technology Association

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About This Report

The Minnesota Technology Association is leading a collaborative effort to address workforce challenges facing technology-enabled businesses in Minnesota and helping to expand the pool of talent needed to fill the information technology jobs of the future. With financial support from the Minnesota Department of Employment and Economic Development (DEED), MnTech retained the services of RealTime Talent to do an in-depth analysis of Minnesota's tech talent supply and demand, offering a data-driven forecast that can help shape our state's workforce strategies.

With technological advancement reshaping every sector of the economy, the demand for IT talent is set to evolve, with approximately 39,000 job openings expected to arise over the next five years. These openings reflect both modest growth in new tech roles and a significant need to backfill positions due to retirements, industry exits, and out-of-state migration. This labor market dynamic puts pressure on employers to not only attract new talent, but also retain the experienced professionals they currently have.

This report will examine the impact of these trends on 10 specific IT occupations, including a deeper dive into four of these: Software Developer, Computer User Support Specialist, Computer Systems Analyst, and Information Security Analyst. These are not only some of the most in-demand roles, but also ones that are most accessible for entry-level talent.

A key factor in the future of IT employment is the rapid evolution of generative AI technologies, such as GitHub CoPilot, which have already begun to transform the role of software developers. By enhancing productivity and automating routine coding tasks, these AI-driven tools are reshaping the skills required in the workforce. As businesses adopt these technologies, demand may shift towards higher-order technical and problem-solving abilities, even while the overall number of jobs in some areas might stabilize or decrease.

As Minnesota navigates this evolving landscape, the collaboration between the public and private sectors will be vital. Policymakers, educators, and businesses must work together to ensure that talent supply aligns with future demand. This report provides actionable insights to guide those efforts, emphasizing the importance of agility and foresight in workforce planning.

In partnership,

Jeff Tollefson

President & CEO

Minnesota Technology Association

Erin Olson

Senior Director of Strategic Research

RealTime Talent

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Research Strategist

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Collaborating Partners



The Minnesota Technology Association (MnTech) is a coalition of member companies united in building a stronger tech ecosystem and innovation economy in Minnesota. MnTech works to ensure that Minnesota’s technology-driven companies have access to exceptional talent, dedicated public policy advocates, and are part of an innovative, inclusive technology community. For more than 40 years, the Minnesota Technology Association has helped nurture each of these attributes within our state, enabling Minnesota businesses, professionals, and communities to thrive. Learn more at mntech.org.



Formed in 2016 out of the work of the Itasca Project, RealTime Talent is an employer-led public-private collaborative under the fiscal sponsorship of the Minneapolis Regional Chamber Foundation, focused on accelerating alignment of Minnesota’s workforce by creating more informed, market-oriented decisions, ensuring the state’s economy has the talent it needs, and helping Minnesotans prepare for well-paying careers. RealTime Talent brings relevant and current labor market information, customized research, and human-centered facilitation and consulting, fosters accelerated solutions for the talent pipeline and encourages market-oriented data-informed decisions in recruitment, education, and training processes. Learn more at realtimetalent.org



Minnesota Department of Employment & Economic Development

The Minnesota Department of Employment and Economic Development (DEED) is the state's principal economic development agency. DEED programs promote business recruitment, expansion, and retention; international trade; workforce development; and community development, and facilitate an economic environment to produce jobs and improve the quality of the state’s workforce. This report is being produced as part of DEED’s Drive for Five workforce initiative. Learn more at mn.gov/deed.

Introduction and Sector Overview

Technology careers play an essential role in sustaining Minnesota businesses. Tech Industries rely in particular on Tech Talent, contributing \$37.5 billion to Minnesota's GDP in 2023.

111,540

Tech Jobs Held by Professionals in Minnesota

3.6%

Of all Employment in Minnesota is in Tech Occupations

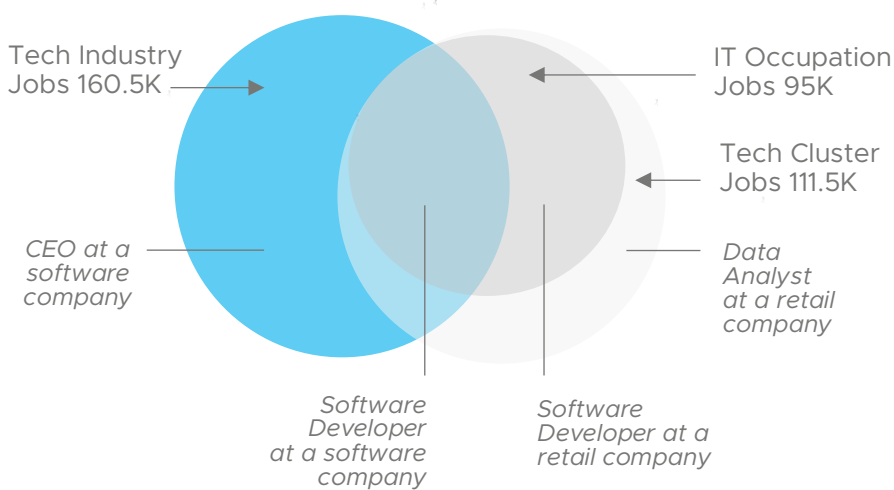
37,945

Unique Tech Job Postings Over the Last 12 Months in Minnesota, representing 6% of all job postings (down -15% from the prior 12-month period)

18,044

Tech Business Establishments in Minnesota (firms with payroll)

Tech Industry and Occupation Clusters



Employment in Tech Occupations

High Demand for Skilled Talent

- Employment rose 4.5% between 2019Q1 and 2024Q1
- Employment is forecast to grow by 0.8% on average annually through 2028

High Labor Shortage Persists

- Severely low unemployment in Tech Occupations (1.7%) means a tight labor market
- All but two Tech Occupations in talent shortage
- Industry's top purchases are from Temporary Help Services, to a tune of over \$1B spent in 2023
- Hybrid-remote work prevalence has changed recruitment practices and talent expectations

High Talent Misalignment

- Skills, education, geography, and bias present barriers
- Minnesota is last in the nation in access to foundational Computer Science education
- Educational requirements of positions do not match talent skills
- Rapid upskilling and reskilling required to keep pace with sector innovation

Tech Cluster Occupations in Minnesota – Baseline Forecast, 2024Q1¹

Occupation	Current					5-Year History		5-Year Baseline Forecast				
	Empl	Avg Ann Wages ²	LQ	Unempl	Unempl Rate	Empl Change	Ann % Change	Total Demand	Exits	Transfers	Empl Change	Ann % Change
Programming & Software Development	64,398	\$107,800	1.01	1,263	1.9%	4,398	1.4%	23,417	6,898	12,816	3,704	1.1%
System Networks	39,969	\$125,000	1.05	489	1.2%	824	0.4%	13,204	4,503	7,676	1,025	0.5%
Data Analysis	7,173	\$92,600	0.69	172	2.2%	-149	-0.4%	2,693	1,107	1,542	44	0.1%
Information Technology Occupations	95,072	\$108,100	1.03	1,610	1.7%	3,861	0.8%	32,952	10,473	18,154	4,325	0.9%
Tech Cluster Occupations	111,540	\$113,000	1.00	1,923	1.7%	5,073	0.9%	39,314	12,508	22,034	4,773	0.8%
Total – All Occupations	3,103,775	\$69,000	1.00	89,472	2.8%	15,052	0.1%	1,629,916	729,502	923,342	-22,928	-0.1%

Source: JobsEQ® Data as of 2024Q1 unless noted otherwise

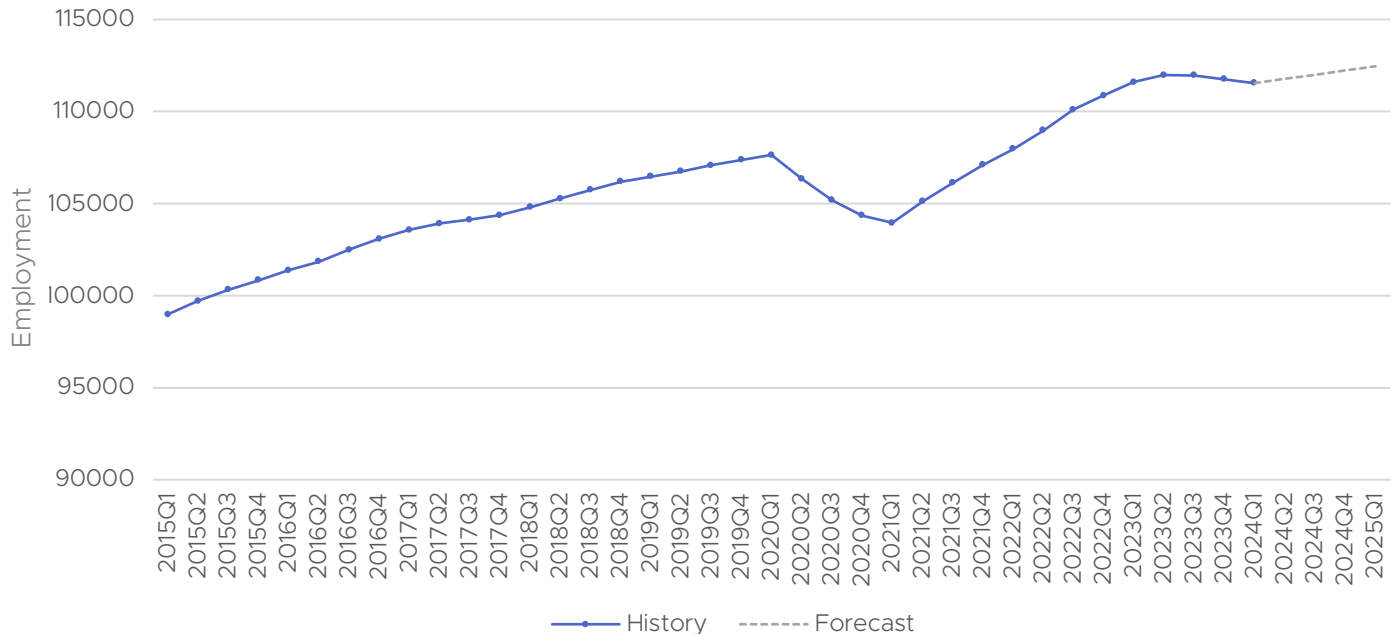
Note: Figures may not sum due to rounding. 1. Data based on a four-quarter moving average unless noted otherwise. 2. Wage data represent the average for all Covered Employment. 3. Data represent found online ads active within the last thirty days in the selected region; data represents a sampling rather than the complete universe of postings. Ads lacking zip code information but designating a place (city, town, etc.) may be assigned to the zip code with greatest employment in that place for queries in this analytic. Due to alternative county-assignment algorithms, ad counts in this analytic may not match that shown in RTI (nor in the popup window ad list).

+0.8%

39,314

Average Annual Forecast Growth in Tech Occupation Employment | Total Employment Demand over 5 Years

Tech Cluster Occupational Employment Trend and Forecast Under Baseline Scenario, Minnesota



Talent Demand Detail

Top Ten Tech Cluster Occupations by Employment, Wages, and Talent Shortage¹

		Current					5-Year Baseline Forecast		Gap Analysis				
SOC	Occupation	Empl	Avg Ann Wages ²	LQ	Unempl	Unempl Rate	Total Demand	Ann % Change	Average Monthly			Severity of Shortage	
									Postings	Hires	Gap	Talent	Postsecondary Degrees
15-1252	Software Developers	35,278	\$125,500	1.16	637	1.8%	13,451	1.8%	719	956	33%	High	High
15-1232	Computer User Support Specialists	13,500	\$68,700	0.98	197	1.4%	4,431	0.0%	297	390	31%	Mod	High
15-1211	Computer Systems Analysts	12,482	\$113,300	1.26	144	1.2%	3,906	0.4%	149	282	89%	High	High
11-3021	Computer and Information Systems Managers	9,847	\$177,400	0.94	127	1.3%	3,702	0.9%	24	289	1104%	High	High
15-1231	Computer Network Support Specialists	6,332	\$79,400	1.92	91	1.5%	2,180	0.2%	13	136	946%	High	High
15-1299	Computer Occupations, All Other	5,450	\$105,900	0.66	68	1.2%	1,795	0.3%	686	152	-78%	High	High
15-1244	Network and Computer Systems Administrators	5,033	\$104,400	0.79	60	1.1%	1,298	-0.3%	81	104	28%	Mod	High
15-1212	Information Security Analysts	2,890	\$126,800	0.90	11	0.4%	1,263	2.2%	43	97	126%	High	High
15-1241	Computer Network Architects	2,829	\$130,300	0.83	49	1.7%	711	-0.1%	104	53	-49%	Mod	High
15-1251	Computer Programmers	2,448	\$105,500	0.89	56	2.2%	510	-1.6%	37	51	38%	Low	High
	All Tech Cluster Occupations	111,540	\$113,000	1.00	1,923	1.7%	39,314	0.8%	3,097	3,019	-3%	High	High
	Total — All Occupations	3,103,775	\$69,000	1.00	89,472	2.8%	1,629,916	-0.1%	57,431	164,566	187%	Low	High

Source: Current, 5-Year Baseline Forecast, and Severity of Shortage data from [JobsEQ®](#) as of 2024Q1. Average Monthly Postings, Hires, and Gap from Lightcast Job Postings July 2023-June 2024. Note: Figures may not sum due to rounding. 1. Data based on a four-quarter moving average unless noted otherwise. 2. Wage data are the average for all Covered Employment 3. Data represent found online ads active within the last thirty days in the selected region; data represents a sampling rather than the complete universe of postings. Ads lacking zip code information but designating a place (city, town, etc.) may be assigned to the zip code with greatest employment in that place for queries in this analytic. Due to alternative county-assignment algorithms, ad counts in this analytic may not match that shown in RTI (nor in the popup window ad list).

INDUSTRY/OCCUPATION MIX

Tech Talent is primarily concentrated in the Computer Systems Design and Related Services (20.5%). The next highest industry of employment concentration is Management of Companies and Enterprises (11.3%), but Tech Talent is important across a wide range of sub-industries. Tech Talent wages are highest in the Computer and Peripheral Equipment Manufacturing Industry.

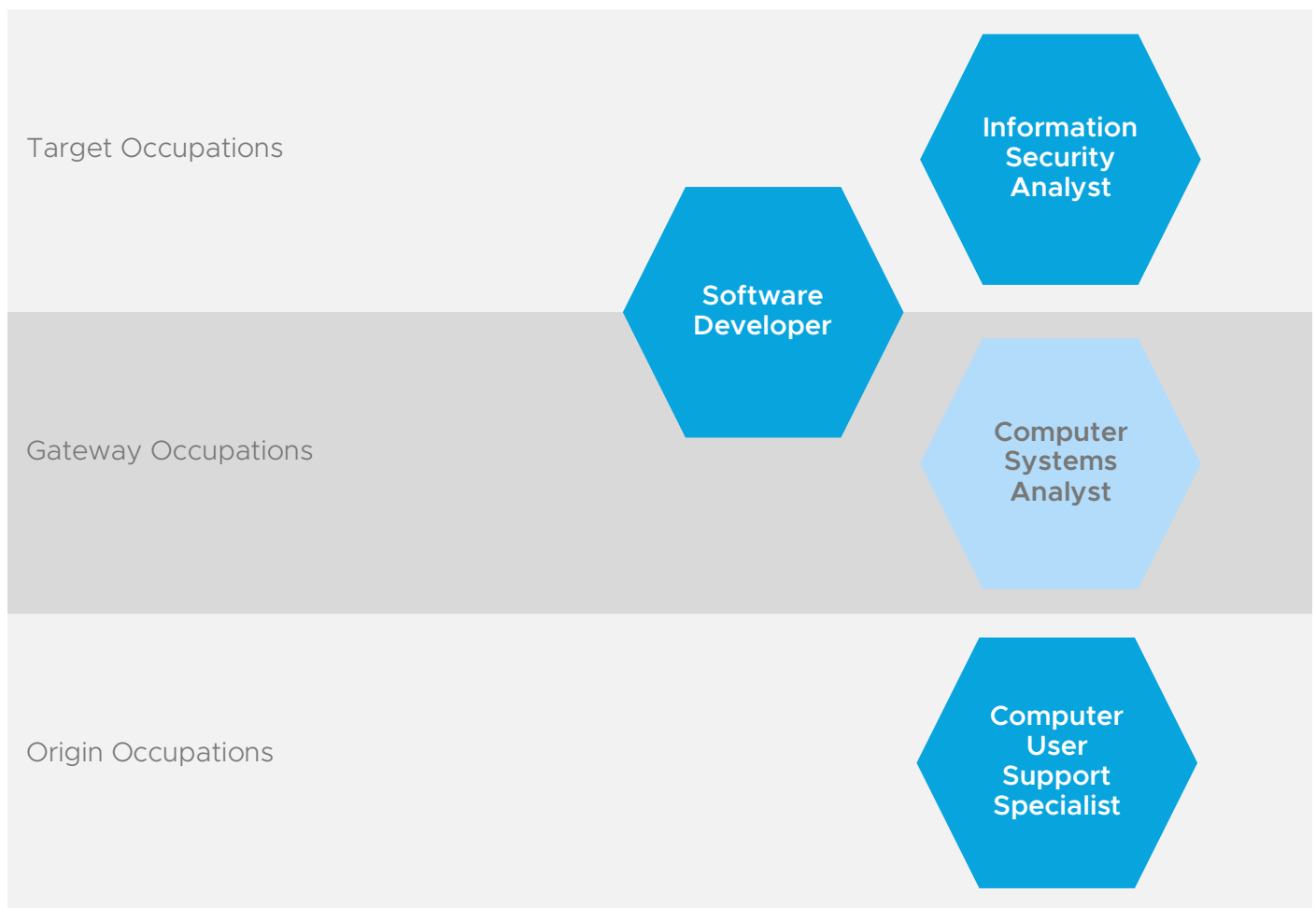
Top Industry Distribution for Tech Cluster Occupations in Minnesota

NAICS Code	Industry Title	Current			5-Year Demand			
		% of Occ Empl	Empl	Avg Ann Wages	Exits	Transfers	Empl Change	Total Demand
5415	Computer Systems Design and Related Services	20.5%	22,824	\$114,800	2,552	4,593	2,041	9,187
5511	Management of Companies and Enterprises	11.3%	12,658	\$118,900	1,412	2,454	514	4,380
5132	Software Publishers	4.7%	5,251	\$135,300	558	1,066	511	2,135
5241	Insurance Carriers	4.2%	4,680	\$111,300	519	892	128	1,539
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	4.0%	4,469	\$134,000	436	840	92	1,367
5221	Depository Credit Intermediation	3.7%	4,120	\$117,000	448	788	141	1,377
5182	Computing Infrastructure Providers, Data Processing, Web Hosting, and Related Services	3.4%	3,784	\$119,900	436	773	288	1,496
5416	Management, Scientific, and Technical Consulting Services	3.0%	3,389	\$112,400	388	681	198	1,267
5613	Employment Services	2.7%	3,011	\$99,200	358	590	0	948
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	2.6%	2,848	\$106,300	310	549	36	895
6113	Colleges, Universities, and Professional Schools	2.2%	2,414	\$105,300	272	458	-18	712
5192	Web Search Portals, Libraries, Archives, and Other Information Services	2.0%	2,253	\$124,900	243	469	287	999
6221	General Medical and Surgical Hospitals	1.8%	1,977	\$108,600	230	368	-3	595
5413	Architectural, Engineering, and Related Services	1.7%	1,850	\$119,900	196	349	51	596
6111	Elementary and Secondary Schools	1.5%	1,660	\$89,900	199	327	-52	474
9211	Executive, Legislative, and Other General Government Support	1.5%	1,650	\$104,600	192	314	-14	492
5171	Wired and Wireless Telecommunications (except Satellite)	1.4%	1,606	\$105,300	172	293	-57	407
3341	Computer and Peripheral Equipment Manufacturing	1.4%	1,583	\$152,400	158	298	54	510
5417	Scientific Research and Development Services	1.2%	1,297	\$138,800	140	255	86	480
5242	Agencies, Brokerages, and Other Insurance Related Activities	1.0%	1,097	\$108,700	128	222	78	429
	All Others	24.3%	27,119		3,173	5,473	427	9,074

FEATURED OCCUPATIONS

The following four roles are held by a significant number of Minnesota talent, have high forecasted replacement and new demand needs that are unlikely to be met by local talent supply without changes to the training, education, and recruitment landscape. Focused needs are within the [System Networks Pathway](#) (Computer Systems Analyst) and [Programming and Software Development Pathway](#) (Computer User Support Specialist, Information Security Analyst, and Software Developer).

These four occupations are mapped onto an Origin – Gateway – Target model¹ that places roles according to where they may fall on a career path by volume of jobs, education required, wages, and demand. Origin Occupations (e.g., Computer User Support Specialist) are high volume entry points into a career field, with low wages and no postsecondary degree typically required. Gateway Occupations (e.g., Computer Systems Analyst and Software Developer) are moderate demand steppingstone roles offering mid-range wages that typically require some postsecondary education. Target Occupations (e.g., Software Developer and Information Security Analyst) are generally high demand destination careers with high wages, requiring a postsecondary credential. Note that Software Developer can be considered to be both a Gateway and a Target Occupation.



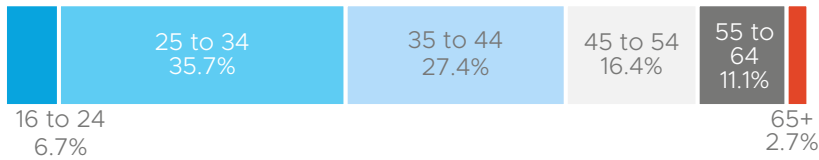
¹ Modeled from the Markle Foundation's Rework America Alliance OGT Model, designed in 2021

Software Developer

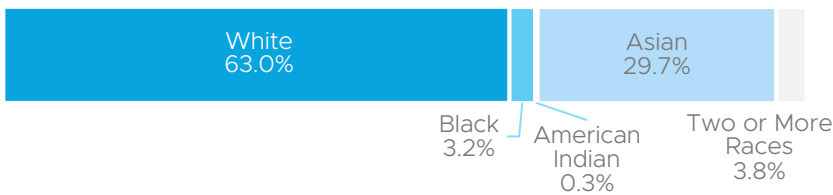
Software Developers research, design, and develop computer and network software or specialized utility programs. Job titles may include Software Engineer, Data Engineer, Software Developer, Devops Engineer, Application Developer, and others.

