

SECTOR PROFILE

Information and Communication Technologies (ICT)/Digital Media



NOVEMBER 2025



CENTER OF EXCELLENCE
FOR LABOR MARKET RESEARCH
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Introduction

To support the planning and development of career education programs and provide insights into various sector pathways, the Bay Region Center of Excellence (COE) has developed a series of sector profiles. These profiles highlight labor market trends and the postsecondary education and workforce implications within each sector in the Bay Region. They categorize jobs into three skill levels: below middle-skill, middle-skill, and above middle-skill jobs. Middle-skill occupations typically require more than a high school diploma, but less than a bachelor's degree, except in cases where a bachelor's degree is required, but more than one-third of the workforce has less than a bachelor's degree. These occupations play a crucial role in the labor workforce and contribute to the economic vitality of the 12-county Bay Region, which includes Alameda County, Contra Costa County, Marin

County, Monterey County, Napa County, San Benito County, San Francisco County, San Mateo County, Santa Clara County, Santa Cruz County, Solano County, and Sonoma County.

This information and communication technologies (ICT)/digital media profile summarizes key findings on current and projected workforce demand, hourly wages for occupations within the sector by career pathway, and program information from community colleges in the region that offer training programs in ICT/digital media. This report is intended for use by decision-makers and practitioners to support funding and grant proposals, the development of key courses and pathways, and the alignment of programs between K-12, community colleges, and four-year institutions. Workforce professionals in the sector can also use the data to gain valuable insights into employment trends and educational preparation within this pathway. We should forewarn that this sector is undergoing significant changes due to artificial intelligence (AI) and other societal factors, and we will highlight the occupations where we expect the greatest impact on future demand.

What Pathway Makes Up the ICT/Digital Media Sector?

This profile highlights the labor market for ICT/digital media, focusing on four key career pathways. The labor market data presented in this profile includes in-demand occupations within these pathways that are related to education and training programs offered at community colleges across the Bay Region.

The ICT/digital media career pathways listed below offer a range of opportunities for employment and advancement across various skill levels. The communications, information, and support services pathway spans occupations that support the production, editing, and delivery of media content, with roles such as media and communication workers, producers, directors, and film and video editors. The data, databases, and software development pathway focuses on the creation, management, and analysis of data and software systems, including careers such as computer user support specialists and data entry keyers. The networks, computer systems, and cybersecurity pathway includes occupations ranging from network support specialists and systems administrators to information security analysts and computer systems analysts. The web development and digital design pathway combines creative and technical skills to design engaging digital experiences, with careers such as photographers, web developers, digital interface designers, and advanced roles such as art directors and special effects artists and animators. Please note that this list does not include all occupations within the ICT/digital media sector.

ICT/DIGITAL MEDIA CAREER PATHWAY
Communications, Information and Support Services
Data, Databases and Software Development
Networks, Computer Systems and Cybersecurity
Web Development and Digital Design

Quick Facts About ICT/Digital Media in the Bay Region

Quick facts provide data related to the ICT/digital media sector (see below), featuring labor market projections between 2023 and 2028 in the Bay Region, as well as community college programs for program years 2021-22 to 2023-24. Enrolled students include all general admit students who were enrolled in at least one term of the selected year at a Bay Region community college.¹

The ICT/digital media sector accounted for approximately 406,850 jobs in the Bay Region in 2023, and is projected to grow by 5% between 2023 and 2028. During this five-year period, the occupations specified in this report are expected to account for 31,460 annual job openings. Please note that all numbers related to labor market data in this report are rounded to the nearest tenth. While ICT/digital media shows an average job growth of 5%, it is important to note that growth has historically been higher, and some occupations within this sector are now experiencing declining demand. We will unpack these numbers and details throughout the report.

ICT/digital media programs were offered at 28 community colleges in the Bay Region (see Table 8 for the ICT/digital media programs included). In terms of ICT/digital media programs, 48,653 students enrolled annually, on average, at a Bay Region community college during the program years 2021-22 to 2023-24, and an average of 3,211 students completed a degree or certificate each year. As for demographics, approximately 31% of students who enrolled between program years 2021-22 to 2023-24 were between 20 and 24 years old. Males were predominantly represented among students who enrolled in ICT/digital media programs (55%), as well as students who identify as Hispanic (31%) or White (23%).