TALENT SUPPLY DEMOGRAPHICS

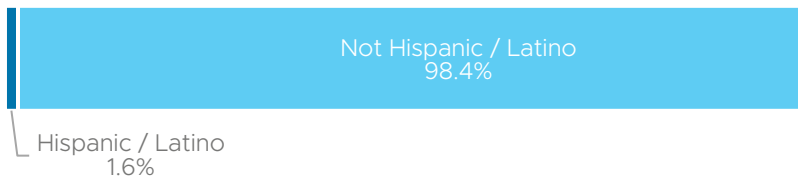
Age



Race



Ethnicity



Gender



Top Job Titles Used by Employers

- Senior Software Engineer
- Software Engineer
- Data Engineer
- Software Developer
- Senior Data Engineer

DEMAND FAST FACTS

35,278

Software Developer Jobs Held by Professionals in Minnesota

31.6%

Of all Tech Occupation Employment

637

Unemployed (1.8% rate)

13,451

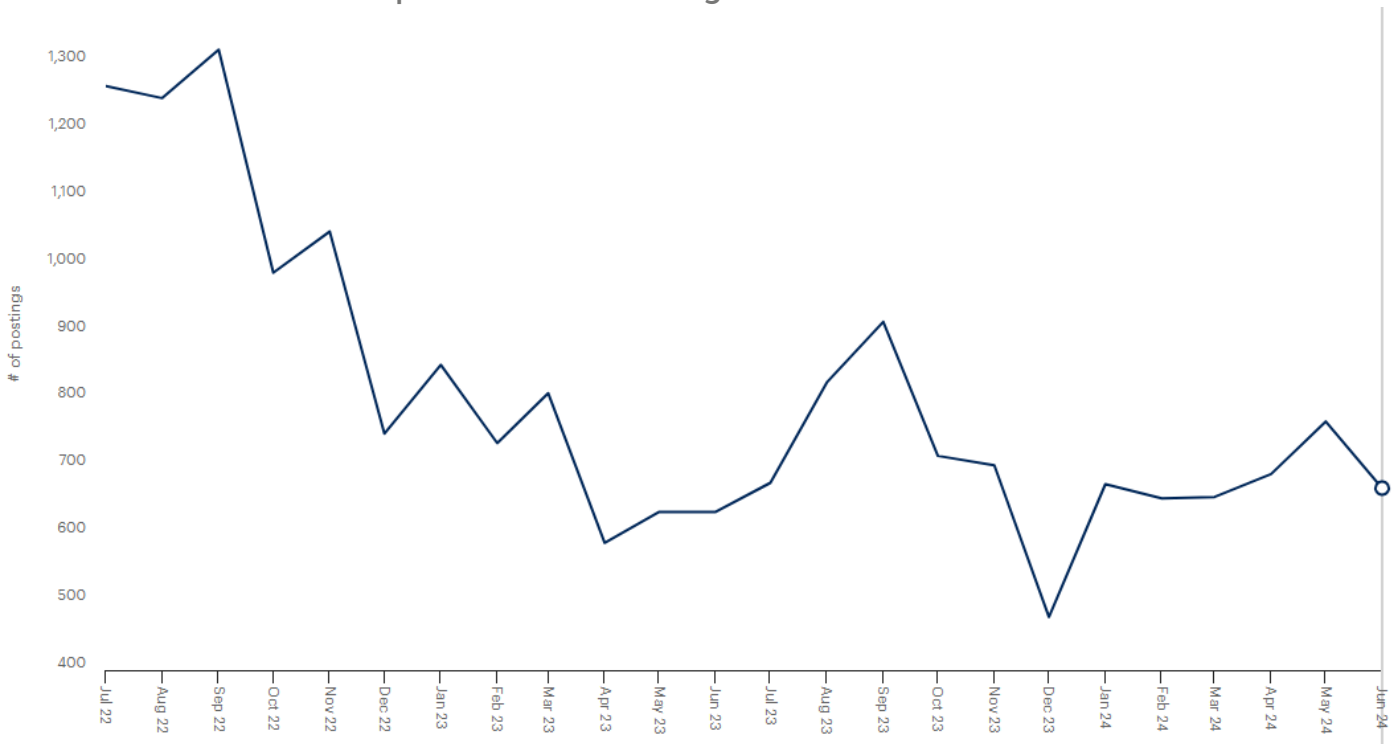
New Software Developers needed in Minnesota by the beginning of 2029

JOB POSTING TRENDS

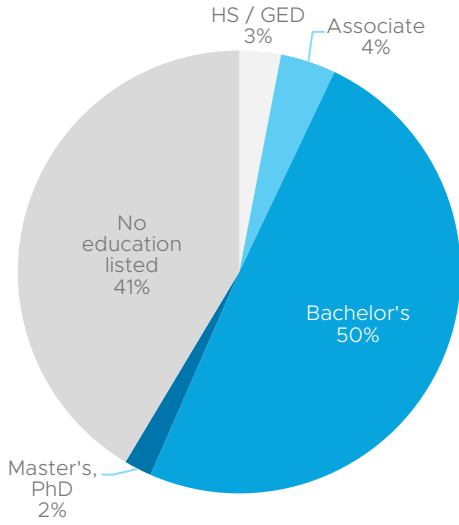
Data in this section focuses on all Software Developer jobs newly advertised between July 1, 2023 and June 30, 2024 across Minnesota. Overall, there were 11,094 new jobs advertised for Software Developers during this time frame, a decrease of 24% from the prior 12-month period.



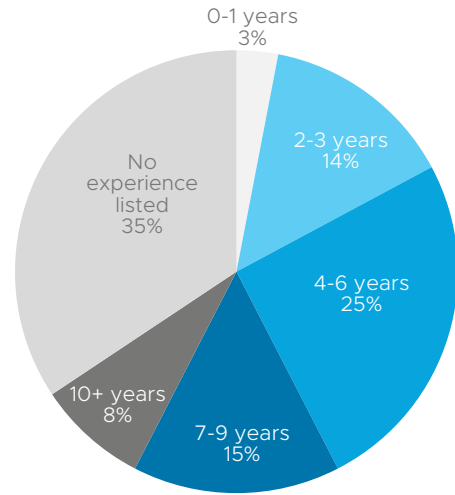
Volume of Software Developer Online Job Postings Jul 2022 to Jun 2024



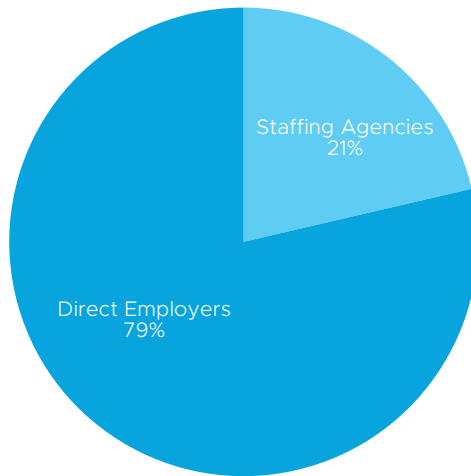
Minimum Education Level Requirements



Minimum Experience Level Requirements



New Job Postings Advertised in Minnesota by Employer Type



Top Employers by Volume of New Job Postings, With Change from Prior Year

Direct Employers Only

Employer	Percent Change
1. Target Corporation	-47%
2. U.S. Bank	-55%
3. C4 Technical Services	41%
4. Leidos	226%
5. Tata Consultancy Services	87%
6. Javen Technologies, Inc.	33%
7. Securian Financial	52%
8. Deloitte	-67%
9. Hewlett Packard Enterprise	51%
10. UnitedHealth Group	-74%

When staffing firms are included in the list of top employers, Randstad, Genesis10, and Diverse Lynx LLC make the top ten employers by volume.

New Job Postings by Industry or Employer Type

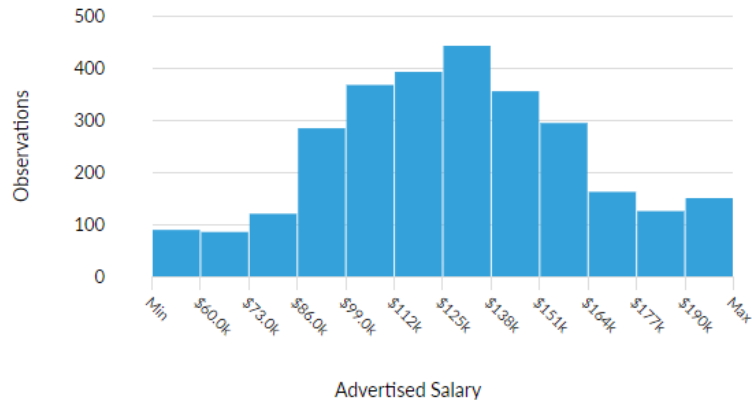
Industry	Total/Unique (Jul 2023 - Jun 2024)	Posting Intensity	Median Posting Duration
Custom Computer Programming Services	1,567 / 866	2 : 1	15 days
Employment Placement Agencies	1,216 / 853	1 : 1	17 days
Computer Systems Design Services	914 / 658	1 : 1	15 days
Commercial Banking	441 / 235	2 : 1	19 days
Other Computer Related Services	316 / 229	1 : 1	11 days
Insurance Agencies and Brokerages	565 / 227	2 : 1	14 days
Temporary Help Services	286 / 208	1 : 1	18 days
Administrative Management and General Management Consulting Services	310 / 186	2 : 1	22 days
Direct Health and Medical Insurance Carriers	413 / 182	2 : 1	21 days
Computing Infrastructure Providers, Data Processing, Web Hosting, and Related Services	328 / 175	2 : 1	21 days

Software Developer Advertised Salary Range

\$126.8K

Median Advertised Salary

This is \$1.5K above the government recorded median salary for Software Developers in Minnesota.



▲ 11.1%

Jul 2021 – Jun 2024

\$125k Median

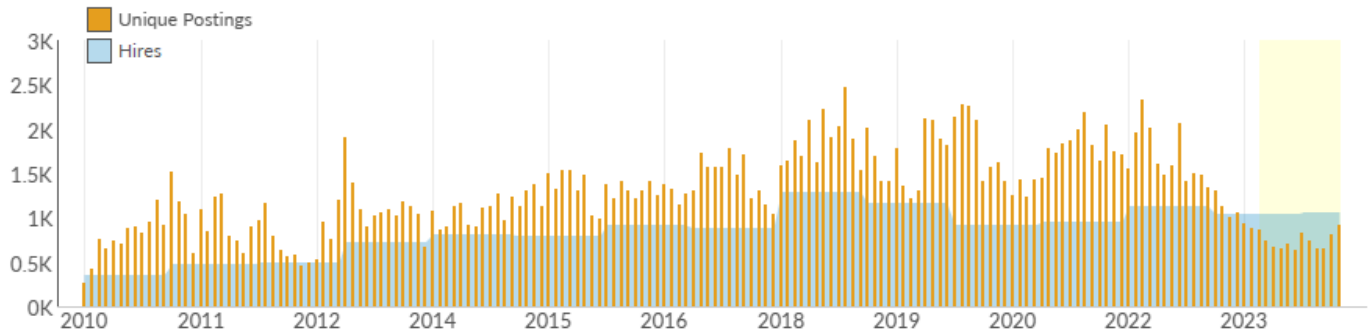
6M 1Y 3Y CUSTOM



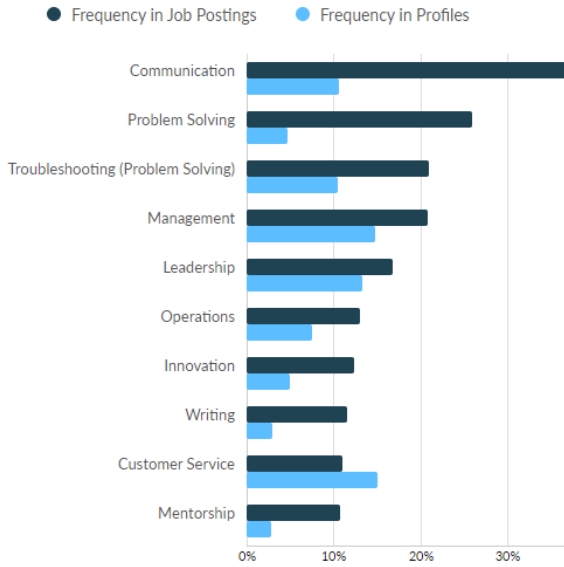
12,002 Job Postings

Monthly Ratio of Unique Job Postings to Estimated Hires

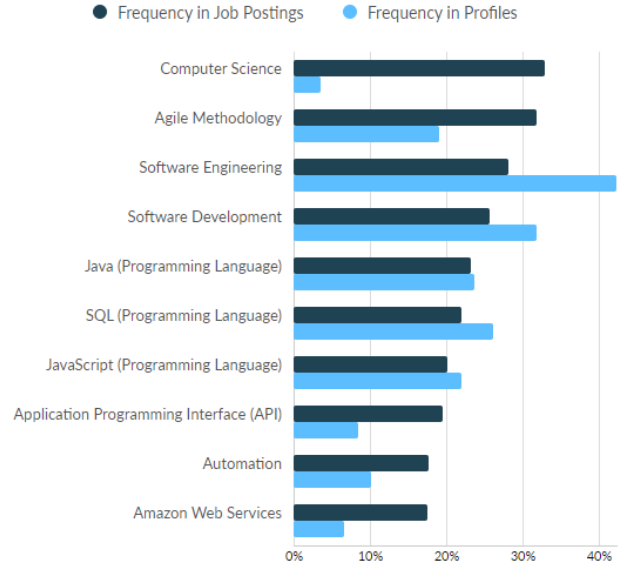
From Jul 2023 – Jun 2024, there were 956 Software Developers hired on average each month. In this same time period, there were 737 newly posted monthly jobs — meaning there was slightly more than one person hired for every job posting. This reverses the trend of more posts than hires seen for the prior decade.



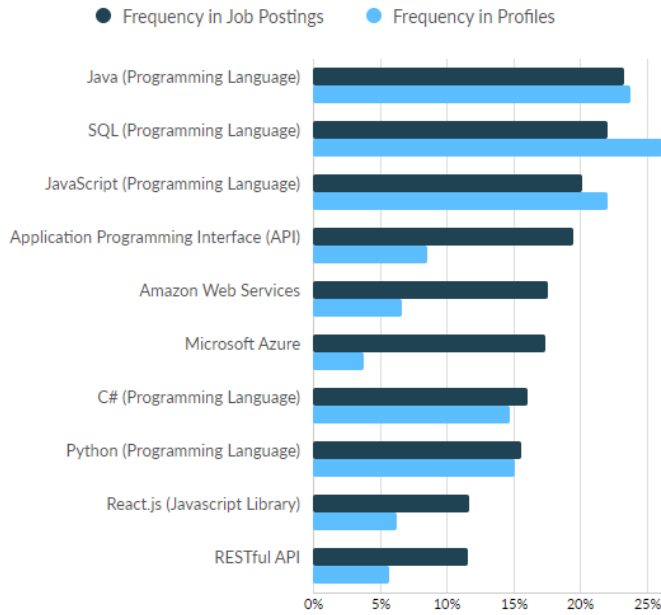
Top Common Skills



Top Specialized Skills



Top Software Skills



Top Certifications and Qualifications

Qualification	Postings with Qualification
Valid Driver's License	125
Security Clearance	97
Salesforce Certification	80
Certified Information Systems Security Professional	55
Functional Skills Qualification	53
Pega Certified Lead System Architect	44
Secret Clearance	42
DO-178B/C (Software Considerations in Airborne Systems and Equipment Certification)	41
Certified Power Quality Professional	37
Microsoft Certified Professional	36

ENTRY LEVEL JOB TITLES IN DEMAND

While very few entry level Software Developer roles are currently being advertised, the following job titles for Software Developers may be most accessible to talent beginning their careers. Of the 8,486 job postings available in Lightcast for Software Developers between July 2023 and June 2024, only 252 can be classified as entry level, requiring 0-2 years of experience and minimum education of Associate degree or less (or no requirement). Even these top job titles for entry level roles tend to have a minority of positions open at an entry level.

Top Entry Level Software Developer Job Titles

Minnesota, Jul 2023 – Jun 2024

Job Title	12 month Posting Volume	Experience Level Requirements	Education Level Requirements	Notable Skills and Credentials	Examples of Employers Recruiting
Software Engineer	756 total 19 entry level	22% 0-3 years 26% none listed	8% Associate or HS 22% none listed	Software Engineering, Software Development, Computer Science, Agile Methodology, C#	Actalent Ranstad Mayo Clinic
Software Developer	248 total 14 entry level	24% 0-3 years 35% none listed	6% Associate or HS 44% none listed	SQL, Computer Science, Agile Methodology, Software Development	Securian Financial Robert Half Pearson Education
DevOps Engineer	186 total 8 entry level	20% 0-3 years 26% none listed	3% Associate or HS 35% none listed	DevOps, CI/CD, Automation, Terraform, Python	Kidiscovery Wipro Randstad
Salesforce Developer	134 total 7 entry level	23% 0-3 years 18% none listed	2% Associate or HS 60% none listed	Salesforce certifications including Administrator, Platform App Builder, B2C Solution Architect, and others; Visualforce, API, Lightning Web Components	Securian Financial Datasite Randstad
Splunk Engineer	18 total 11 entry level	67% 2-3 years 17% none listed	0% Associate or HS 67% none listed	Splunk, Parsing, Security Information and Event Management, Linux, Shell Script	Securian Financial Target Mindpoint Group

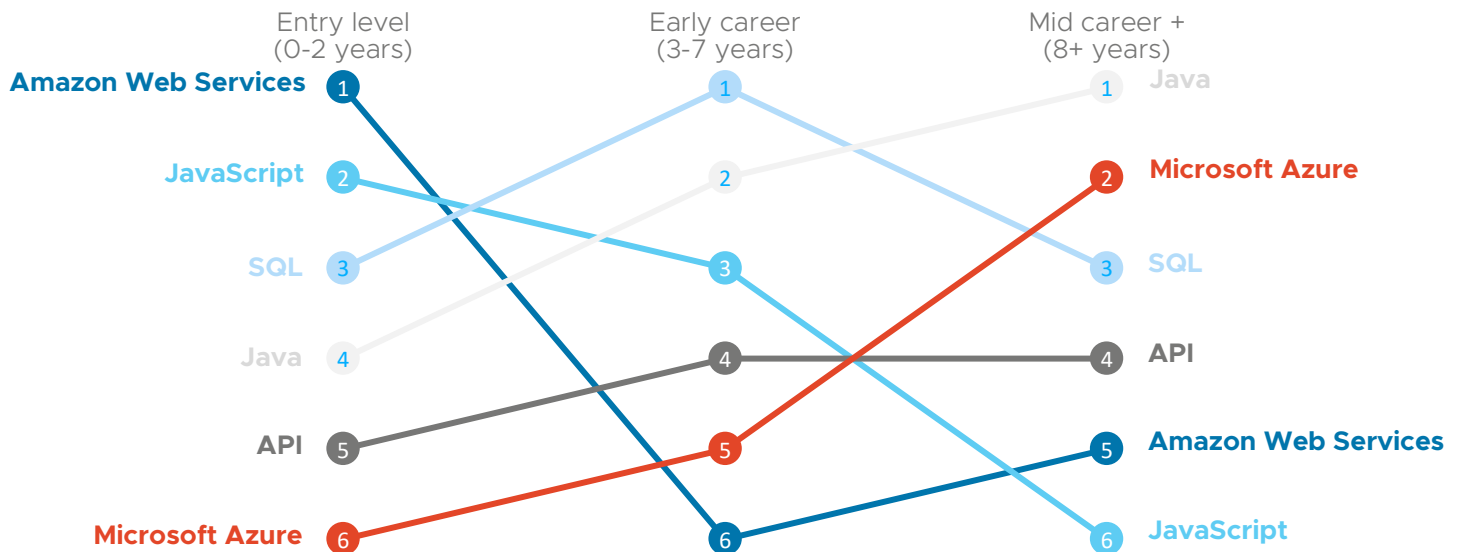
Note: "entry level" postings are those requiring 0-2 years of experience and minimum education of high school/GED, Associate degree, or no requirement listed. Postings that do not list an experience requirement are excluded from this count due to limitations of Lightcast.

CAREER MAPPING

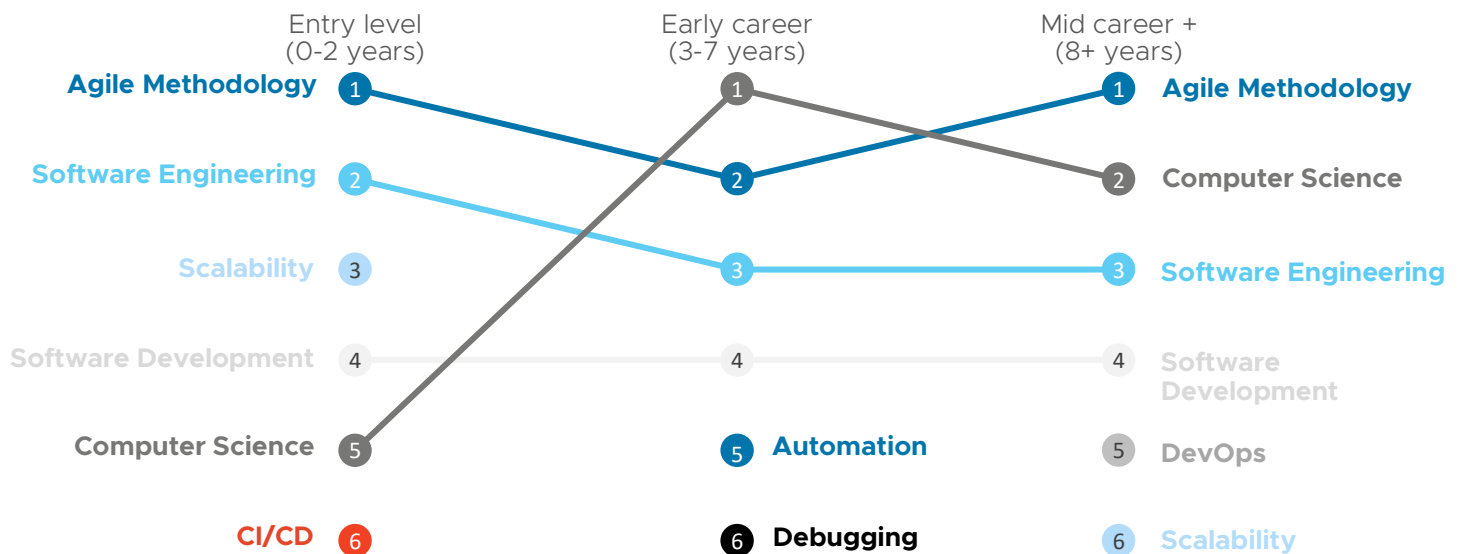
Skill Trends

Amazon Web Services is the top requested software skill in job postings for entry-level Software Developer roles. While this remains important for Software Developers who are later in their careers, Java becomes the top requested software for those with 8+ years of experience.

Top In-Demand Software Skills by Career Stage



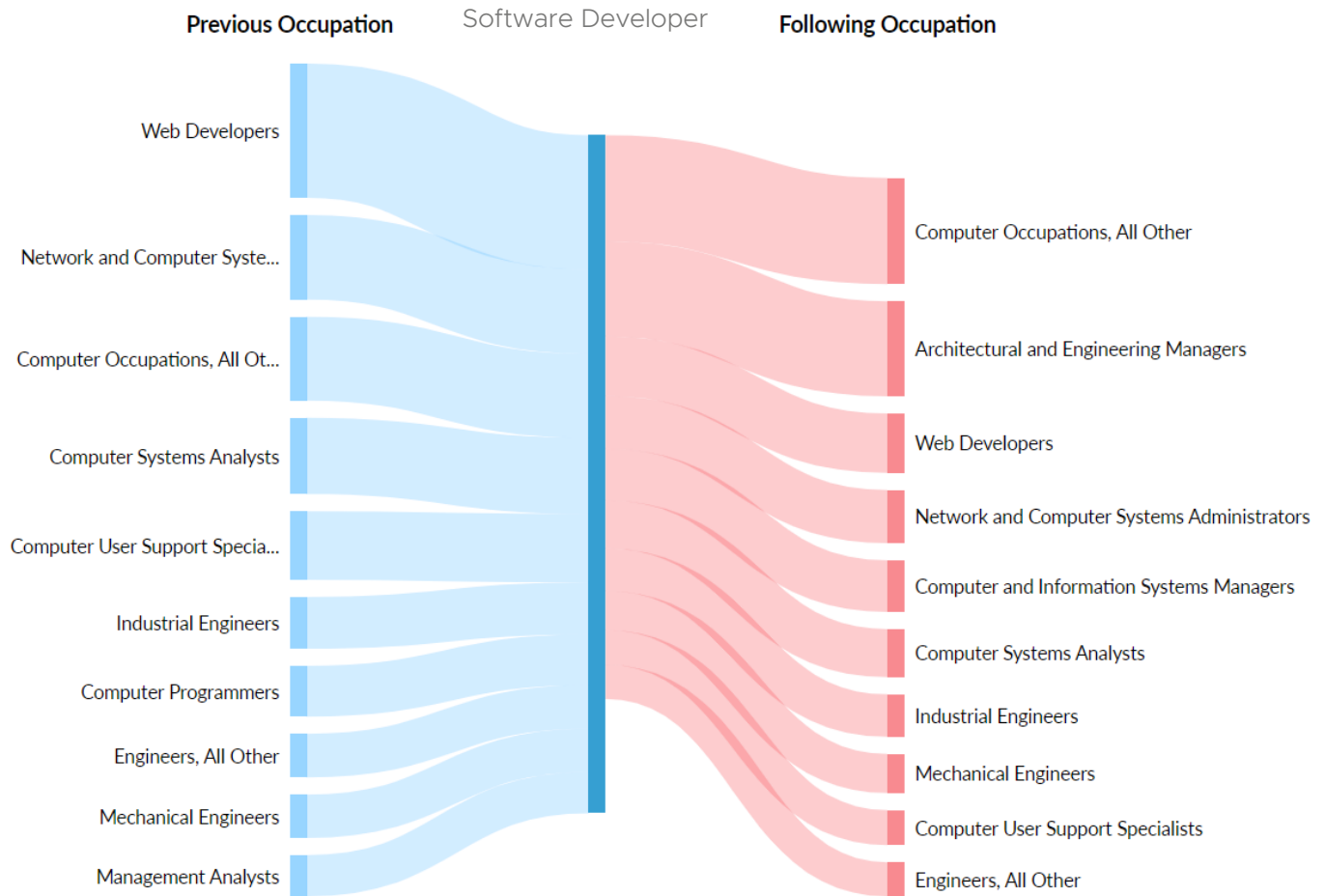
Top In-Demand Other Specialized Skills by Career Stage



Note: "Entry level" reflects job postings requesting 0-2 years of experience and minimum education of high school/GED, Associate degree, or no education mentioned. "Early career" reflects job postings requesting 3-7 years of experience and minimum education of bachelor's degree or lower, or no education mentioned. "Mid career +" reflects job postings requesting 8 or more years of experience and any minimum education level, or no education mentioned.

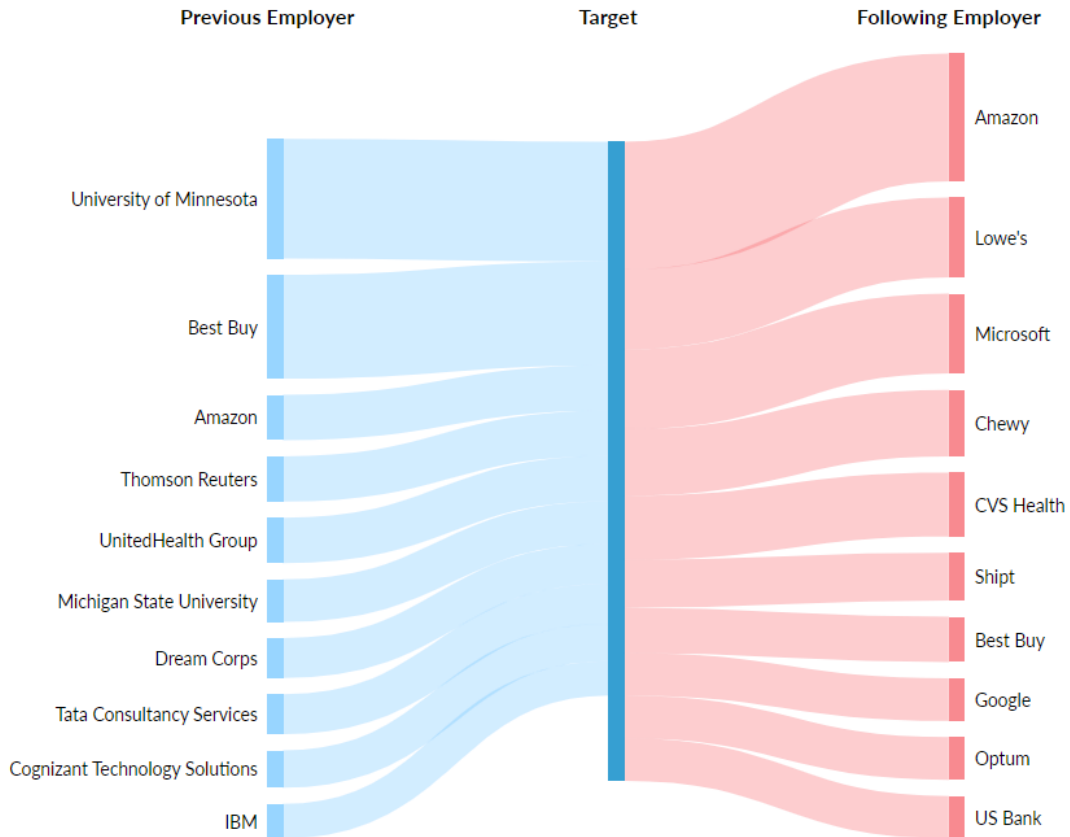
CAREER TRAJECTORIES

Software Developers often move into the role from other tech occupations, most frequently Web Developers, Network and Computer Systems Administrators, All Other Computer Occupations, and Computer Systems Analysts. Those who move on to different occupations most often work next in All Other Computer Occupations or Architectural and Engineering Managers.



COMPANY TRAJECTORIES

Target is the top employer of Software Developer talent in Minnesota by job posting volume. Prior to working for Target, Software Developers most commonly work for The University of Minnesota or Best Buy. After working for Target, workers most often move to Amazon, Lowe's, Microsoft, Chewy, or CVS Health.

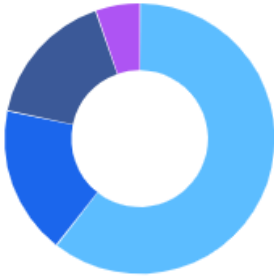


ALIGNED POSTSECONDARY PROGRAMS

There were about 2,528 awards conferred at 49 different accredited Minnesota postsecondary institutions in programs aligned to the Software Developer occupation in SY2023. Among these 286 were at the Associate level, and 182 were certificates that could be earned in less than two years. The average school had about 52 completions, with a range from one to 841 completions. Nearly a third of institutions (31%) offered remote programs.

Software Developer Postsecondary Program Awards by Level, SY2023

CIP Code	Title	Certificate < 1 Yr	Certificate 1+ but < 2 Yr	Associate's	Certificate 2+ but < 4 Yr	Bachelor's	Post-Baccalau- reate	Master's	Doctorate	Total Awards
11.0701	Computer Science	0	0	145	0	1,193	0	134	17	1,489
11.0103	Information Technology	42	0	15	0	225	53	91	7	433
11.0201	Computer Programming/Programmer, General	79	4	90	0	1	0	0	0	174
14.0901	Computer Engineering, General	0	0	0	0	122	0	0	0	122
11.0401	Information Science/Studies	4	2	20	0	76	2	0	0	104
30.7001	Data Science, General	0	0	0	0	40	1	24	0	65
11.0202	Computer Programming, Specific Applications	36	13	5	0	10	0	0	0	64
14.0903	Computer Software Engineering	0	0	11	0	25	0	21	0	57
11.0102	Artificial Intelligence	0	0	0	0	0	14	0	0	14
11.0902	Cloud Computing	0	0	0	0	3	0	0	0	3
11.0804	Modeling, Virtual Environments and Simulation	2	0	0	0	0	0	0	0	2
11.0104	Informatics	0	0	0	0	1	0	0	0	1
11.0204	Computer Game Programming	0	0	0	0	0	0	0	0	0
30.0801	Mathematics and Computer Science	0	0	0	0	0	0	0	0	0
	Total	163	19	286	0	1,696	70	270	24	2,528



Institution Type	Completions (2023)	Market Share
Public, 4-year or above	1,529	60.5%
Public, 2-year	449	17.8%
Private not-for-profit, 4-year or above	415	16.4%
Private for-profit, 4-year or above	135	5.3%

Over half (60.5%) of SY2023 awards were conferred at public four-year institutions, with University of Minnesota, Twin Cities having the largest number of completions in SY2023, followed by Metropolitan State University, comprising 33% and 9% respectively of related awards conferred. Completions are up overall by 14% from 2019.

Software Developer Postsecondary Program Awards by Institution, SY2023

Institution	Completions (2023)	Growth % YOY (2023)	Market Share (2023) [?]	IPEDS Tuition & Fees (2022)	Completions Trend (2019-2023)
⊕ University of Minnesota-Twin Cities	841	13.6%	33.3%	\$15,859	
⊕ Metropolitan State University	231	-9.1%	9.1%	\$9,684	
⊕ University of St Thomas	152	-15.1%	6.0%	\$50,366	
⊕ Minnesota State University-Mankato	137	-0.7%	5.4%	\$9,444	
⊕ Capella University	108	-22.3%	4.3%	\$14,328	
⊕ Minneapolis Community and Technical College	107	11.5%	4.2%	\$6,098	
⊕ North Hennepin Community College	99	-29.3%	3.9%	\$5,050	
⊕ Saint Cloud State University	93	20.8%	3.7%	\$10,117	
⊕ University of Minnesota-Duluth	78	-3.7%	3.1%	\$14,126	
⊕ Winona State University	71	20.3%	2.8%	\$10,492	

GRADUATE DEMOGRAPHICS

Postsecondary program diversity varies by program. Computer science programs have the largest number of international students (219 or 16%), and most programs have an overrepresentation of male students. SY2022 is the most recent data available for graduate demographics.

Race and Gender of Graduates Receiving Postsecondary Awards in SY2022, Minnesota

CIP Code	Description	All 2022 Graduates	International Student*	Black or African Am., non-Hispanic	Am. Indian or Alaska Native	Asian, Native Hawaiian or Other Pacific Islander	Hispanic or Latino	White, non-Hispanic	Multiple or unknown race/ethnicity	Gender Males	Gender Females
11.0701	Computer Science	1,364	219	81	1	229	52	698	84	1,100	264
11.0103	Information Technology	468	109	54	3	57	22	181	42	327	141
11.0201	Computer Programming/ Programmer, General	220	16	38	0	38	14	108	6	167	53
11.0401	Information Science/Studies	119	5	29	0	15	8	53	9	99	20
14.0901	Computer Engineering, General	98	18	7	0	8	4	56	5	84	14
11.0202	Computer Programming, Specific Applications	88	4	7	0	10	10	45	12	67	21
14.0903	Computer Software Engineering	66	17	4	0	5	2	33	5	57	9
30.7001	Data Science, General	55	24	8	0	2	2	16	3	34	21
11.0102	Artificial Intelligence	9	0	1	0	1	0	3	4	5	4
11.0902	Cloud Computing	7	0	2	0	1	0	2	2	3	4
11.0104	Informatics	4	0	1	0	1	0	2	0	1	3
30.0801	Mathematics and Computer Science	2	1	0	0	0	1	0	0	2	0
11.0204	Computer Game Programming	0	0	0	0	0	0	0	0	0	0
11.0804	Modeling, Virtual Environments and Simulation	0	0	0	0	0	0	0	0	0	0
	All Software Developer Postsecondary Programs	2,500	413	232	4	367	115	1,197	172	1,946	554

IPEDS SY2022 demographics by award conferred. Count of awards may double count individuals who obtained multiple credentials in the same calendar year.

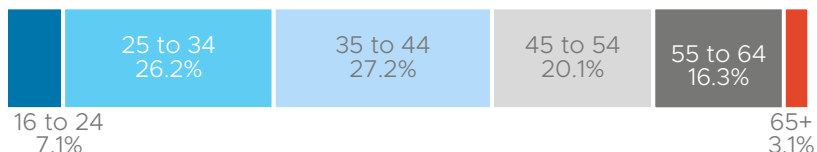
*NCES IPEDS refers to international students that do not have resident status in the United States as "nonresident aliens." This title aligns to Federal tax definitions and according to NCES IPEDS refers to "a person who is not a citizen or national of the United States and who is in this country on a visa or temporary basis and does not have the right to remain indefinitely. Note: Nonresident aliens are reported separately, rather than in any of the racial/ethnic categories." They are not included in calculations of BIPOC talent in this report as race and ethnicity information is not provided for these international students. The terminology of "international student" has been used in this report as it is more familiar to a common audience. <https://nces.ed.gov/ipeds/report-your-data/race-ethnicity-definitions>. For more information, view this article from Berkeley on tax filing status of international students. <https://internationaloffice.berkeley.edu/taxes/tax-filing-status>

Computer User Support Specialist

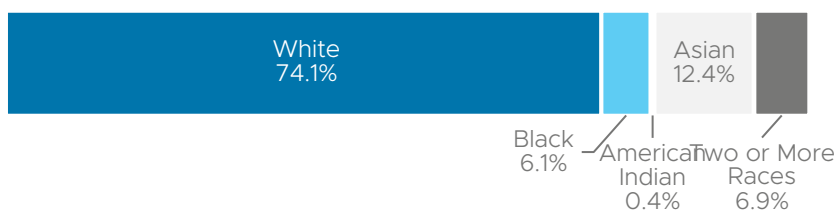
Computer User Support Specialists provide technical assistance to computer users. This assistance may concern the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems. Job titles may include Computer Support Specialist, Computer Technician, Desktop Support Technician, Help Desk Analyst, Help Desk Technician, and others.

TALENT SUPPLY DEMOGRAPHICS

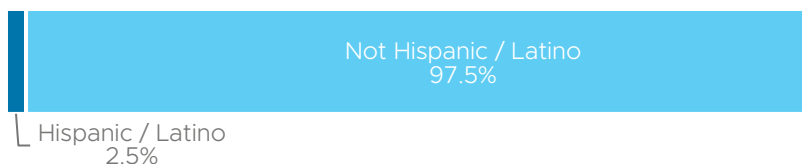
Age



Race



Ethnicity



Gender



Top Job Titles Used by Employers

- IT Specialists
- Technical Support Specialists
- IT Support Specialists
- Help Desk Technicians
- Help Desk Analysts

Demand Fast Facts

13,500

Computer User Support Specialist Jobs Held by Professionals in Minnesota

12.1%

Of all Tech Occupation Employment

197

Unemployed (1.4% rate)

4,431

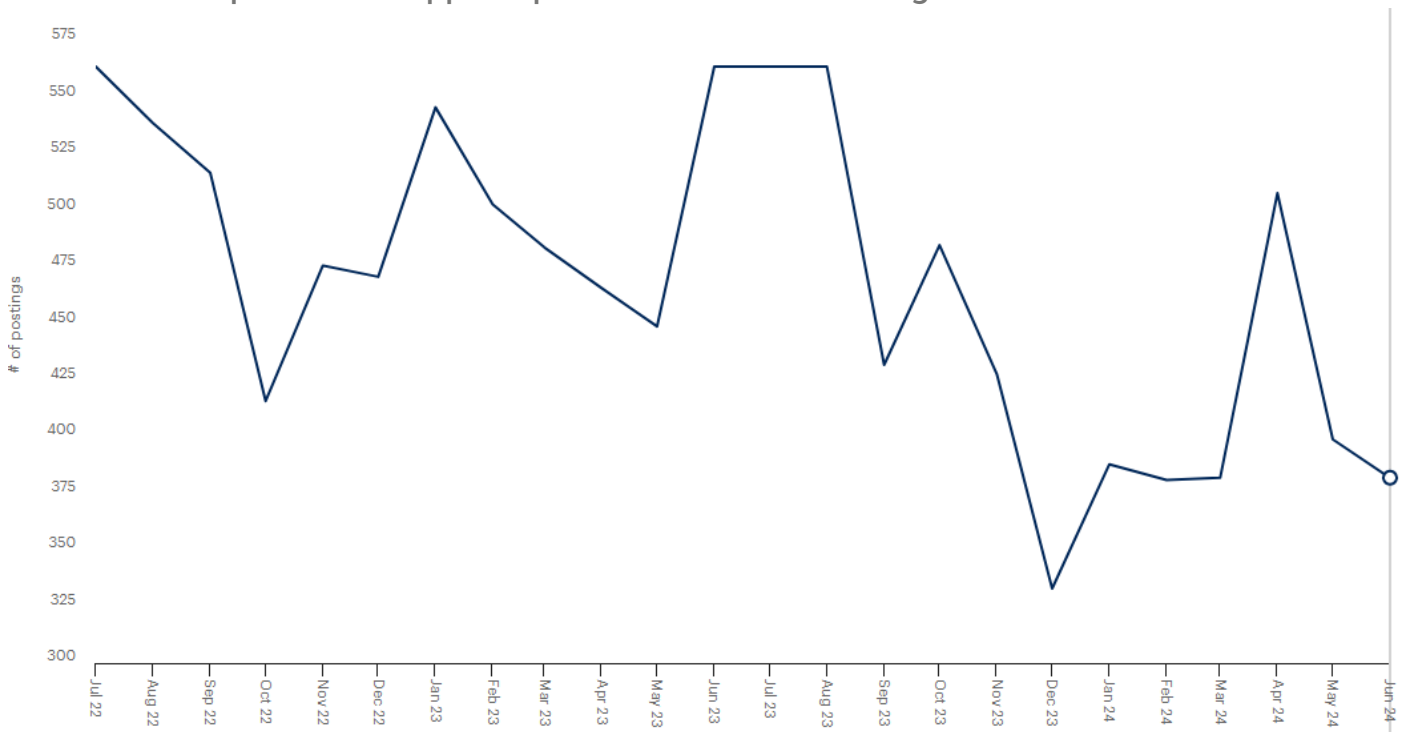
New Computer User Support Specialists needed in Minnesota by the beginning of 2029

JOB POSTING TRENDS

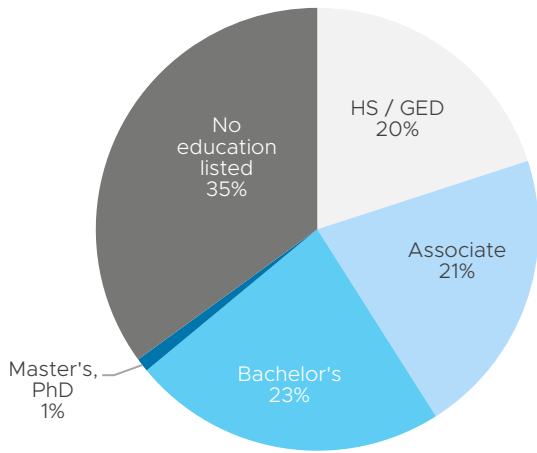
Data in this section focuses on all Computer User Support Specialist jobs newly advertised between July 1, 2023 and June 30, 2024 across Minnesota. Overall, there were 5,263 new jobs advertised for Computer User Support Specialists during this time frame, a decrease of 12% from the prior 12-month period.



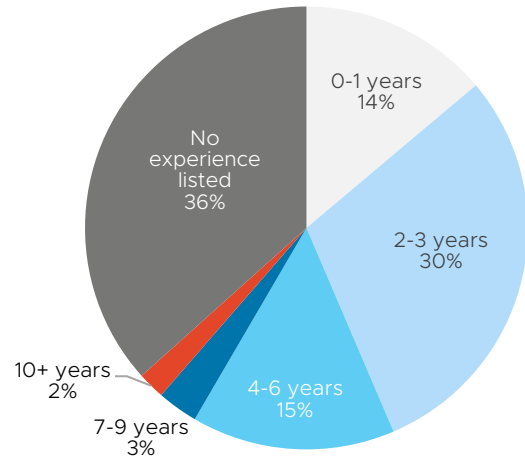
Volume of Computer User Support Specialist Online Job Postings Jul 2022 to Jun 2024



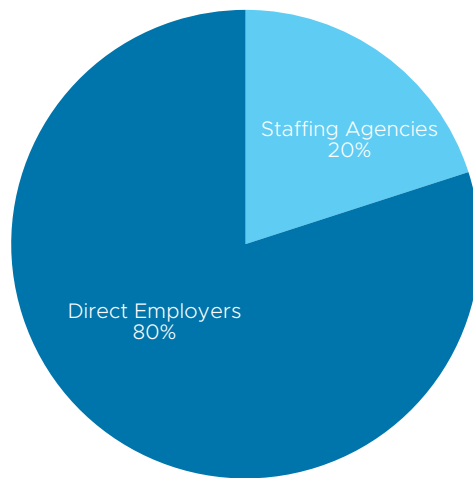
Minimum Education Level Requirements



Minimum Experience Level Requirements



New Job Postings Advertised in Minnesota by Employer Type



Top Employers by Volume of New Job Postings, With Change from Prior Year

Direct Employers only

Employer	Percent Change
1. Army	49%
2. University Of Minnesota	93%
3. State of Minnesota	321%
4. Unitedhealth Group	-50%
5. Hennepin County	86%
6. DataSite	300%
7. Osseo Area Schools	84%
8. Honeywell	39%
9. Spectrum	3100%
10. Minnesota Department of Human Services	0%

When staffing firms are included in the list of top employers, three of the top ten employers are staffing firms: TEKsystems, Robert Half International, and Dahl Consulting.