Bay Region Quick Facts



406,850

Number of Jobs
in Pathways,
2023



5%

5-year Pathway
Job Growth,
2023-2028



31,460

5-year Avg. Annual
Job Openings,
2023-2028



28

Community Colleges (CC)
Offering ICT/Digital Media
Programs



48,653

Students Enrolled in
CC ICT/Digital Media Programs
(2021-22 to 2023-24)



3,211

CC Degrees/Certificates Awarded on
Average in ICT/Digital Media
(2021-22 to 2023-24)

¹ This term was updated in DataVista from “non-special admit students” used in previous reports. General admit students are defined as all students who enrolled as first-time in higher education general admit credit students in at least one primary term of the selected year with a minimal credit enrollment at the selected college who are tracked for one, two, three, four and six years from first term of enrollment. <https://datavista.cccco.edu/metrics/126>.

Projected Employment for the ICT/Digital Media Sector

Industry Employment Demand for ICT/Digital Media

The ICT/digital media sector includes sub-sectors and industries classified under the North American Industry Classification System (NAICS) codes 32, 33, 42, 51, 54, and 71 (see Appendix A: Methodology for the six-digit NAICS codes used to define the sector). A two-digit NAICS code can represent multiple sub-sectors and industry groups within the broader sector. These codes are used to organize and categorize industries within the job market.

Table 1 shows that the number of jobs in the ICT/digital media sector is projected to grow by 5% in the Bay Region over the next several years (2023-2028). In 2023, approximately 518,725 workers were employed in ICT/digital media related industries in the region, and this number is projected to increase to 546,163 workers by 2028.

Table 1: Projected Industry Demand for the ICT/Digital Media Sector

2023 JOBS	2028 JOBS	JOB CHANGE	% CHANGE
518,725	546,163	27,438	5%

Source: Lightcast, Projected Number of Industry Jobs for ICT/Digital Media, 2023-2028 [2025.1].

Occupational Demand for ICT/Digital Media Pathway

To connect overall industry trends with specific roles, the following section examines occupational demand in more detail. When examining demand for the ICT/digital media career pathway, Table 2 summarizes the number of workers employed in this pathway in 2023 and the total projected openings between 2023 and 2028 in the Bay Region. The data, databases and software development pathway employed 245,310 workers in 2023, and is also projected to have 91,060 total openings across the five-year period.

Table 2: Number of Jobs and Total Openings for ICT/Digital Media Career Pathway (2023-2028)

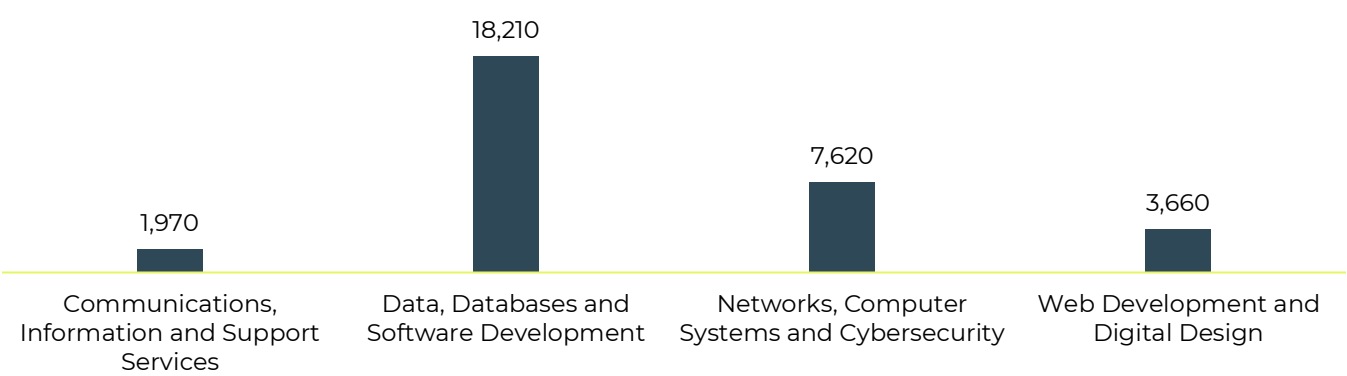
PATHWAY	2023 JOBS	2023 - 2028 TOTAL OPENINGS*
Communications, Information and Support Services	20,130	9,880
Data, Databases and Software Development	245,310	91,060
Networks, Computer Systems and Cybersecurity	99,880	38,110
Web Development and Digital Design	41,530	18,280

Source: Lightcast, Number of Jobs and Total Openings, 2023-2028 [2025.1].