New Job Postings by Industry or Employer Type

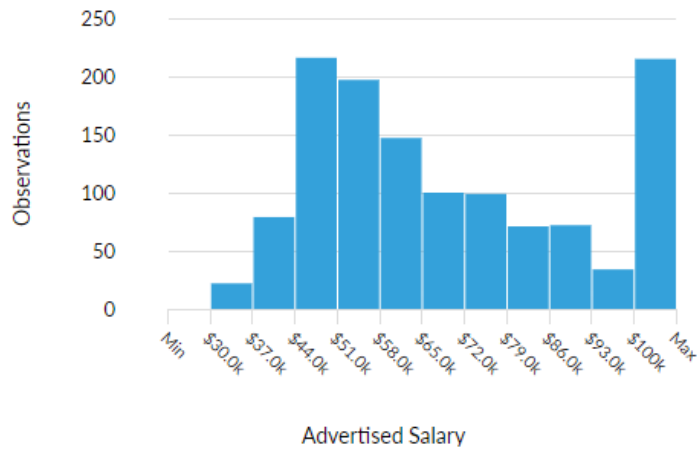
Industry	Total/Unique (Jul 2023 - Jun 2024)	Posting Intensity	Median Posting Duration
Temporary Help Services	493 / 226	2 : 1	18 days
Other General Government Support	280 / 157	2 : 1	21 days
Employment Placement Agencies	251 / 156	2 : 1	17 days
Custom Computer Programming Services	224 / 143	2 : 1	21 days
Human Resources Consulting Services	146 / 114	1 : 1	12 days
Other Computer Related Services	242 / 113	2 : 1	27 days
General Medical and Surgical Hospitals	330 / 100	3 : 1	26 days
Computer Systems Design Services	110 / 75	1 : 1	22 days
Colleges, Universities, and Professional Schools	136 / 53	3 : 1	21 days
Electronics and Appliance Retailers	105 / 49	2 : 1	26 days

Computer User Support Specialist Advertised Salary Range

\$62.6K

Median Advertised Salary

This is \$166.8 below the government recorded median salary for Computer User Support Specialists in Minnesota.



▲ 43.0% Jul 2021 – Jun 2024
\$56.2k Median

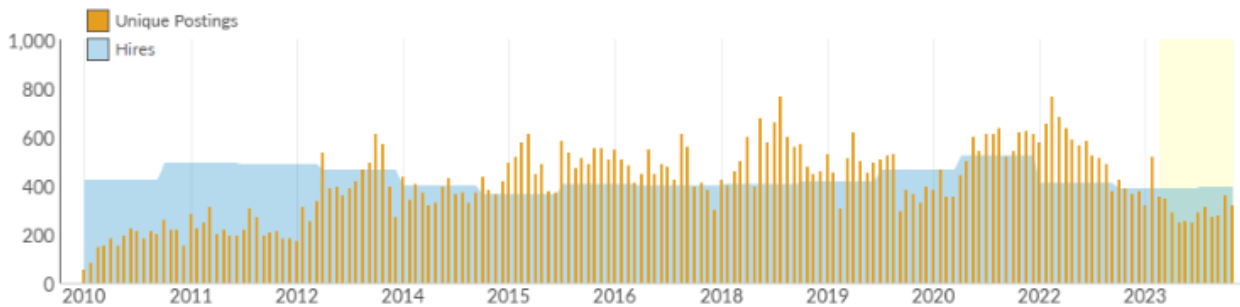
6M 1Y 3Y CUSTOM



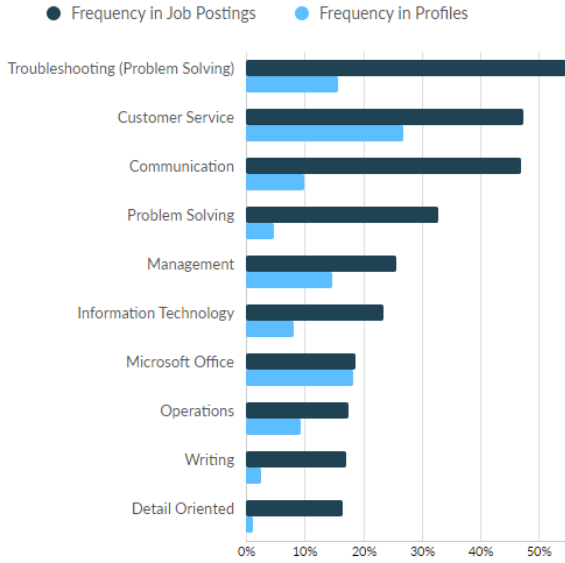
4,995 Job Postings

Monthly Ratio of Unique Job Postings to Estimated Hires

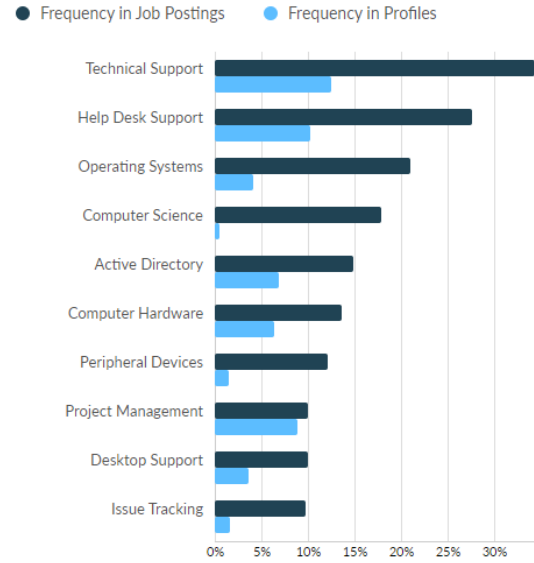
From Jul 2023 – Jun 2024, there were 390 Computer User Support Specialists hired on average each month. In this same time period, there were 297 newly posted monthly jobs — meaning there was slightly more than one person hired for every job posting.



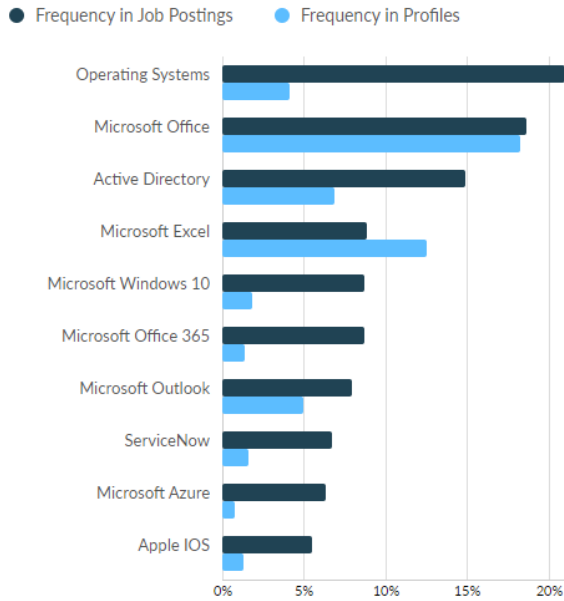
Top Common Skills



Top Specialized Skills



Top Software Skills



Top Certifications and Qualifications

Qualification	Postings with Qualification
CompTIA A+	337
Valid Driver's License	296
Microsoft Certified Professional	97
CompTIA Network+	95
ITIL Foundation Certification	73
Cisco Certified Network Associate	57
CompTIA Certification	38
Microsoft Certified Systems Engineer	35
ITIL Certifications	27
CompTIA Security+	25

ENTRY LEVEL JOB TITLES IN DEMAND

The following job titles are used for Computer User Support Specialists that may be most accessible to talent beginning their careers. Of the 3,568 job postings available in Lightcast for Computer User Support Specialists between July 2023 and June 2024, 910 can be classified as entry level, requiring 0-2 years of experience and minimum education of Associate degree or less (or no requirement). Overall, the Computer User Support Specialist role may be much more accessible to entry level talent than other IT occupations.

Top Entry Level Computer User Support Specialist Job Titles

Minnesota, Jul 2023 – Jun 2024

Job Title	12 month Posting Volume	Experience Level Requirements	Education Level Requirements	Notable Skills and Credentials	Examples of Employers Recruiting
Technical Support Specialists	97 total 28 entry level	46% 0-3 years 33% none listed	68% Associate or HS 21% none listed	Technical Support, Call Center Experience, Microsoft Office, CompTIA A+	Legrand Av Osseo Area Schools Carrier Corporation
IT Support Specialists	95 total 26 entry level	51% 0-3 years 36% none listed	53% Associate or HS 36% none listed	Help Desk Support, Technical Support, Active Directory, Computer Hardware, Operating Systems, CompTIA A+, CompTIA Network+	US Bank Bethel University Allegis Group
Help Desk Technicians	92 total 43 entry level	52% 0-3 years 41% none listed	58% Associate or HS 32% none listed	Help Desk Support, Technical Support, Computer Hardware, Email Software, Web Browsers, CompTIA A+	Arvig Enterprises TTEC Ledgent
Workstation Technicians	36 total 32 entry level	92% 0-3 years 6% none listed	98% Associate or HS 3% none listed	Operating Systems, Hardware Configuration Management, Software Installation, Inventory Control Systems, End User Training and Support	Computer Task Group CTG ASGN
PC Technicians	36 total 25 entry level	72% 2-3 years 28% none listed	9% Associate or HS 92% none listed	Local Area Networks, Computer Hardware, Dynamic Host Configuration Protocol, TCP/IP, Wide Area Networks, CompTIA A+	Robert Half TEK Systems Allegis Group

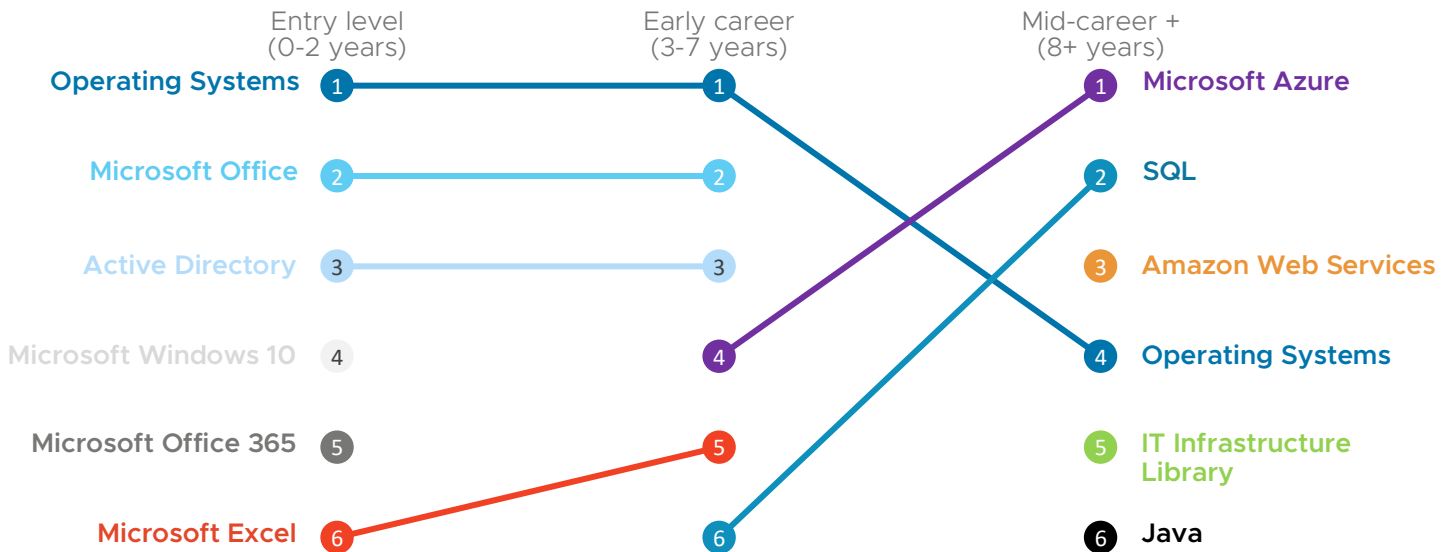
Note: "entry level" postings are those requiring 0-2 years of experience and minimum education of high school/GED, Associate degree, or no requirement listed. Postings that do not list an experience requirement are excluded from this count due to limitations of Lightcast.

CAREER MAPPING

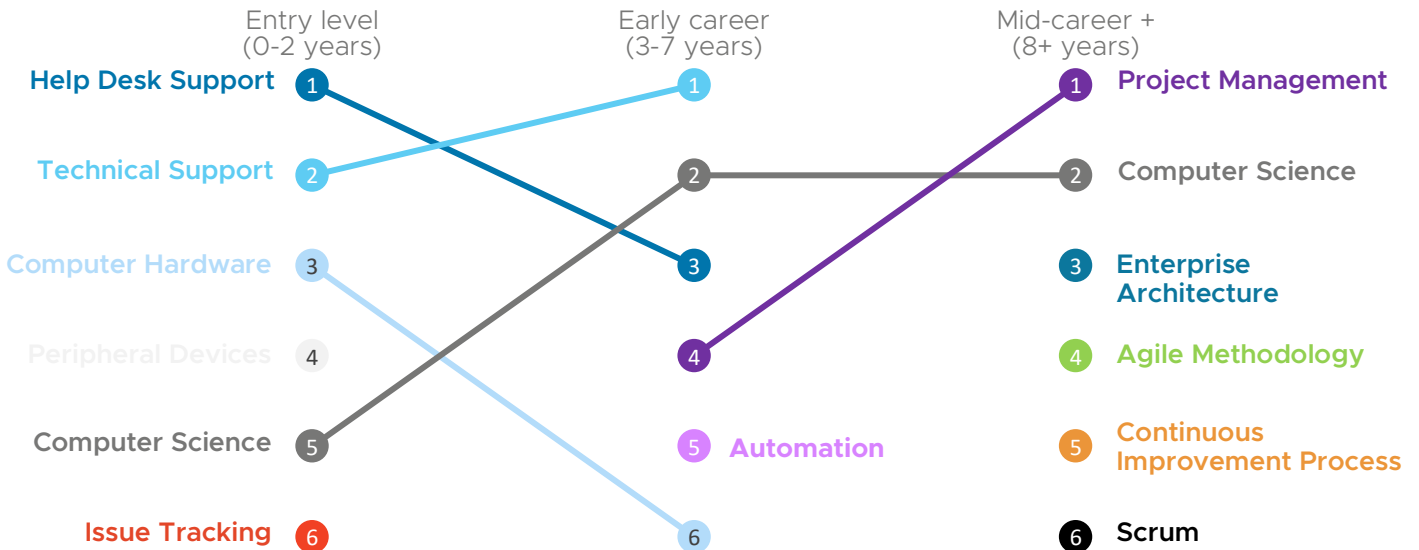
Skill Trends

In-demand skills change almost entirely between Entry Level and Mid-Career for Computer User Support Specialist roles. While the top requested skills for Entry Level talent are Operating Systems and Help Desk Support, for Mid-Career professionals, most requested are Microsoft Azure and Project Management skills.

Top In-Demand Software Skills by Career Stage



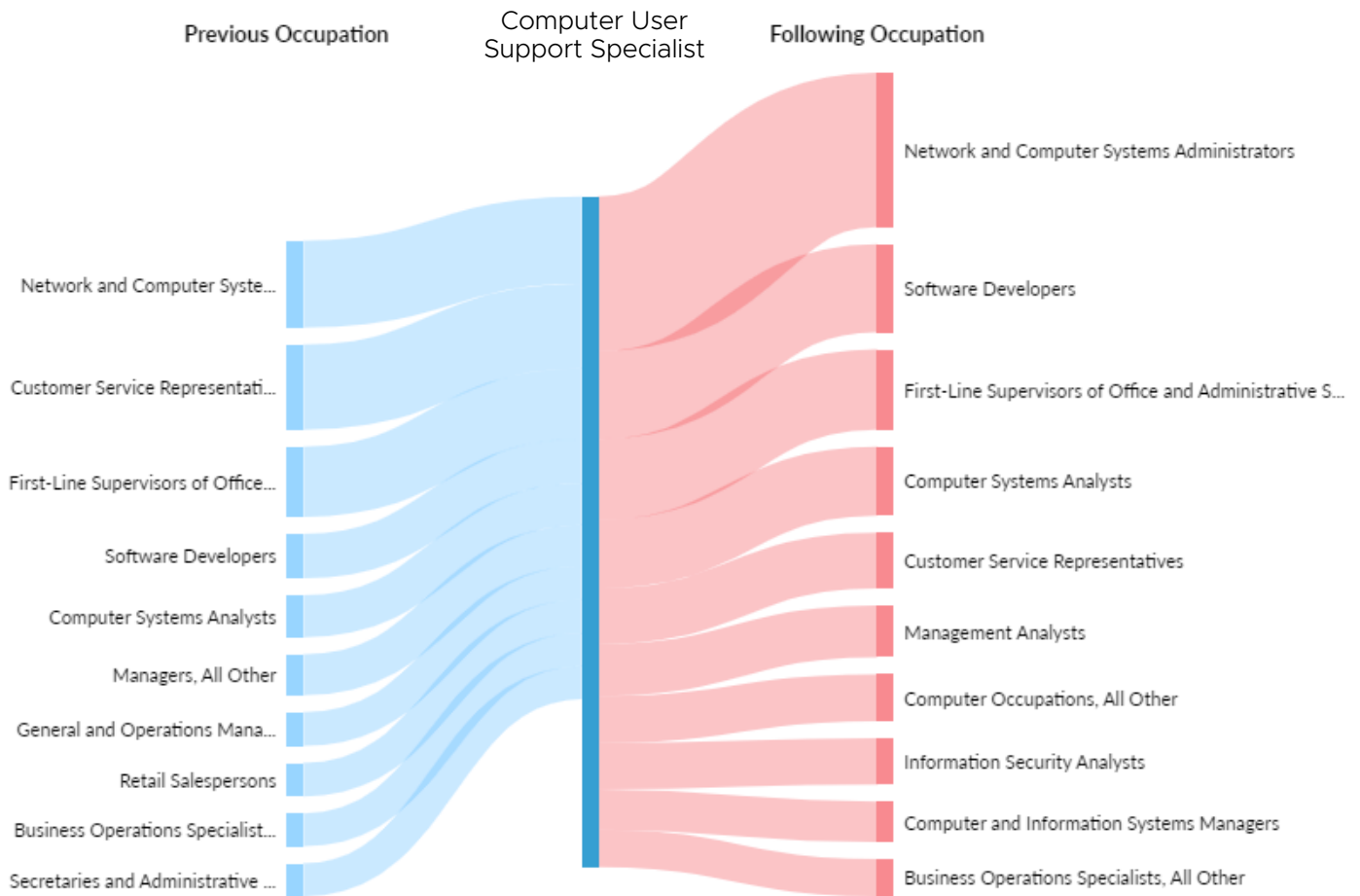
Top In-Demand Other Specialized Skills by Career Stage



Note: "Entry level" reflects job postings requesting 0-2 years of experience and minimum education of high school/GED, Associate degree, or no education mentioned. "Early career" reflects job postings requesting 3-7 years of experience and minimum education of bachelor's degree or lower, or no education mentioned. "Mid career +" reflects job postings requesting 8 or more years of experience and any minimum education level, or no education mentioned.

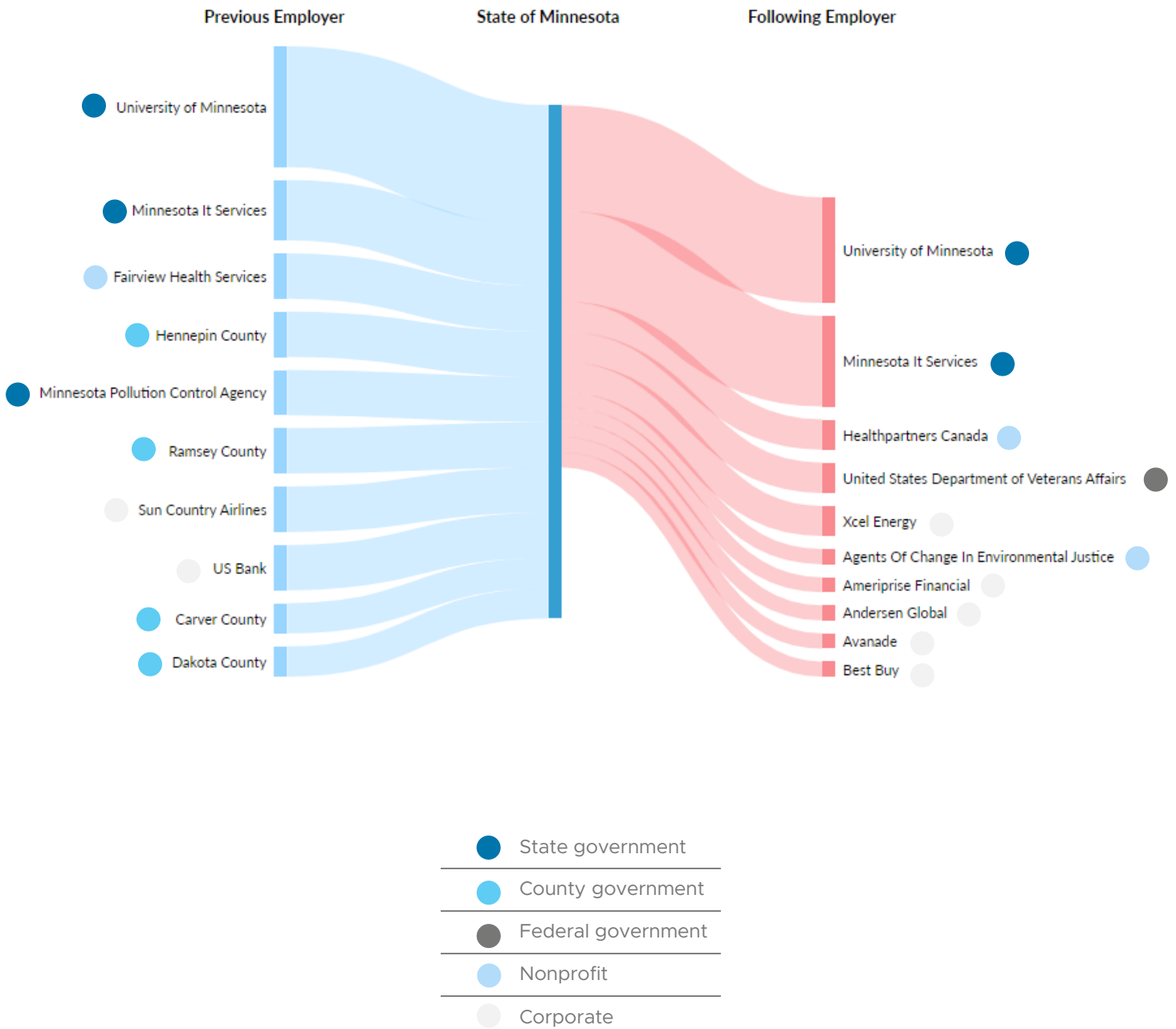
CAREER TRAJECTORIES

Computer User Support Specialists move into the role from a mix of other occupations, including IT roles (e.g., Network and Computer Systems Administrators and Computer Systems Analysts), customer service roles (e.g., Customer Service Representatives, Retail Salespersons), and supervisor/manager roles (e.g., First-Line Supervisors of Office and Administrative Support Workers, All Other Managers). Those who move on to different occupations most often work next as Network and Computer Systems Administrators. Many also switch to other IT, supervisor/manager, or business roles.



COMPANY TRAJECTORIES

The State of Minnesota is one of the top employers of Computer User Support Specialist talent by job posting volume. The State draws heavily from the University of Minnesota as well as other state and county government entities. Fewer Computer User Support Specialists transition out of the State of Minnesota than transition in, implying that once they begin work for the State, some may stay for the remainder of their careers. Those that do move to other employers most often work for the University of Minnesota or other state or federal government. A significant portion also move on to nonprofits or corporate employers.



ALIGNED POSTSECONDARY PROGRAMS

There were about 520 awards conferred at 20 different Minnesota postsecondary institutions in programs aligned to the Computer User Support Specialist occupation in SY2023. Among, these 31 were at the Associate level, and 311 were certificates that could be earned in less than two years. The average school had about 23 completions, with a range from one to 178 completions. A minority of institutions (17%) offered remote programs.

Computer User Support Specialist Postsecondary Program Awards by Level, SY2023

CIP Code	Title	Certificate < 1 Yr	Certificate 1+ but < 2 Yr	Associate's	Certificate 2+ but < 4 Yr	Bachelor's	Post- Baccalau- reate	Master's	Doctorate	Total Awards
11.0101	Computer and Information Sciences, General	190	0	0	0	95	7	55	9	356
11.1006	Computer Support Specialist	55	17	24	0	0	0	0	0	96
11.0202	Computer Programming, Specific Applications	36	13	5	0	10	0	0	0	64
11.0199	Computer and Information Sciences, Other	0	0	0	0	0	0	0	2	2
51.0709	Medical Office Computer Specialist/Assistant	0	0	2	0	0	0	0	0	2
01.0106	Agricultural Business Technology/Technician	0	0	0	0	0	0	0	0	0
	Total	281	30	31	0	105	7	55	11	520



Institution Type	Completions (2023)	Market Share
Private not-for-profit, less-than-2-year	178	34.2%
Public, 2-year	160	30.8%
Private for-profit, 4-year or above	108	20.8%
Private not-for-profit, 4-year or above	74	14.2%

About a third (34.2%) of SY2023 awards were conferred at an institution that is private, not-for-profit, and less-than-2-years — with all those completions occurring at Summit Academy OIC. Walden University had the next highest number of awards, with 18% of SY2023 awards. Completions are up overall by 32% from 2019.

Computer User Support Specialist Postsecondary Program Awards by Institution, SY2023

Institution	Completions (2023)	Growth % YOY (2023)	Market Share (2023)	IPEDS Tuition & Fees (2022)	Completions Trend (2019-2023)
Summit Academy Opportunities Industrialization Center	178	-7.8%	34.2%	N/A	
Walden University	92	-30.3%	17.7%	\$11,047	
Anoka Technical College	50	-40.5%	9.6%	\$6,075	
Macalester College	50	-13.8%	9.6%	\$62,500	
Minneapolis Community and Technical College	39	-2.5%	7.5%	\$6,098	
Hennepin Technical College	34	-19.0%	6.5%	\$5,881	
The College of Saint Scholastica	14	-41.7%	2.7%	\$39,410	
Capella University	12	-52.0%	2.3%	\$14,328	
South Central College	10	-23.1%	1.9%	\$6,146	
Bethel University	9	-47.1%	1.7%	\$41,270	

GRADUATE DEMOGRAPHICS

Postsecondary program diversity varies by program. General Computer and Information Sciences programs have the largest number of international students, and most programs have an overrepresentation of male students. SY2022 is the most recent data available for graduate demographics.

Race and Gender of Graduates Receiving Postsecondary Awards in SY2022, Minnesota

CIP Code	Description	All 2022 Graduates	International Student*	Black or African Am., non-Hispanic	Am. Indian or Alaska Native	Asian, Native Hawaiian or Other Pacific Islander	Hispanic or Latino	White, non-Hispanic	Multiple or unknown race/ethnicity	Gender Males	Gender Females
11.0101	Computer and Information Sciences, General	454	39	135	7	53	26	119	75	314	140
11.1006	Computer Support Specialist	111	0	10	1	12	12	70	6	95	16
11.0202	Computer Programming, Specific Applications	88	4	7	0	10	10	45	12	67	21
51.0709	Medical Office Computer Specialist/Assistant	3	0	2	0	0	0	1	0	1	2
01.0106	Agricultural Business Technology/Technician	1	0	0	0	0	0	1	0	0	1
11.0199	Computer and Information Sciences, Other	1	0	1	0	0	0	0	0	0	1
	All Computer User Support Specialist Postsecondary Programs	658	43	155	8	75	48	236	93	477	181

IPEDS SY2022 demographics by award conferred. Count of awards may double count individuals who obtained multiple credentials in the same calendar year.

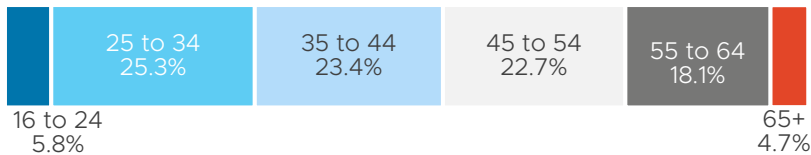
*NCES IPEDS refers to international students that do not have resident status in the United States as "nonresident aliens." This title aligns to Federal tax definitions and according to NCES IPEDS refers to "a person who is not a citizen or national of the United States and who is in this country on a visa or temporary basis and does not have the right to remain indefinitely. Note: Nonresident aliens are reported separately, rather than in any of the racial/ethnic categories." They are not included in calculations of BIPOC talent in this report as race and ethnicity information is not provided for these international students. The terminology of "international student" has been used in this report as it is more familiar to a common audience. <https://nces.ed.gov/ipeds/report-your-data/race-ethnicity-definitions>. For more information, view this article from Berkeley on tax filing status of international students. <https://internationaloffice.berkeley.edu/taxes/tax-filing-status>

Computer Systems Analyst

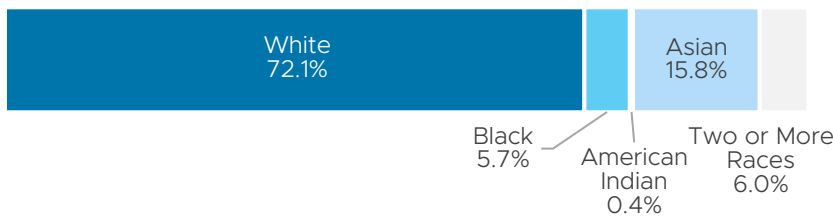
Computer Systems Analysts develop and implement solutions to complex applications problems, system administration issues, or network concerns. They perform systems management and integration functions, improve existing computer systems, and review computer system capabilities. Job titles may include Applications Analyst, Business Systems Analyst, Computer Analyst, Computer Systems Analyst, and others.

TALENT SUPPLY DEMOGRAPHICS

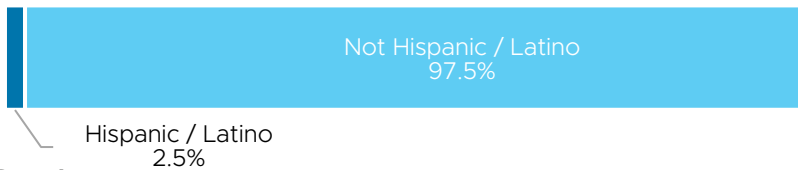
Age



Race



Ethnicity



Gender



Top Job Titles Used by Employers

- Business Systems Analyst
- Business Analyst
- Information Technology Business Analyst
- Senior Business Systems Analyst
- Data Analyst

DEMAND FAST FACTS

12,482

Computer Systems Analyst Jobs Held by Professionals in Minnesota

11.2%

Of all Tech Occupation Employment

144

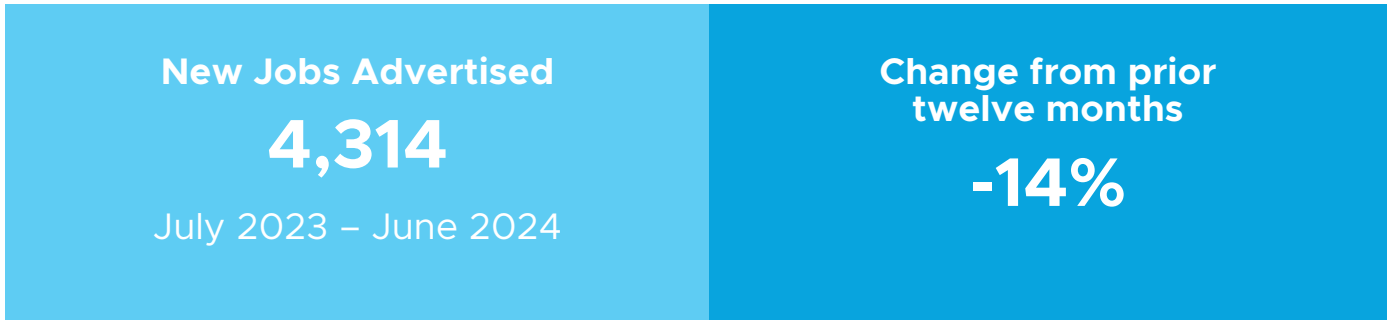
Unemployed (1.2% rate)

3,096

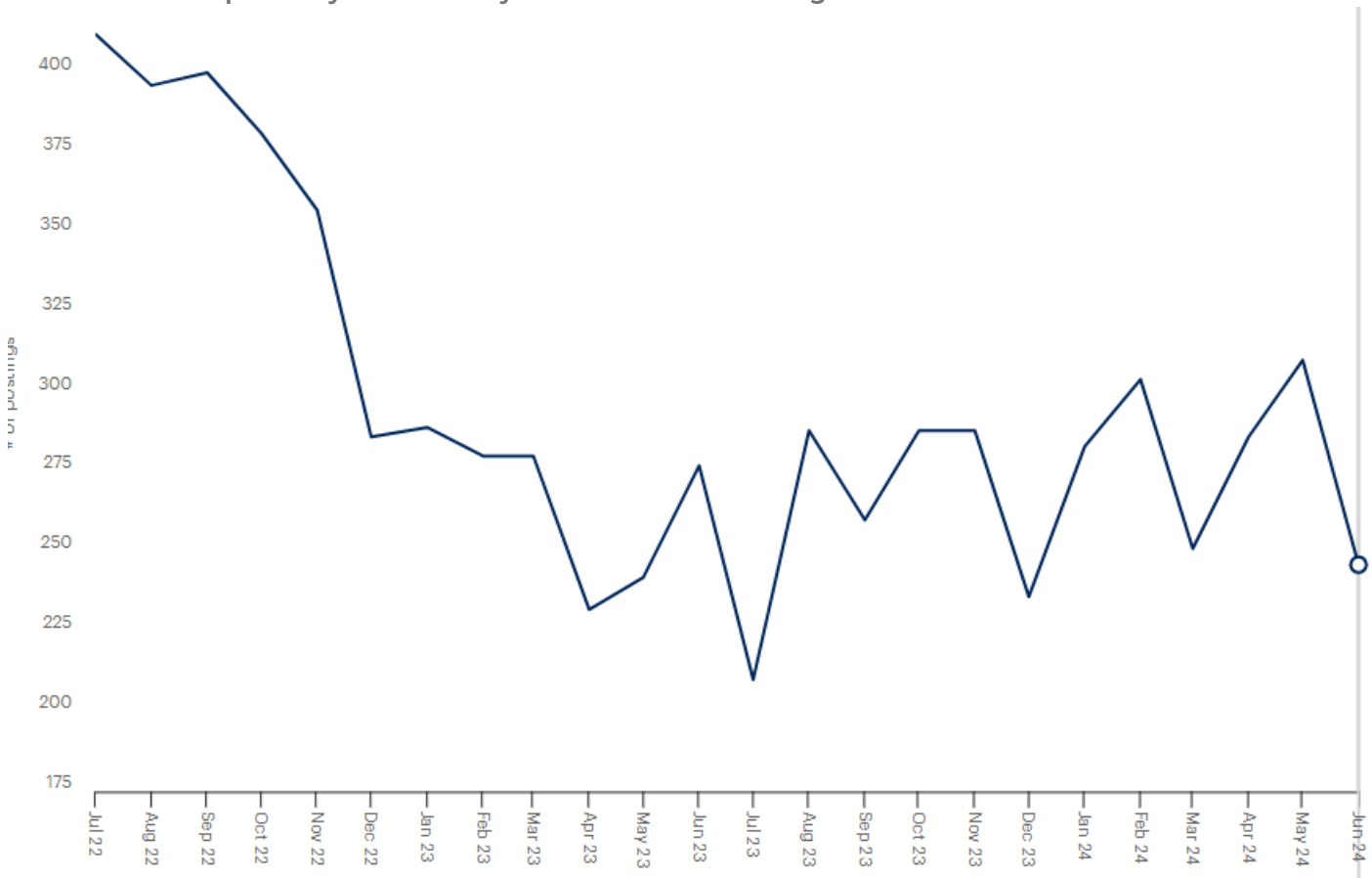
New Computer Systems Analysts needed in Minnesota by the beginning of 2029

JOB POSTING TRENDS

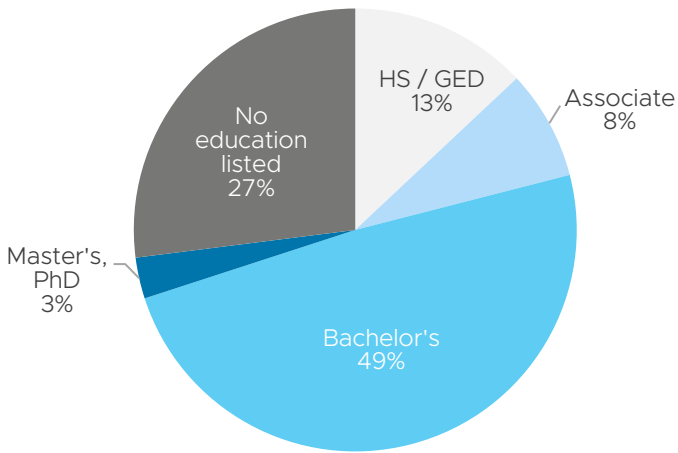
Data in this section focuses on jobs newly advertised between July 1, 2023 and June 30, 2024 across Minnesota. Overall, there were 4,314 new jobs advertised for Computer Systems Analysts during this time frame, a decrease of 14% from the prior 12-month period.



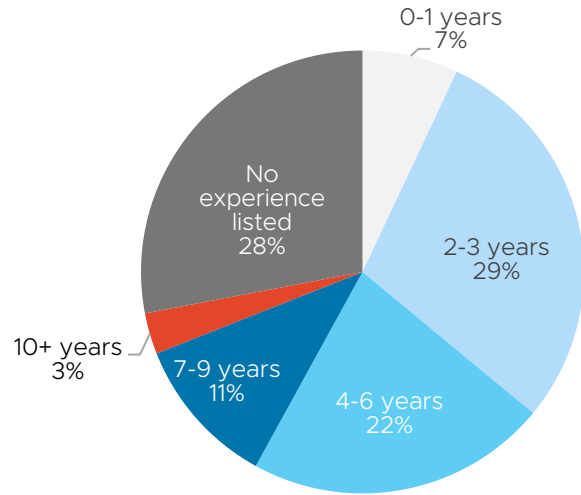
Volume of Computer Systems Analysts Online Job Postings Jul 2022 to Jun 2024



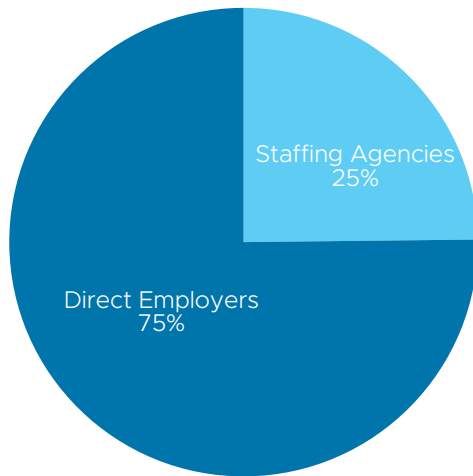
Minimum Education Level Requirements



Minimum Experience Level Requirements



New Job Postings Advertised in Minnesota by Employer Type



Top Employers by Volume of New Job Postings, With Change from Prior Year

Direct Employers only

Employer	Percent Change
1. Unitedhealth Group	-58%
2. Deloitte	-38%
3. Optum	500%
4. ACCENTURE	-22%
5. University Of Minnesota	80%
6. OptumInsight	New entrant
7. State of Minnesota	400%
8. Mayo Clinic	-39%
9. C4 Technical Services	118%
10. PricewaterhouseCoopers	2%

When staffing firms are included in the list of top employers, Genesis10 is the number one employer of Computer Systems Analyst talent.

New Job Postings by Industry or Employer Type

Industry	Total/Unique (Jul 2023 - Jun 2024)	Posting Intensity	Median Posting Duration
Employment Placement Agencies	257 / 176	1 : 1	18 days
Direct Health and Medical Insurance Carriers	326 / 167	2 : 1	17 days
General Medical and Surgical Hospitals	236 / 86	3 : 1	25 days
Computer Systems Design Services	121 / 85	1 : 1	13 days
Custom Computer Programming Services	126 / 84	2 : 1	22 days
Other General Government Support	90 / 68	1 : 1	22 days
Administrative Management and General Management Consulting Services	69 / 52	1 : 1	19 days
Temporary Help Services	64 / 48	1 : 1	17 days
Colleges, Universities, and Professional Schools	104 / 33	3 : 1	22 days
Nursing Care Facilities (Skilled Nursing Facilities)	46 / 29	2 : 1	25 days

Computer Systems Analyst Advertised Salary Range

\$95.0K

Median Advertised Salary

This is \$12.0K below the government recorded median salary for Computer Systems Analysts in Minnesota.



▲ **4.5%** Aug 2021 - Jul 2024
 \$92.5k Median

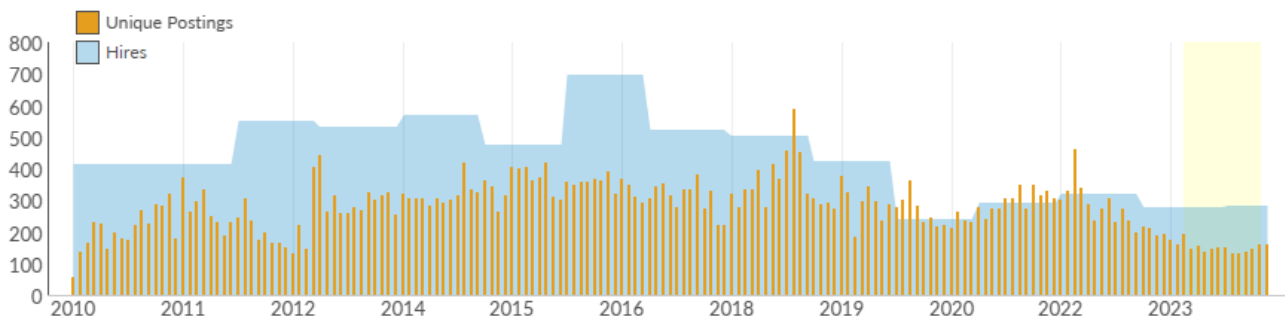
6M 1Y 3Y CUSTOM



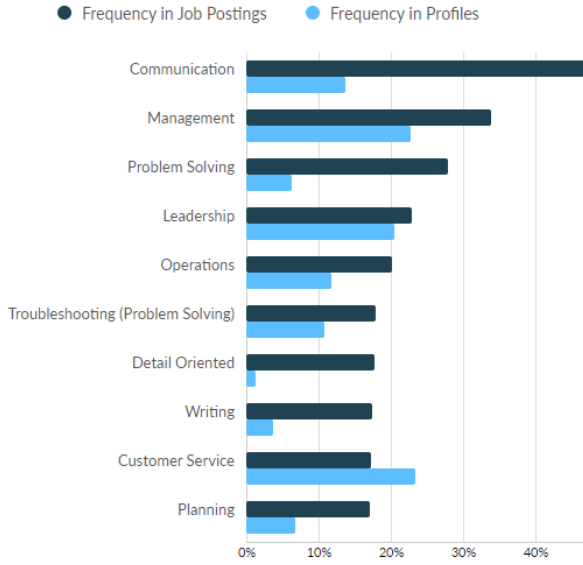
2,441 Job Postings

Monthly Ratio of Unique Job Postings to Estimated Hires

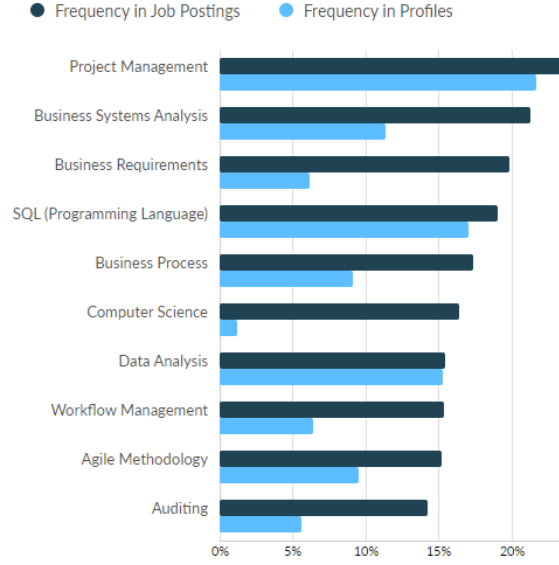
From Jul 2023 – Jun 2024, there were 282 Computer Systems Analysts hired on average each month. In this same time period, there were 149 newly posted monthly jobs — meaning there were about two people hired for every job posting.