*2023-2028 total openings are new job openings and replacement job openings across the five-year period. Replacement openings are created as workers switch jobs, retire or leave for other reasons.

In terms of average annual openings, Figure 1 shows the projected average annual job openings for the ICT/digital media career pathway between 2023 and 2028. While recent years have seen a decline in online job postings for some occupations, these overall projections continue to indicate growth as the sector stabilizes from the expansion of new areas such as AI and digital infrastructure. More than 18,200 average annual job openings are projected for occupations in the data, databases and software development pathway between 2023 and 2028, followed by over 7,600 average annual openings for the networks, computer systems and cybersecurity pathway.

Figure 1: Average Annual Job Openings for ICT/Digital Media Career Pathway (2023-2028)



Source: Lightcast, Average Annual Job Openings, 2023-2028 [2025.1].

Occupations and Skill Levels by ICT/Digital Media Pathway

When examining specific occupations within the ICT/digital media pathway, Table 3 below presents data on employment and projected demand by occupation, grouped by career pathway and skill level. The communications, information and support services pathway and the web development and digital design pathway are the largest, with nine occupations in each pathway. Please note that the figures in Table 3 are rounded to the nearest tenth, and totals represent the summed averages. On average, 87% of job openings in the pathway are replacement openings. Replacement openings occur when workers switch jobs, retire or leave for other reasons. Please refer to the Methodology section, in Appendix A, for more information on how the pathways were developed.

Table 3 shows that the number of jobs over the five-year period is declining for several occupations. For example, within the communications, information, and support services pathway, editors and broadcast announcers and radio disc jockeys show declining trends of 5% and 11%, respectively. In the data, databases, and software development pathway, data entry keyers and computer programmers are projected to decline by 7% and 6%. In contrast, all occupations within the networks, computer systems, and cybersecurity pathway are expected to grow by at least 2% or more. Finally, within the web development and digital design pathway, four occupations (e.g., media and communication equipment workers, all other; photographers; art directors; and graphic designers) are projected to decline by 2% to 3%.

This data shows that while overall ICT/digital media job growth is projected to increase by 5%, some occupations are experiencing much higher growth while others are declining, making it important to understand specific trends for each pathway.

SKILL LEVEL LEGEND

• = Below Middle-Skill •• = Middle-Skill ••• = Above Middle-Skill

Table 3: Occupations and Projected Demand for ICT/Digital Media (2023-2028)

Skill Level	Occupation	Avg. Annual Openings	2023 Jobs	5-Yr Change	5-Yr % Change	5-Yr Annual Replacement Jobs	Replacements as % of Openings
Communications, Information and Support Services							
•	Media and Communication Workers, All Other	120	1,330	10	0%	110	87%
•	Photographic Process Workers and Processing Machine Operators	30	250	-10	-1%	30	97%
••	Audio and Video Technicians	270	2,670	100	4%	240	88%
••	Sound Engineering Technicians	100	1,000	40	4%	90	82%
•••	Producers and Directors	690	7,400	60	1%	600	87%

Skill Level	Occupation	Avg. Annual Openings	2023 Jobs	5-Yr Change	5-Yr % Change	5-Yr Annual Replacement Jobs	Replacements as % of Openings
...	Editors	400	3,910	-210	-5%	380	93%
...	Film and Video Editors	190	1,860	90	5%	160	82%
...	Camera Operators, Television, Video, and Film	110	1,080	60	6%	90	83%
...	Broadcast Announcers and Radio Disc Jockeys	60	630	-70	-11%	60	94%
	TOTAL	1,970	20,130	70	0%	1,760	88%

Data, Databases and Software Development

..	Computer User Support Specialists	1,560	18,630	1,260	7%	1,250	89%
..	Data Entry Keyers	330	2,980	-220	-7%	330	99%
...	Software Developers	12,970	179,950	10,720	6%	9,580	75%
...	Software Quality Assurance Analysts and Testers	1,280	16,860	540	3%	1,020	86%
...	Data Scientists	1,230	13,960	1,800	13%	860	70%
...	Computer Programmers	450	7,420	-460	-6%	430	96%
...	Database Administrators	200	2,770	160	6%	160	86%
...	Database Architects	190	2,740	110	4%	160	88%
	TOTAL	18,210	245,310	13,910	3%	13,790	86%

Networks, Computer Systems and Cybersecurity

..	Computer Network Support Specialists	340	3,940	320	8%	270	85%
..	Computer Network Architects	460	7,560	150	2%	390	90%
..	Network and Computer Systems Administrators	650	9,750	410	4%	540	89%
...	Computer and Information Systems Managers	3,720	48,350	1,890	4%	3,100	85%
...	Computer Systems Analysts	1,420	18,820	1,210	6%	1,110	86%
...	Information Security Analysts	710	7,620	1,170	15%	470	71%
...	Computer and Information Research Scientists	320	3,840	300	8%	240	73%
	TOTAL	7,620	99,880	5,450	7%	6,120	86%

Web Development and Digital Design

•	Lighting Technicians	30	270	20	7%	20	82%
•	Media and Communication Equipment Workers, All Other	30	370	-10	-3%	30	95%
..	Web and Digital Interface Designers	980	11,850	340	3%	820	90%
..	Photographers	460	5,220	-160	-3%	450	97%

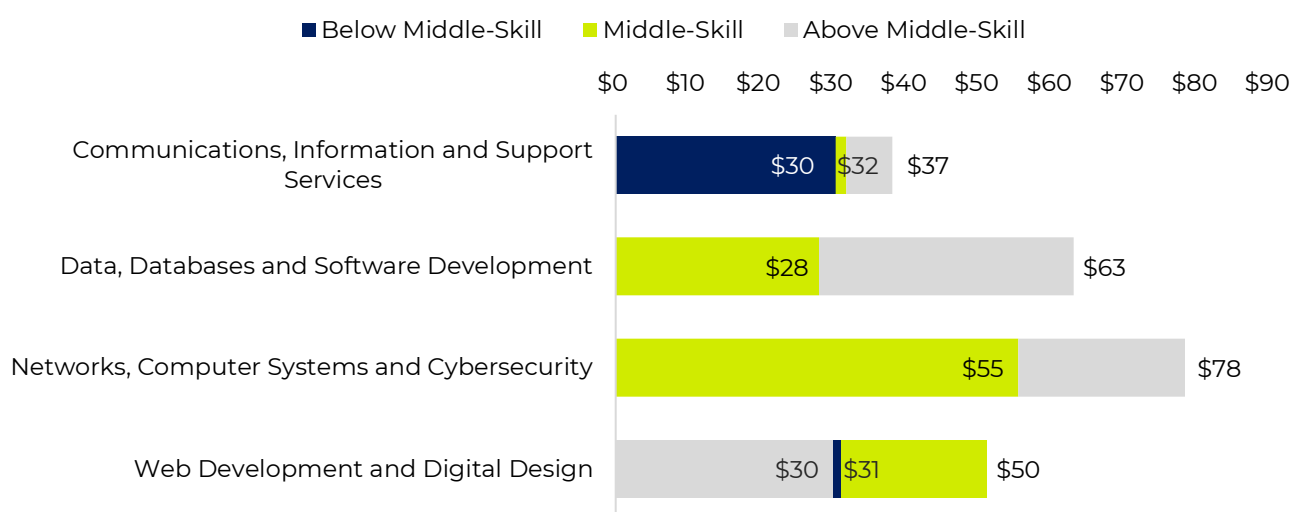
Skill Level	Occupation	Avg. Annual Openings	2023 Jobs	5-Yr Change	5-Yr % Change	5-Yr Annual Replacement Jobs	Replacements as % of Openings
• •	Web Developers	390	4,950	280	6%	310	85%
• • •	Graphic Designers	810	9,720	-180	-2%	770	94%
• • •	Art Directors	390	4,070	-80	-2%	370	96%
• • •	Special Effects Artists and Animators	300	2,860	60	2%	260	89%
• • •	Fine Artists, Including Painters, Sculptors, and Illustrators	270	2,220	240	11%	220	80%
	TOTAL	3,660	41,530	510	2%	3,250	90%
ICT/DIGITAL MEDIA TOTAL		31,460	406,850	19,940	5%	24,920	87%

Source: Lightcast, Projected Demand for ICT/Digital Media Occupations, 2023-2028 [2025.1].

Occupational Wages by ICT/Digital Media Pathway

In the Bay Region, the living wage is \$46 per hour for one adult and one school aged child, though it varies by subregion (see Table 12 in the Appendix for details). Figure 2 presents the average median hourly earnings for below middle-skill, middle-skill, and above middle-skill jobs by career pathway. Table 4 provides a summary of wages by the 25th percentile, median, and 75th percentile hourly earnings for each occupation. All earnings represent the median across the 12-counties in the Bay Region. The 25th percentile wage represents entry-level earnings, while the 75th percentile wage reflects the earnings of experienced workers.