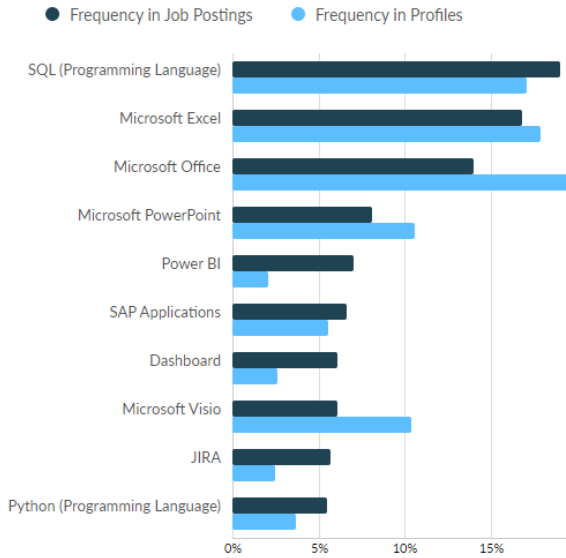
Top Common Skills



Top Specialized Skills



Top Software Skills



Top Certifications and Qualifications

Qualification	Postings with Qualification
Registered Nurse (RN)	70
Registered Health Information Technician (RHIT)	49
Valid Driver's License	42
Registered Health Information Administrator (RHIA)	36
Certified Coding Specialist (CCS)	25
Security Clearance	23
Release of Information (ROI)	21
Certified Professional Coder (CPC)	21
Project Management Professional Certification	18
Certified Business Analysis Professional	16

ENTRY LEVEL JOB TITLES IN DEMAND

The following job titles are used for Computer Systems Analysts that may be most accessible to talent beginning their careers. Of the 1,785 job postings available in Lightcast for Computer Systems Analysts between July 2023 and June 2024, only 168 can be classified as entry level, requiring 0-2 years of experience and minimum education of Associate degree or less (or no requirement).

Top Entry Level Computer Systems Analyst Job Titles

Minnesota, Jul 2023 – Jun 2024

Job Title	12 month Posting Volume	Experience Level Requirements	Education Level Requirements	Notable Skills and Credentials	Examples of Employers Recruiting
Business Systems Analysts	282 total 11 entry level	29% 0-3 years 20% none listed	11% Associate or HS 19% none listed	Business Systems Analysis, Business Requirements, Business Process, SQL, Certified Business Analysis Professional	Genesis10 UnitedHealth Group Ameriprise Financial
Configuration Analysts	65 total 8 entry level	31% 0-3 years 17% none listed	46% Associate or HS 20% none listed	Configuration Management, Auditing, Data Management, Bill of Materials, Microsoft Office	UnitedHealth Group Northrop Grumman UCare
Systems Analysts	58 total 5 entry level	29% 0-3 years 22% none listed	16% Associate or HS 34% none listed	Systems Analysis, Project Management, SQL, Technical Support, Computer Science	Thomson Reuters Mayo Clinic Schwan's Company
Configuration Technicians	8 total 5 entry level	63% 0-3 years 13% none listed	100% Associate or HS 0% none listed	Warehousing, Networking Hardware, Local Area Networks, Microsoft Operating Systems, Peripheral Devices, Microsoft Certified Professional, Cisco Certified Network Associate	Bailliwick iTech Solutions Benchmark Electronics

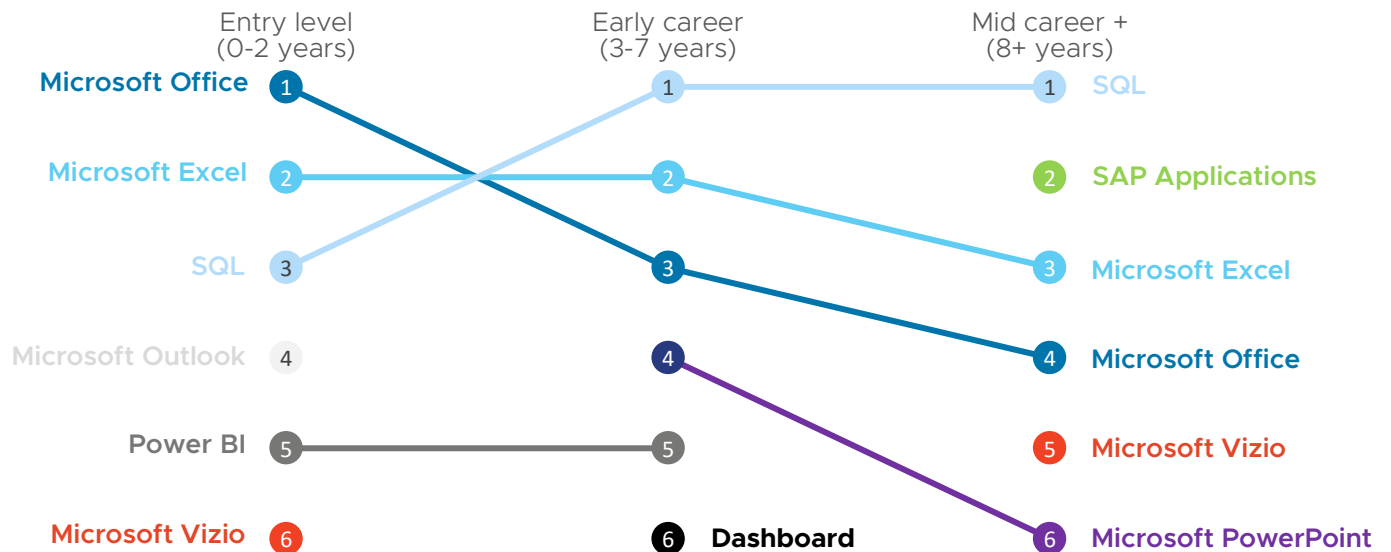
Note: "entry level" postings are those requiring 0-2 years of experience and minimum education of high school/GED, Associate degree, or no requirement listed. Postings that do not list an experience requirement are excluded from this count due to limitations of Lightcast.

CAREER MAPPING

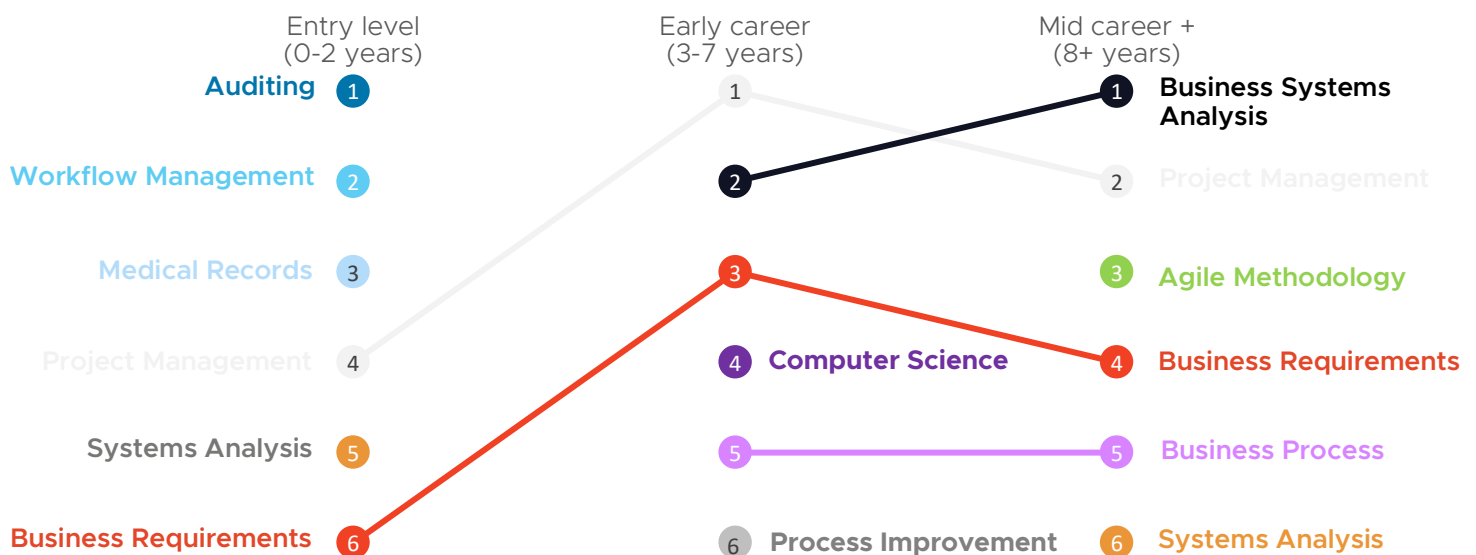
Skill Trends

Microsoft Office, Excel, and SQL are important at all stages of Computer Systems Analyst careers. Whereas Auditing and Workflow Management are sought after in entry level roles, they are replaced by Business Systems Analysis and Project Management as the top specialized skills in more senior roles.

Top In-Demand Software Skills by Career Stage



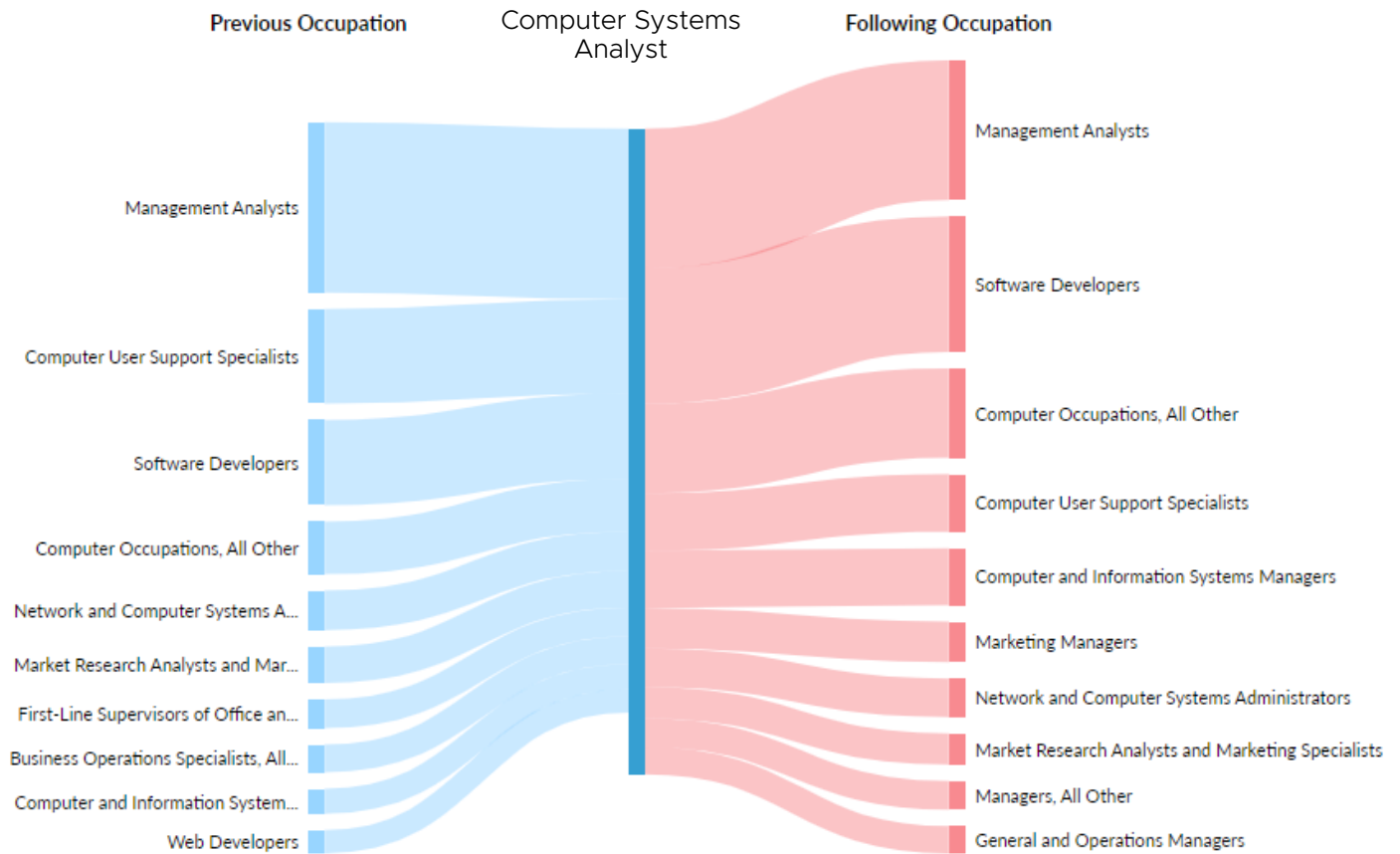
Top In-Demand Other Specialized Skills by Career Stage



Note: "Entry level" reflects job postings requesting 0-2 years of experience and minimum education of high school/GED, Associate degree, or no education mentioned. "Early career" reflects job postings requesting 3-7 years of experience and minimum education of bachelor's degree or lower, or no education mentioned. "Mid career +" reflects job postings requesting 8 or more years of experience and any minimum education level, or no education mentioned.

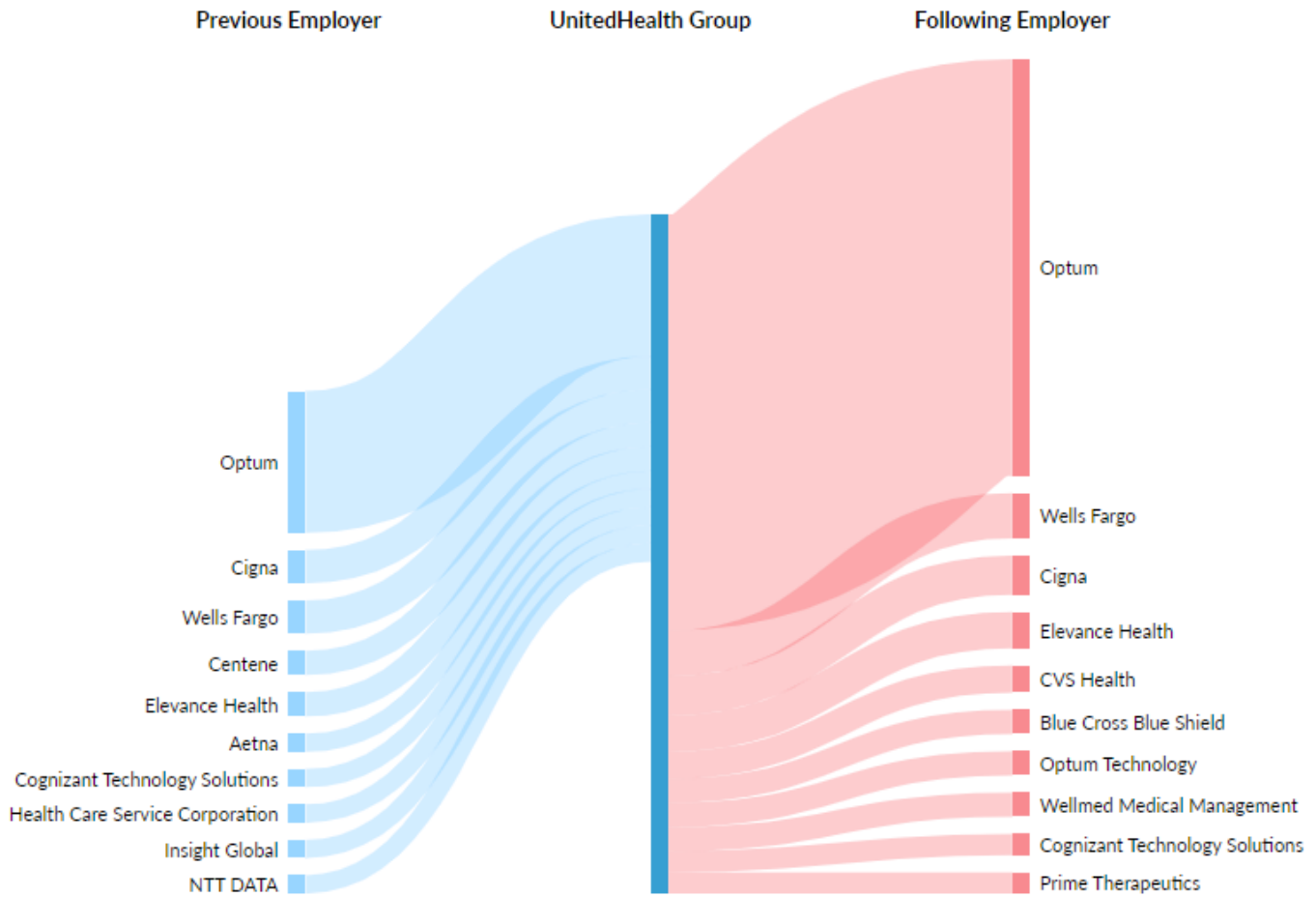
CAREER TRAJECTORIES

Computer Systems Analysts often move into the role from IT and related occupations, most frequently Management Analysts, Computer User Support Specialists, and Software Developers. After working as Computer Systems Analysts, they often move to some of those same roles that feed into the occupation, especially Management Analysts and Software Developers.



COMPANY TRAJECTORIES

UnitedHealth Group is one of the top employers of Computer Systems Analyst talent by job posting volume. UnitedHealth Group may be a first employer for many within their Computer Systems Analyst career, although those who transition from other companies most often come from Optum. After working for UnitedHealth Group, workers by far most often move to Optum, followed by other healthcare or corporate employers.



ALIGNED POSTSECONDARY PROGRAMS

There were about 1,220 awards conferred at 29 different Minnesota postsecondary institutions in programs aligned to the Computer Systems Analyst occupation in SY2023. Among, these 118 were at the Associate level, and 332 were certificates that could be earned in less than two years. The average school had about 42 completions, with a range from one to 185 completions. Nearly a third of institutions (31%) offered remote programs.

Computer Systems Analyst Postsecondary Program Awards by Level, SY2023

CIP Code	Title	Certificate < 1 Yr	Certificate 1+ but < 2 Yr	Associate's	Certificate 2+ but < 4 Yr	Bachelor's	Post-Baccalau-reate	Master's	Doctorate	Total Awards
11.0103	Information Technology	42	0	15	0	225	53	91	7	433
11.0101	Computer and Information Sciences, General	190	0	0	0	95	7	55	9	356
11.0901	Computer Systems Networking and Telecommunications	50	1	98	1	61	0	13	0	224
11.0501	Computer Systems Analysis/Analyst	0	0	0	0	141	0	0	0	141
11.0202	Computer Programming, Specific Applications	36	13	5	0	10	0	0	0	64
11.0199	Computer and Information Sciences, Other	0	0	0	0	0	0	0	2	2
	Total	318	14	118	1	532	60	159	18	1,220



Institution Type	Completions (2023)	Market Share
Public, 4-year or above	387	31.7%
Public, 2-year	243	19.9%
Private for-profit, 4-year or above	211	17.3%
Private not-for-profit, 4-year or above	201	16.5%
Other	178	14.6%

Nearly one in three (31.7%) of SY2023 awards were conferred at public four-year institutions, with University of Minnesota, Twin Cities having the largest number of completions in SY2023, followed by Summit Academy OIC, comprising about 15% each of related awards conferred. Completions are down overall by 2% from 2019.

Software Developer Postsecondary Program Awards by Institution, SY2023

Institution	Completions (2023)	Growth % YOY (2023)	Market Share (2023) ?	IPEDS Tuition & Fees (2022)	Completions Trend (2019-2023)
⊕ University of Minnesota-Twin Cities	185	2.2%	15.2%	\$15,859	
⊕ Summit Academy Opportunities Industrialization Center	178	-7.8%	14.6%	N/A	
⊕ Capella University	119	-13.8%	9.8%	\$14,328	
⊕ Minnesota State University-Mankato	108	-8.5%	8.9%	\$9,444	
⊕ University of St Thomas	104	-8.8%	8.5%	\$50,366	
⊕ Walden University	92	-30.3%	7.5%	\$11,047	
⊕ Minneapolis Community and Technical College	84	12.0%	6.9%	\$6,098	
⊕ Metropolitan State University	63	-4.5%	5.2%	\$9,684	
⊕ Macalester College	50	-13.8%	4.1%	\$62,500	
⊕ Dunwoody College of Technology	23	-14.8%	1.9%	\$24,611	

GRADUATE DEMOGRAPHICS

Postsecondary program diversity varies by program. One in five awards in Information Technology programs went to international students, while 30% of General Computer and Information Sciences program awards went to Black or African American students. Most programs have an overrepresentation of male students. SY2022 is the most recent data available for graduate demographics.

Race and Gender of Graduates Receiving Postsecondary Awards in SY2022, Minnesota

CIP Code	Description	All 2022 Graduates	International Student*	Black or African Am., non-Hispanic	Am. Indian or Alaska Native	Asian, Native Hawaiian or Other Pacific Islander	Hispanic or Latino	White, non-Hispanic	Multiple or unknown race/ethnicity	Gender Males	Gender Females
11.0103	Information Technology	468	109	54	3	57	22	181	42	327	141
11.0101	Computer and Information Sciences, General	454	39	135	7	53	26	119	75	314	140
11.0901	Computer Systems Networking and Telecommunications	241	9	36	1	38	15	139	3	200	41
11.0501	Computer Systems Analysis/Analyst	153	24	8	0	25	4	83	9	88	65
11.0202	Computer Programming, Specific Applications	88	4	7	0	10	10	45	12	67	21
11.0199	Computer and Information Sciences, Other	1	0	1	0	0	0	0	0	0	1
	All Computer Systems Analyst Postsecondary Programs	1,405	185	241	11	183	77	567	141	996	409

IPEDS SY2022 demographics by award conferred. Count of awards may double count individuals who obtained multiple credentials in the same calendar year.

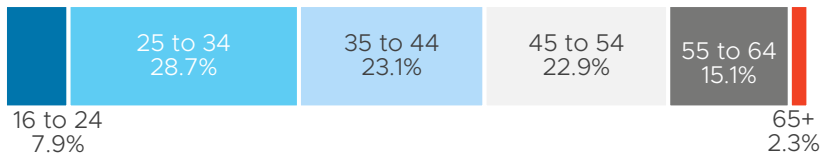
*NCES IPEDS refers to international students that do not have resident status in the United States as "nonresident aliens." This title aligns to Federal tax definitions and according to NCES IPEDS refers to "a person who is not a citizen or national of the United States and who is in this country on a visa or temporary basis and does not have the right to remain indefinitely. Note: Nonresident aliens are reported separately, rather than in any of the racial/ethnic categories." They are not included in calculations of BIPOC talent in this report as race and ethnicity information is not provided for these international students. The terminology of "international student" has been used in this report as it is more familiar to a common audience. <https://nces.ed.gov/ipeds/report-your-data/race-ethnicity-definitions>. For more information, view this article from Berkeley on tax filing status of international students. <https://internationaloffice.berkeley.edu/taxes/tax-filing-status>

Information Security Analyst

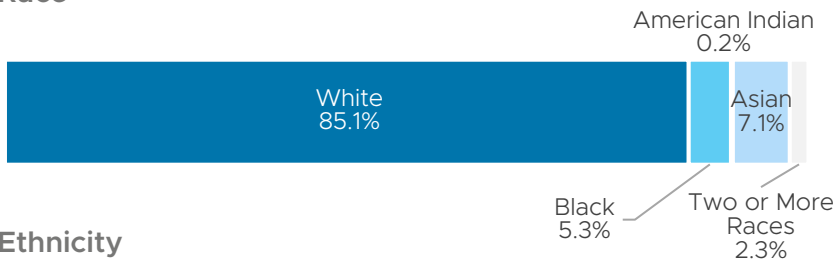
Information Security Analysts plan, implement, upgrade, or monitor security measures for the protection of computer networks and information. They assess system vulnerabilities for security risks and propose and implement risk mitigation strategies. Job titles may include Information Security Officer, Information Security Specialist, Information Systems Security Analyst, IT Security Analyst, and others.