Figure 2: Average Median Hourly Earnings by ICT/Digital Media Career Pathway



Source: Lightcast, Median Hourly Wages by ICT/Digital Media Career Pathway [2025.1].

Table 4: Hourly Earnings for Occupations by ICT/Digital Media Career Pathway

SKILL LEVEL LEGEND				
• = Below Middle-Skill •• = Middle-Skill ••• = Above Middle-Skill				
Skill Level	Occupation	25 th Pct. Hourly Earnings	Median Hourly Earnings	75 th Pct. Hourly Earnings
Communications, Information and Support Services				
•	Media and Communication Workers, All Other	\$24	\$38	\$53
•	Photographic Process Workers and Processing Machine Operators	\$17	\$23	\$35
••	Sound Engineering Technicians	\$24	\$37	\$64

Skill Level	Occupation	25 th Pct. Hourly Earnings	Median Hourly Earnings	75 th Pct. Hourly Earnings
••	Audio and Video Technicians	\$22	\$27	\$37
•••	Producers and Directors	\$30	\$46	\$69
•••	Editors	\$26	\$36	\$50
•••	Broadcast Announcers and Radio Disc Jockeys	\$24	\$34	\$51
•••	Film and Video Editors	\$22	\$36	\$56
•••	Camera Operators, Television, Video, and Film	\$20	\$31	\$49
	TOTAL	\$23	\$34	\$52
Data, Databases and Software Development				
••	Computer User Support Specialists	\$28	\$35	\$46
••	Data Entry Keyers	\$18	\$21	\$24
•••	Software Developers	\$67	\$74	\$91
•••	Database Architects	\$58	\$73	\$88
•••	Data Scientists	\$52	\$70	\$85
•••	Software Quality Assurance Analysts and Testers	\$45	\$59	\$73
•••	Database Administrators	\$36	\$57	\$67
•••	Computer Programmers	\$30	\$48	\$65
	TOTAL	\$42	\$55	\$67
Networks, Computer Systems and Cybersecurity				
••	Computer Network Architects	\$57	\$73	\$90
••	Network and Computer Systems Administrators	\$42	\$55	\$69
••	Computer Network Support Specialists	\$31	\$38	\$47
•••	Computer and Information Systems Managers	\$78	\$95	\$112
•••	Computer and Information Research Scientists	\$73	\$88	\$107
•••	Information Security Analysts	\$54	\$69	\$81
•••	Computer Systems Analysts	\$47	\$61	\$74
	TOTAL	\$55	\$68	\$83
Web Development and Digital Design				
•	Lighting Technicians	\$21	\$32	\$44
•	Media and Communication Equipment Workers, All Other	\$20	\$30	\$49
••	Web and Digital Interface Designers	\$40	\$66	\$85
••	Web Developers	\$33	\$55	\$73

Skill Level	Occupation	25 th Pct. Hourly Earnings	Median Hourly Earnings	75 th Pct. Hourly Earnings
• •	Photographers	\$17	\$29	\$54
• • •	Graphic Designers	\$22	\$34	\$49
• • •	Art Directors	\$19	\$41	\$70
• • •	Special Effects Artists and Animators	\$13	\$33	\$51
• • •	Fine Artists, Including Painters, Sculptors, and Illustrators	\$5	\$13	\$27
	TOTAL	\$21	\$37	\$56
ICT/DIGITAL MEDIA TOTAL		\$35	\$49	\$65

Source: Lightcast, 25th pct., Median, and 75th pct. Hourly Earnings for ICT/Digital Media Occupations [2025.1].