TALENT SUPPLY DEMOGRAPHICS

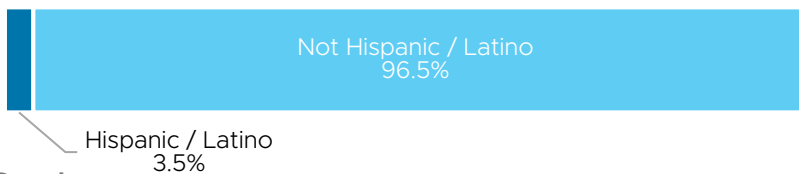
Age



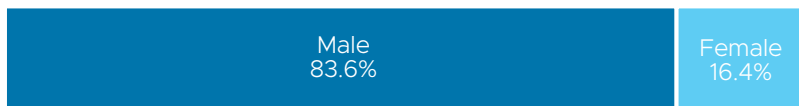
Race



Ethnicity



Gender



Top Job Titles Used by Employers

- Specialist Agent Computer Science Information Technology Background
- Information Technology Professional
- Security Analyst
- Intelligence Officer
- Information Security Consultant Hybrid

DEMAND FAST FACTS

2,890

Information Security Analyst Jobs Held by Professionals in Minnesota

2.6%

Of all Tech Occupation Employment

11

Unemployed (0.4% rate)

1,263

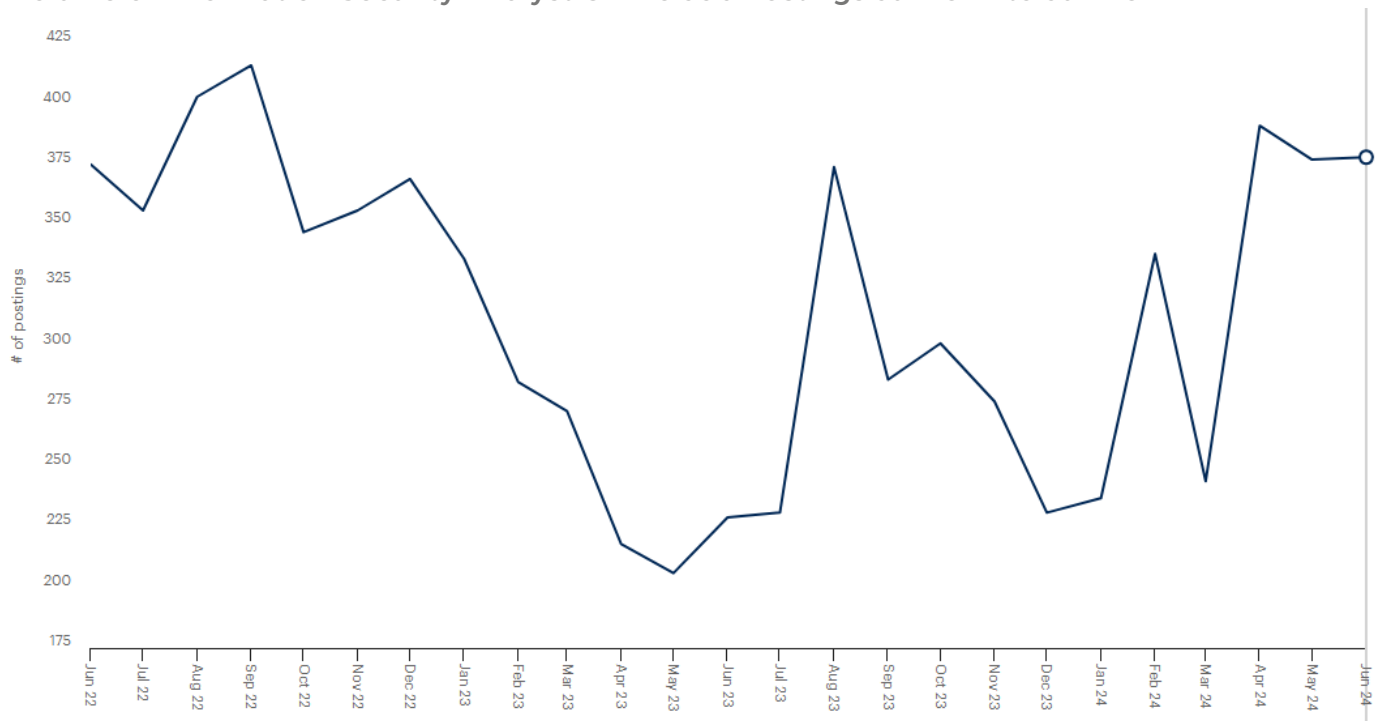
New Information Security Analysts needed in Minnesota by the beginning of 2029

JOB POSTING TRENDS

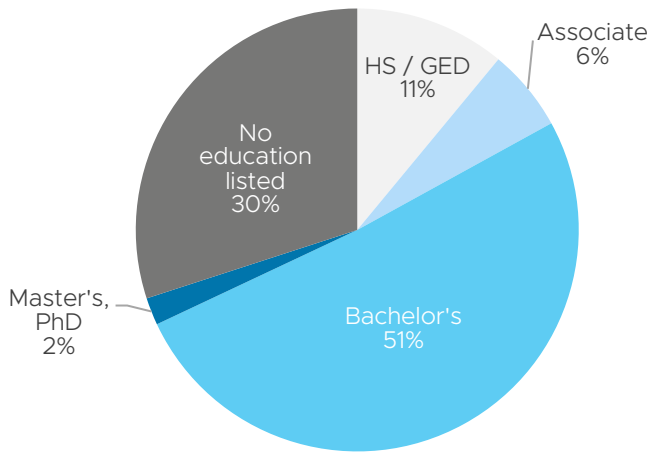
Data in this section focuses on all Information Security Analyst jobs newly advertised between July 1, 2023 and June 30, 2024 across Minnesota. Overall, there were 3,665 new jobs advertised for Information Security Analysts during this time frame, a decrease of 4% from the prior 12-month period.



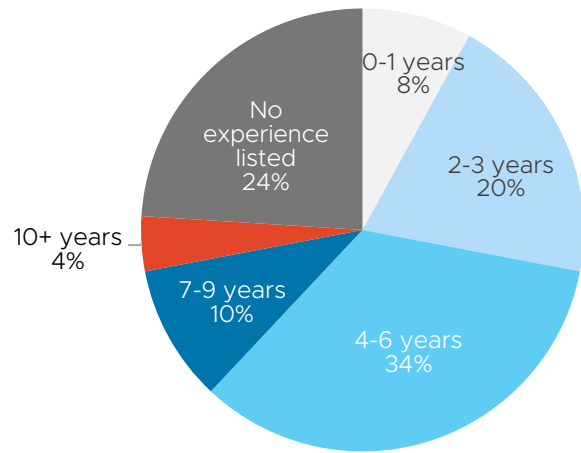
Volume of Information Security Analyst Online Job Postings Jul 2022 to Jun 2024



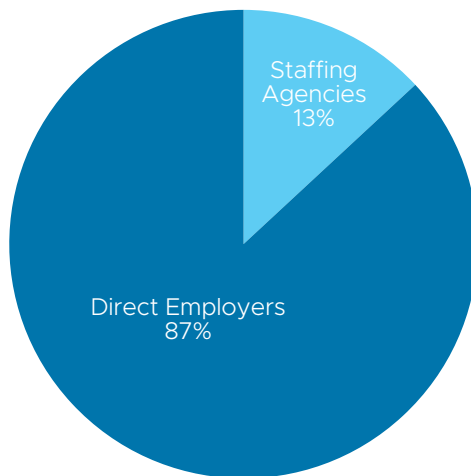
Minimum Education Level Requirements



Minimum Experience Level Requirements



New Job Postings Advertised in Minnesota by Employer Type



Top Employers by Volume of New Job Postings, With Change from Prior Year

Direct Employers only

Employer	Percent Change
1. Deloitte	28%
2. Navy	1578%
3. Wells Fargo	-42%
4. Federal Bureau of Investigation	5500%
5. U.S. Bank	-23%
6. ACCENTURE	53%
7. Target Corporation	-34%
8. Securian Financial	54%
9. State of Minnesota	700%
10. Honeywell	-37%

When staffing firms are included in the list of top employers, Robert Half International bumps Honeywell from the #10 spot.

New Job Postings by Industry or Employer Type

Industry	Total/Unique (Jul 2023 - Jun 2024)	Posting Intensity	Median Posting Duration
Commercial Banking	79 / 44	2 : 1	22 days
Custom Computer Programming Services	54 / 32	2 : 1	15 days
Computer Systems Design Services	37 / 32	1 : 1	20 days
Employment Placement Agencies	54 / 32	2 : 1	16 days
Other General Government Support	35 / 23	2 : 1	23 days
Administrative Management and General Management Consulting Services	36 / 19	2 : 1	8 days
Temporary Help Services	28 / 13	2 : 1	15 days
Engineering Services	16 / 12	1 : 1	25 days
General Medical and Surgical Hospitals	38 / 12	3 : 1	24 days
Surgical Appliance and Supplies Manufacturing	27 / 10	3 : 1	37 days

Information Security Analyst Advertised Salary Range

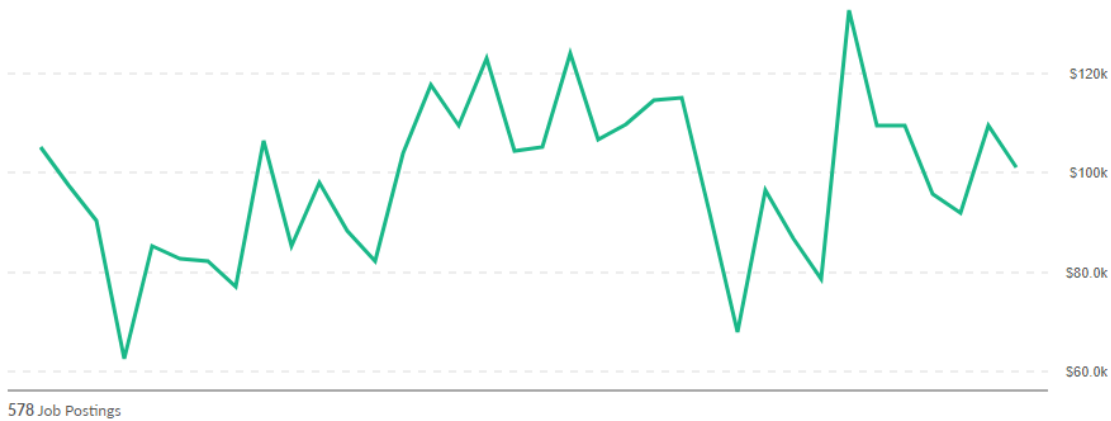
\$98.6K

Median Advertised Salary

This is \$25.8K below the government recorded median salary for Information Security Analysts in Minnesota.

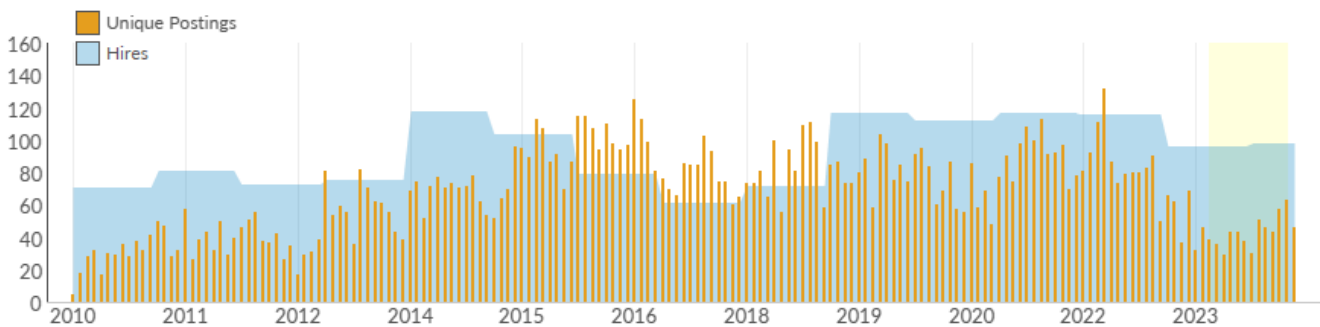


▼ 3.9% Aug 2021 - Jul 2024
\$100k Median

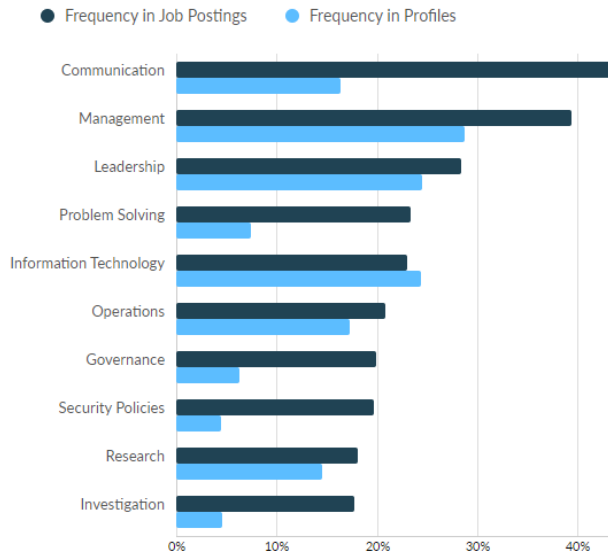


Monthly Ratio of Unique Job Postings to Estimated Hires

From Jul 2023 – Jun 2024, there were 97 Information Security Analysts hired on average each month. In this same time period, there were 43 newly posted monthly jobs — meaning there were about two people hired for every job posting.



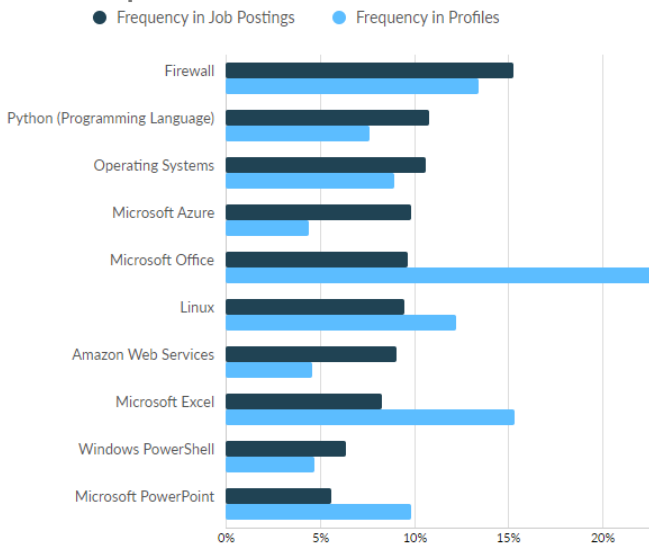
Top Common Skills



Top Specialized Skills



Top Software Skills



Top Certifications and Qualifications

Qualification	Postings with Qualification
Certified Information Systems Security Professional	131
Certified Information System Auditor (CISA)	67
GIAC Certifications	61
Certified Information Security Manager	60
CompTIA Security+	42
Valid Driver's License	24
Certified Internal Auditor	23
Certified Public Accountant	23
Certified In Risk And Information Systems Control	22
NIST Cybersecurity Framework (CSF)	20

ENTRY LEVEL JOB TITLES IN DEMAND

The following job titles are used for Information Security Analysts that may be most accessible to talent beginning their careers in Information Technology. Of the 517 job postings available in Lightcast for Information Security Analysts between July 2023 and June 2024, only 44 can be classified as entry level, requiring 0-2 years of experience and minimum education of Associate degree or less (or no requirement). Only two titles are detailed below; other job titles most accessible to entry level talent had too few postings to analyze (n=2 total posts across career stages).

Top Entry Level Information Security Analyst Job Titles

Minnesota, Jul 2023 – Jun 2024

	12 month Posting Volume	Experience Level Requirements	Education Level Requirements	Notable Skills and Credentials	Examples of Employers Recruiting
Information Security Analysts	68 total 10 entry level	34% 0-3 years 16% none listed	18% Associate or HS 38% none listed	Auditing, Risk Analysis, Vulnerability, Cyber Security, Risk Management, Certified Information Systems Security Professional	Genesis10 Mayo Clinic State of Minnesota
Cybersecurity Analysts	50 total 2 entry level	24% 0-3 years 38% none listed	4% Associate or HS 34% none listed	SQL, Computer Science, Agile Methodology, Software Development	Wipro Amentum UnitedHealth Group

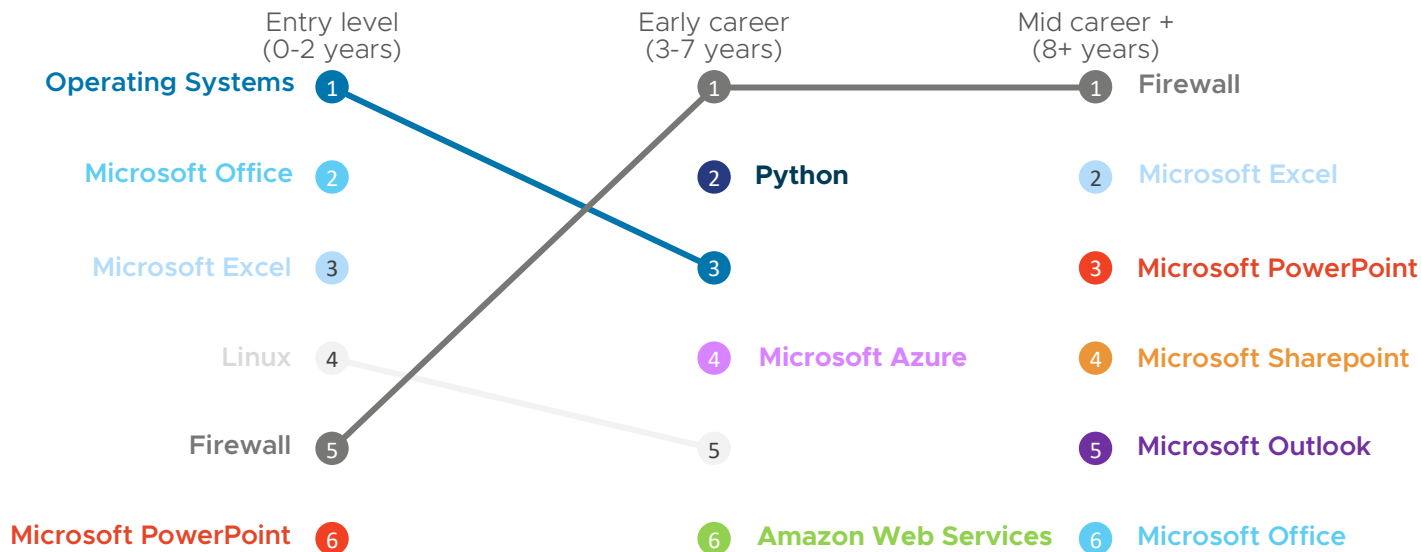
Note: "entry level" postings are those requiring 0-2 years of experience and minimum education of high school/GED, Associate degree, or no requirement listed. Postings that do not list an experience requirement are excluded from this count due to limitations of Lightcast.

CAREER MAPPING

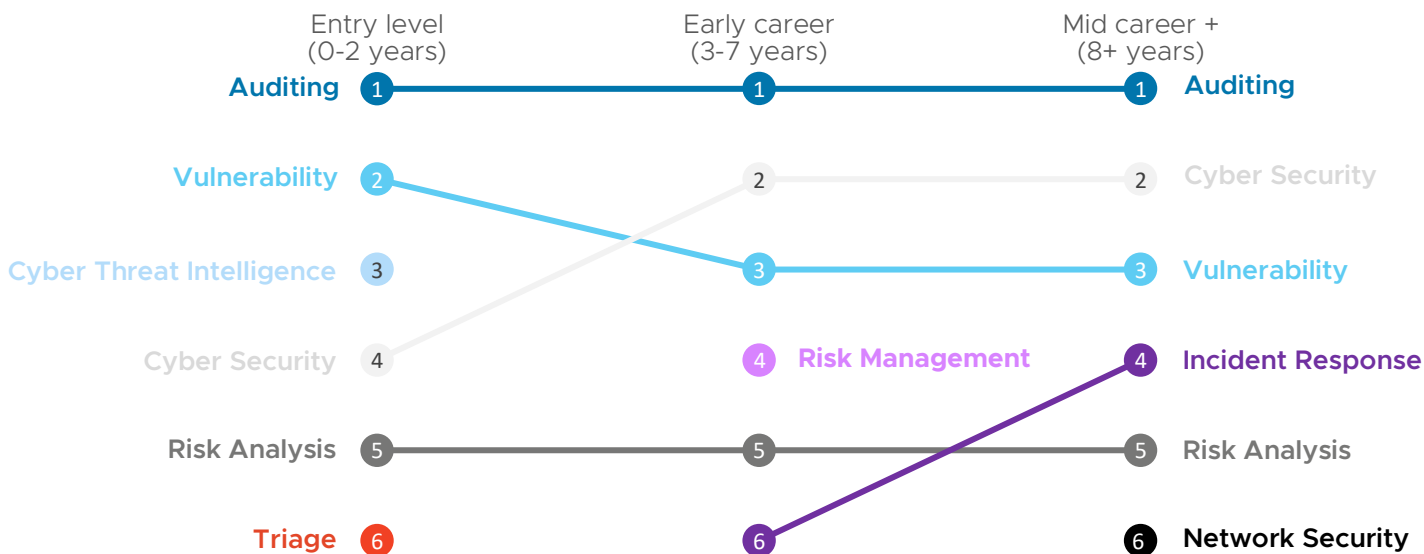
Skill Trends

Operating Systems is the top in-demand software skill for entry level Information Security Analysts, whereas Firewall is most important for early and mid-career roles. Across the career trajectory, Auditing, Cyber Security and Vulnerability are top specialized skills.

Top In-Demand Software Skills by Career Stage



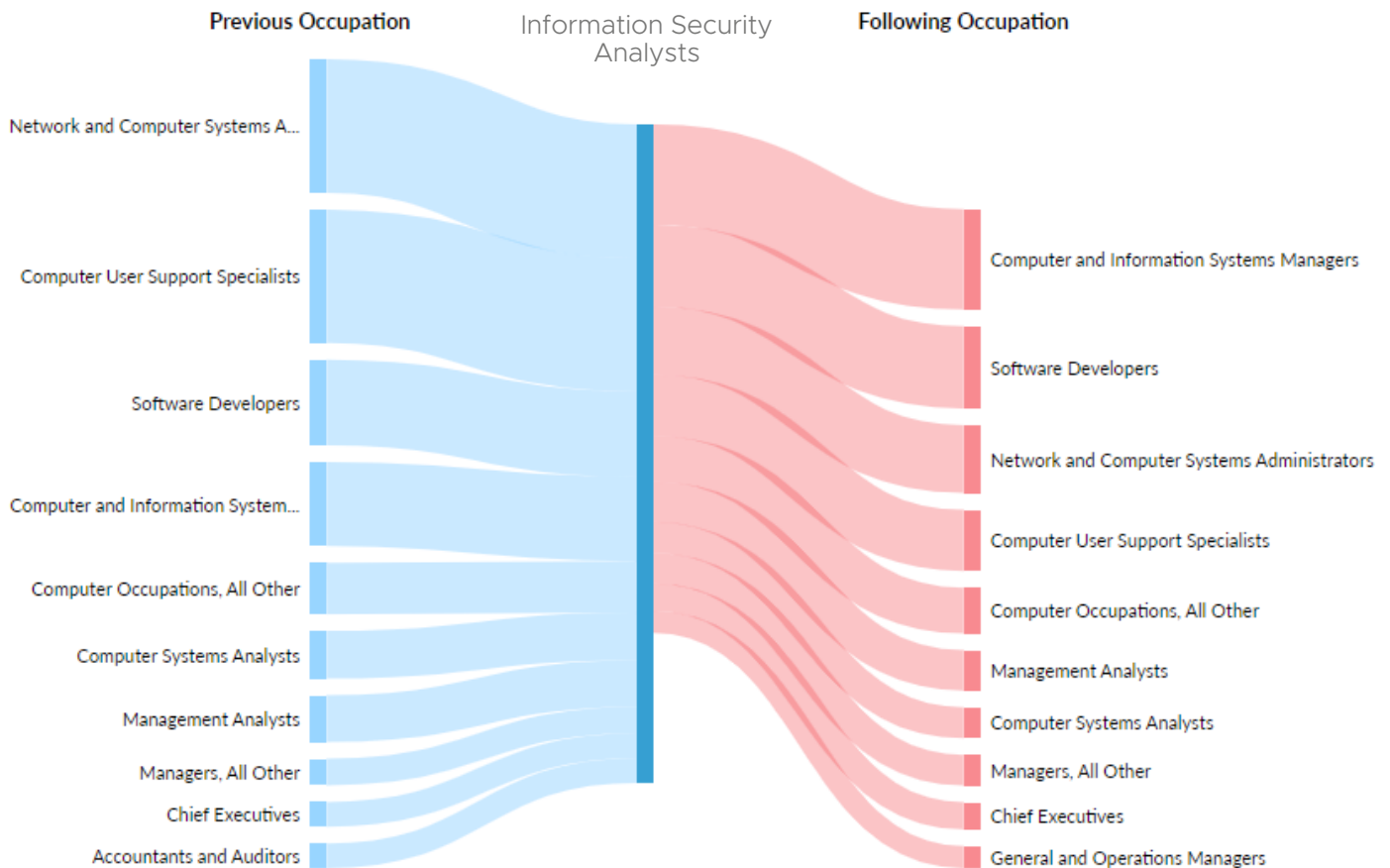
Top In-Demand Other Specialized Skills by Career Stage



Note: "Entry level" reflects job postings requesting 0-2 years of experience and minimum education of high school/GED, Associate degree, or no education mentioned. "Early career" reflects job postings requesting 3-7 years of experience and minimum education of bachelor's degree or lower, or no education mentioned. "Mid career +" reflects job postings requesting 8 or more years of experience and any minimum education level, or no education mentioned.

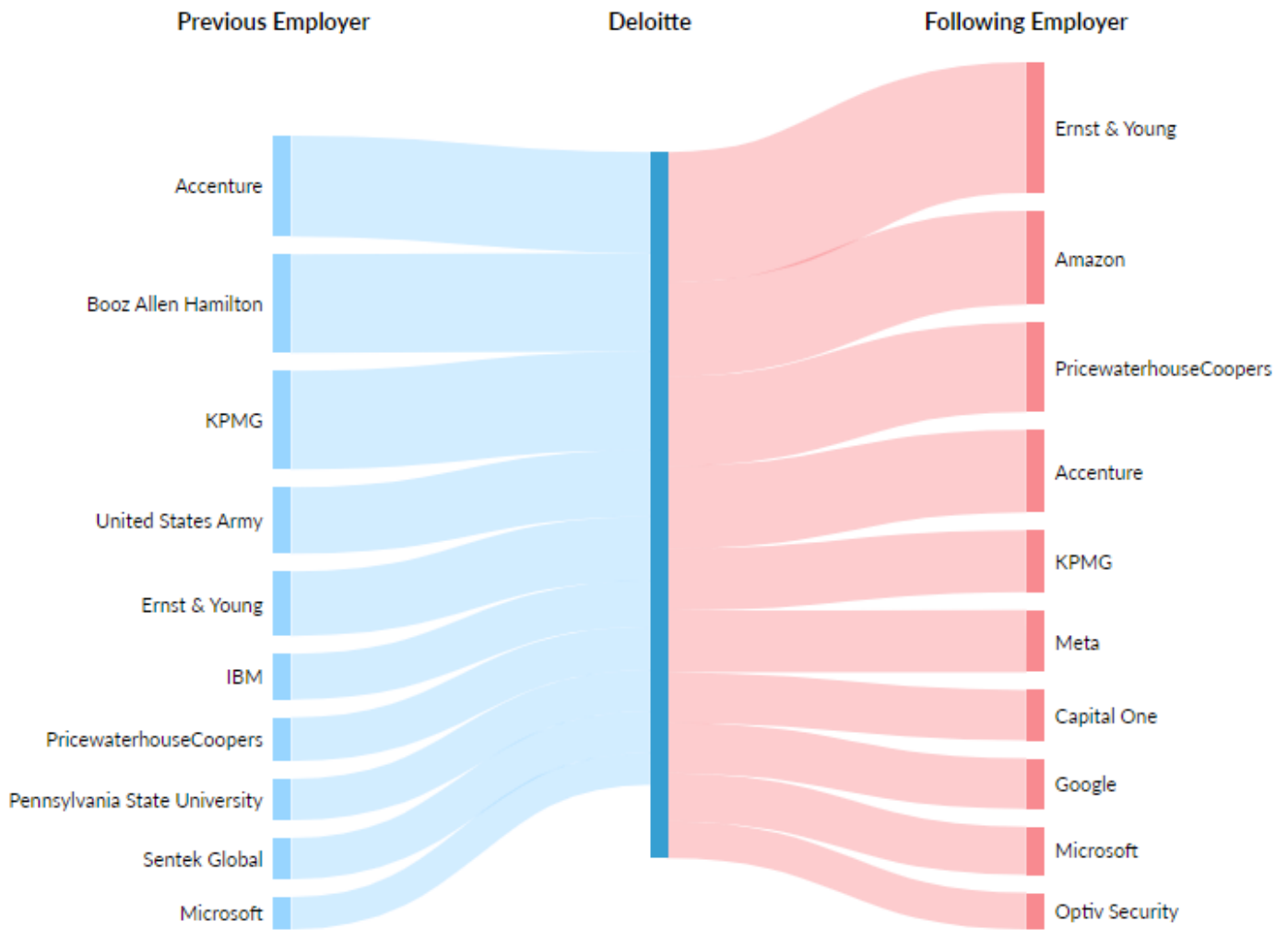
CAREER TRAJECTORIES

Information Security Analysts very often move into the role from other IT occupations. The most common of these are Network and Computer Systems Administrators and Computer User Support Specialists. Those who move on to different occupations most often remain in IT occupations or transition to management roles, most frequently becoming Computer and Information Systems Managers or Software Developers.



COMPANY TRAJECTORIES

Deloitte is one of the top employers of Information Security Analyst talent by job posting volume. Talent most frequently join Deloitte after working for other consulting companies, such as Accenture and Booz Allen Hamilton. After working for Deloitte, workers most often move to Ernst & Young, Amazon, PricewaterhouseCoopers, and Accenture. A smaller number go on to work for large tech companies such as Meta, Google, and Microsoft.



ALIGNED POSTSECONDARY PROGRAMS

There were about 2,900 awards conferred at 53 different Minnesota postsecondary institutions in programs aligned to the Information Security Analyst occupation in SY2023. Among, these 471 were at the Associate level, and 247 were certificates that could be earned in less than two years. The average school had about 55 completions, with a range from one to 763 completions. A third of institutions (34%) offered remote programs.

Information Security Analyst Postsecondary Program Awards by Level, SY2023

CIP Code	Title	Certificate < 1 Yr	Certificate 1+ but < 2 Yr	Associate's	Certificate 2+ but < 4 Yr	Bachelor's	Post- Baccalau- reate	Master's	Doctorate	Total Awards
11.0701	Computer Science	0	0	145	0	1,193	0	134	17	1,489
11.1003	Computer and Information Systems Security/Auditing/Information Assurance	34	31	96	0	171	13	134	30	509
11.0103	Information Technology	42	0	15	0	225	53	91	7	433
11.0901	Computer Systems Networking and Telecommunications	50	1	98	1	61	0	13	0	224
11.1001	Network and System Administration/Administrator	76	13	117	0	0	0	0	0	206
11.1005	Information Technology Project Management	0	0	0	0	3	1	9	3	16
11.1002	System, Networking, and LAN/WAN Management/Manager	0	0	0	0	12	0	0	0	12
43.0403	Cyber/Computer Forensics and Counterterrorism	0	0	0	0	0	0	11	0	11
	Total	202	45	471	1	1,665	67	392	57	2,900



Institution Type	Completions (2023)	Market Share
Public, 4-year or above	1,528	52.7%
Public, 2-year	660	22.8%
Private not-for-profit, 4-year or above	402	13.9%
Private for-profit, 4-year or above	310	10.7%

Over half (52.7%) of SY2023 awards were conferred at public four-year institutions, with University of Minnesota, Twin Cities having the largest number of completions in SY2023, followed by Capella University, comprising 26% and 9% respectively of related awards conferred. Completions are up overall by 6% from 2019.

Software Developer Postsecondary Program Awards by Institution, SY2023

Institution	Completions (2023)	Growth % YOY (2023)	Market Share (2023)	IPEDS Tuition & Fees (2022)	Completions Trend (2019-2023)
⊕ University of Minnesota-Twin Cities	763	14.6%	26.3%	\$15,859	
⊕ Capella University	270	-24.8%	9.3%	\$14,328	
⊕ Metropolitan State University	233	10.4%	8.0%	\$9,684	
⊕ Saint Cloud State University	186	8.1%	6.4%	\$10,117	
⊕ University of St Thomas	139	-16.8%	4.8%	\$50,366	
⊕ Minnesota State University-Mankato	133	-2.9%	4.6%	\$9,444	
⊕ Minneapolis Community and Technical College	121	23.5%	4.2%	\$6,098	
⊕ University of Minnesota-Duluth	96	-13.5%	3.3%	\$14,126	
⊕ Carleton College	69	16.9%	2.4%	\$62,634	
⊕ Hennepin Technical College	63	-17.1%	2.2%	\$5,881	

GRADUATE DEMOGRAPHICS

Postsecondary program diversity varies by program. One in five awards in Information Technology programs went to international students, while Computer and Information Systems Security/Auditing/Information Assurance programs had the largest number of Black or African American students. Most programs have an overrepresentation of male students. SY2022 is the most recent data available for graduate demographics.

Race and Gender of Graduates Receiving Postsecondary Awards in SY2022, Minnesota

CIP Code	Description	All 2022 Graduates	International Student*	Black or African Am., non-Hispanic	Am. Indian or Alaska Native	Asian, Native Hawaiian or Other Pacific Islander	Hispanic or Latino	White, non-Hispanic	Multiple or unknown race/ethnicity	Gender Males	Gender Females
11.0701	Computer Science	1,364	219	81	1	229	52	698	84	1,100	264
11.1003	Computer and Information Systems Security/Auditing/Information Assurance	521	79	114	2	30	33	217	46	407	114
11.0103	Information Technology	468	109	54	3	57	22	181	42	327	141
11.0901	Computer Systems Networking and Telecommunications	241	9	36	1	38	15	139	3	200	41
11.1001	Network and System Administration/Administrator	206	3	50	0	19	6	113	15	170	36
11.1005	Information Technology Project Management	46	0	12	0	2	3	23	6	23	23
43.0403	Cyber/Computer Forensics and Counterterrorism	18	0	5	0	1	1	9	2	12	6
11.1002	System, Networking, and LAN/WAN Management/Manager	15	0	0	1	0	3	7	4	14	1
	All Information Security Analyst Postsecondary Programs	2,879	419	352	8	376	135	1,387	202	2,253	626

IPEDS SY2022 demographics by award conferred. Count of awards may double count individuals who obtained multiple credentials in the same calendar year.

*NCES IPEDS refers to international students that do not have resident status in the United States as "nonresident aliens." This title aligns to Federal tax definitions and according to NCES IPEDS refers to "a person who is not a citizen or national of the United States and who is in this country on a visa or temporary basis and does not have the right to remain indefinitely. Note: Nonresident aliens are reported separately, rather than in any of the racial/ethnic categories." They are not included in calculations of BIPOC talent in this report as race and ethnicity information is not provided for these international students. The terminology of "international student" has been used in this report as it is more familiar to a common audience. <https://nces.ed.gov/ipeds/report-your-data/race-ethnicity-definitions>. For more information, view this article from Berkeley on tax filing status of international students. <https://internationaloffice.berkeley.edu/taxes/tax-filing-status>

Conclusion

Tech Occupation employment has grown over the past five years, yet the past 12 months have seen a downturn. Signs of a labor shortage persist, and rapid innovation, especially in artificial intelligence, is quickly changing the landscape of the field and the demand for some occupations. Simultaneously, hybrid-remote work prevalence has changed recruitment practices and talent expectations. Minnesota is also contending with high talent misalignment, where rapid upskilling and reskilling required to keep pace with sector innovation and educational requirements of positions do not match talent skills.

Below are key insights for each of four featured occupations, which fall within the [System Networks Pathway](#) (Computer Systems Analyst) and [Programming and Software Development Pathway](#) (Computer User Support Specialist, Information Security Analyst, and Software Developer):

Target Occupations	<h3>Information Security Analyst</h3> <p>Employment</p> <ul style="list-style-type: none">• A small portion of tech employment in MN, at 2.6%• Extremely low unemployment <p>Job Postings</p> <ul style="list-style-type: none">• Commercial Banking is the top industry seeking talent• Low numbers of job postings accessible to entry level talent; one in two positions requires a bachelor’s degree or more <p>Skills</p> <ul style="list-style-type: none">• Across career stages, in-demand skills include Auditing, Vulnerability, and Cyber Security• Top entry-level software skills are Operating Systems and Microsoft Office, while Firewall becomes more important for those with more experience <p>Career Trajectory</p> <ul style="list-style-type: none">• Information Security Analysts most commonly enter the occupation after working in other IT roles
Target/ Gateway Occupations	<h3>Software Developer</h3> <p>Employment</p> <ul style="list-style-type: none">• Nearly a third of all tech employment in MN• Very low unemployment, yet job postings are declining <p>Job Postings</p> <ul style="list-style-type: none">• One in five positions being advertised by a staffing agency• Currently difficult for entry level talent to break into this occupation — few roles open with low education and experience requirements <p>Skills</p> <ul style="list-style-type: none">• Top skills in demand for entry level talent are Amazon Web Services, JavaScript, SQL, Agile Methodology, and Software Engineering• For those with more experience, Java and Microsoft Azure become in-demand <p>Career Trajectory</p> <ul style="list-style-type: none">• Talent may move between Computer Systems Analyst roles and other comparably skilled tech occupations

Gateway Occupations

Computer Systems Analyst

Employment

- One in ten tech jobs is a Computer Systems Analyst
- Very low unemployment, yet job postings are declining

Job Postings

- Low volume of postings accessible to entry level talent; half of positions require at least a bachelor's degree
- Staffing agencies are the largest seekers of talent, with one in four positions being advertised by a staffing agency; Genesis10 is the top employer by posting volume
- Healthcare, consulting, and state government are top employers by job posting volume

Skills

- Top skills in demand for entry level talent are Microsoft Office, Excel, SQL, Auditing, and Workflow Management
- For those with more experience, SAP Applications, Business Systems Analysis, and Project Management become in-demand

Career Trajectory

- Talent may move between Computer Systems Analyst roles and other comparably skilled tech occupations

Origin Occupations

Computer User Support Specialist

Employment

- One in ten tech jobs is a Computer User Support Specialist
- Very low unemployment

Job Postings

- A more accessible occupation for IT talent beginning their careers; a higher percentage of job postings are open to those with lower education and experience
- One in five positions being advertised by a staffing agency; Temporary Help Services is the top industry hiring Computer User Support Specialist talent
- State and county government are among the top employers by volume of job postings

Skills

- Top skills in demand for entry level talent are Operating Systems, Microsoft Office, Active Directory, Help Desk Support, and Technical Support
- For those with more experience, Microsoft Azure, SQL, and Project Management skills become in-demand

Career Trajectory

- For some, Computer User Support Specialist may be a steppingstone from lower skilled roles (E.G., Customer Service Representative) to other IT roles
- Talent may begin their careers working for county or state government and later move on to state government or corporate employers

Appendix

Job Posting Data Methodology Note

This report draws on two sources for job posting data: TalentNeuron and Lightcast. Each has their own, proprietary set of sources (e.g., job boards) from which they scrape postings, and methodology for classifying and deduplicating postings. Therefore, job posting volumes and other data may not be comparable across the two tools.

This report uses TalentNeuron for Volume of Job Postings, Top Job Titles, Employer Types, and Top Employers. The report draws from Lightcast for Career Mapping, Minimum Education and Experience Requirements, Job Postings by Industry, Skill and Certification Analysis, Advertised Salary Range, Posting to Hire Analysis, Top Job Titles, and Aligned Postsecondary Programs.

For more information, see TalentNeuron demand data documentation at <https://talentneuron.my.site.com/Support/s/article/AboutTheData-Demand> and Lightcast data methodology documentation at <https://kb.lightcast.io/en/collections/3904183-data-methodology>.

FAQ

How is employment forecast determined?

Forecast employment growth uses national projections from the Bureau of Labor Statistics, forecasts for 2022-2032, adapted for regional growth patterns by Chmura. Employment data are based on [occupation forecasts](#) and event-based forecasts if applicable. Forecasts are developed at the county level; therefore, for detailed (6-digit NAICS) ownership-specific industries, the forecast employment growth for a zip code or place (city, town, etc.) is taken from the forecast of the county to which it belongs.

What is a location quotient?

A location quotient (LQ) is a measurement of concentration in comparison to the nation. An LQ of 1.00 indicates a region has the same concentration of an industry (or occupation) as the nation. An LQ of 2.00 would mean the region has twice the expected employment compared to the nation and an LQ of 0.50 would mean the region has half the expected employment in comparison to the nation.

What is a cluster?

A cluster is a geographic concentration of interrelated industries or occupations. If a regional cluster has a location quotient of 1.25 or greater, the region is considered to possess a competitive advantage in that cluster.

What is separation demand?

Separation demand is the number of jobs required due to separations — labor force exits (including retirements) and turnover resulting from workers moving from one occupation into another. Note that separation demand does not include all turnover — it does not include when workers stay in the same occupation but switch employers. The total projected demand for an occupation is the sum of the separation demand and the growth demand (which is the increase or decrease of jobs in an occupation expected due to expansion or contraction of the overall number of jobs in that occupation).

What is the difference between industry wages and occupation wages?

Industry wages and occupation wages are estimated via separate data sets, often the time periods being reported do not align, and wages are defined slightly differently in the two systems (for example, certain bonuses are included in the industry wages but not the occupation wages). It is therefore common that estimates of the average industry wages and average occupation wages in a region do not match exactly.

What is NAICS?

The North American Industry Classification System (NAICS) is used to classify business establishments according to the type of economic activity. The NAICS Code comprises six levels, from the “all industry” level to the 6-digit level. The first two digits define the top-level category, known as the “sector,” which is the level examined in this report.

What is SOC?

The Standard Occupational Classification system (SOC) is used to classify workers into occupational categories. All workers are classified into one of over 804 occupations according to their occupational definition. To facilitate classification, occupations are combined to form 22 major groups, 95 minor groups, and 452 occupation groups. Each occupation group includes detailed occupations requiring similar job duties, skills, education, or experience.

What occupations are included in this report?

- Software Developer (SOC 15-1252)
- Information Security Analyst (SOC 15-1212)
- Computer Systems Analyst (SOC 15-1211)
- Computer User Support Specialist (SOC 15-1232)
- Information Technology Occupation Cluster (aka “Information Technology Occupations”) (SOCs 15-1252, 15-1232, 15-1211, 15-1231, 15-1299, 15-1244, 15-1212, 15-1241, 15-1251, 15-1253, 15-1254, 15-1255, 15-1242, 15-1243)
- Information Technology, Data, and Computer Science Comprehensive Occupation Cluster (aka “Tech Cluster Occupations”) (SOCs 15-1252, 15-1232, 15-1211, 11-3021, 15-1231, 15-1299, 15-1244, 15-1212, 15-1241, 15-1251, 15-1253, 15-1254, 43-9021, 15-1255, 15-2051, 15-1242, 51-9162, 15-2041, 15-1243, 17-2061, 43-9111, 15-1221)

Who created this report?

This report was developed by RealTime Talent for the Minnesota Technology Association. It was written by Catherine Jett and Erin Olson. If you have questions about the data found in this report, or are interested in learning more, please contact the Senior Director of Strategic Research, Erin Olson at erin@realtimetalentmn.org or visit the RealTime Talent website at www.realtimetalent.org

What are the sources of information?

Sources include RealTime Talent analysis of the following: Chmura Economics JobsEQ®, 2024Q1 dataset (Baseline Forecast, Industry/Occupation Mix, Talent Supply Demographics, Demand Fast Facts); Lightcast 2024Q2 dataset (Career Mapping, Minimum Education and Experience Requirements, Job Postings by Industry, Skill and Certification Analysis, Advertised Salary Range, Posting to Hire Analysis, Top Job Titles, Aligned Postsecondary Programs); TalentNeuron (Volume of job postings, Top Job Titles, Employer Types, Top Employers)



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