Job Postings for ICT/Digital Media Occupations

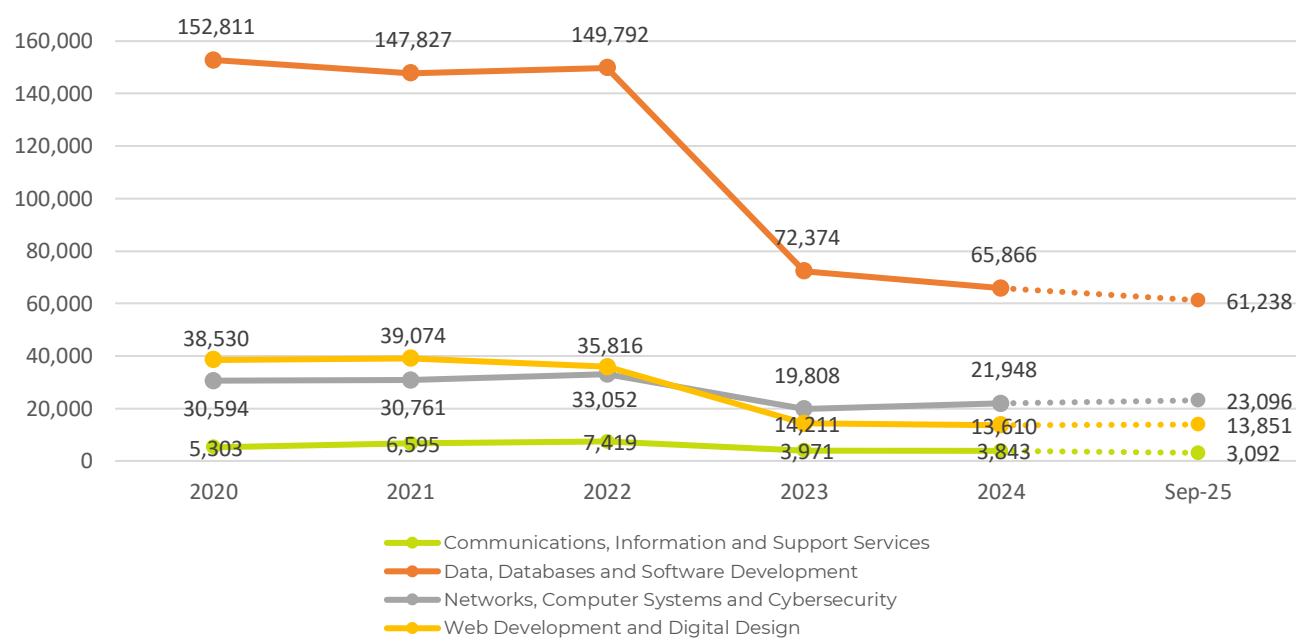
Job postings represent the number of online jobs advertised in the Bay Region for occupations in the ICT/digital media pathway specified in this report. Unique online job postings are deduplicated based on job title, employer, and region. Across occupations in the ICT/digital media pathway, there were 105,267 unique online job postings in the Bay Region from January 2024 to December 2024 (see Table 5).

Table 5: Unique Online Job Postings for ICT/Digital Media Occupations in the Bay Region, 2024

Unique Online Job Postings in the Bay Region
105,267

Figure 3 summarizes online job postings over a five year period, and includes available data through September 2025. The career pathway with the largest decrease in online job postings was web development and digital design (65% decrease between 2020 and 2024), followed by data, databases, and software development, which saw a 57% decrease. These trends indicate that online job postings declined most significantly between 2022 and 2024. It is important to note that the apparent contrast between job postings and job growth reflects differences between short-term hiring activity and long-term job growth. The decline in postings can indicate a temporary slowdown in hiring amid current AI trends, rather than a reduction in workforce demand. Figure 3 includes data through September 2025, and the number of job postings so far continues to mirror the levels seen in 2023.

Figure 3: Unique Job Postings by Career Pathways in the Bay Region, (Jan 2020 – Sep 2025)



Source: Lightcast, Job Posting Analytics, January 2024-September 2025.

Table 6 highlights the top 10 skills sought by employers, categorized into specialized, soft, and technical skills between January 2024 and December 2024.

Table 6: Top Skills in Job Postings for ICT/Digital Media Occupations, 2024

Specialized Skills	Soft Skills	Technical Skills
Computer Science	Communication	Python
Python	Problem Solving	SQL
Software Engineering	Management	Amazon Web Services
Scalability	Troubleshooting	C++
Machine Learning	Leadership	Java
Software Development	Research	Application Programming Interface (API)
SQL	Operations	JavaScript
Automation	Innovation	Linux
Amazon Web Services	Customer Service	Microsoft Azure
Artificial Intelligence	Detail Oriented	Kubernetes

Source: Lightcast, Job Posting Analytics, January 2024-December 2024.

Table 7 lists the top employers in the ICT/digital media sector in the Bay Region, which include tech companies, business services and consulting companies, and retail companies.

Table 7: Top Employers in Job Postings for ICT/Digital Media Occupations, 2024

Top Employers 	• Apple • Amazon • Google • Meta • Nvidia • TikTok	• Walmart • Accenture • Tesla • Uber • Randstad • Insight Global
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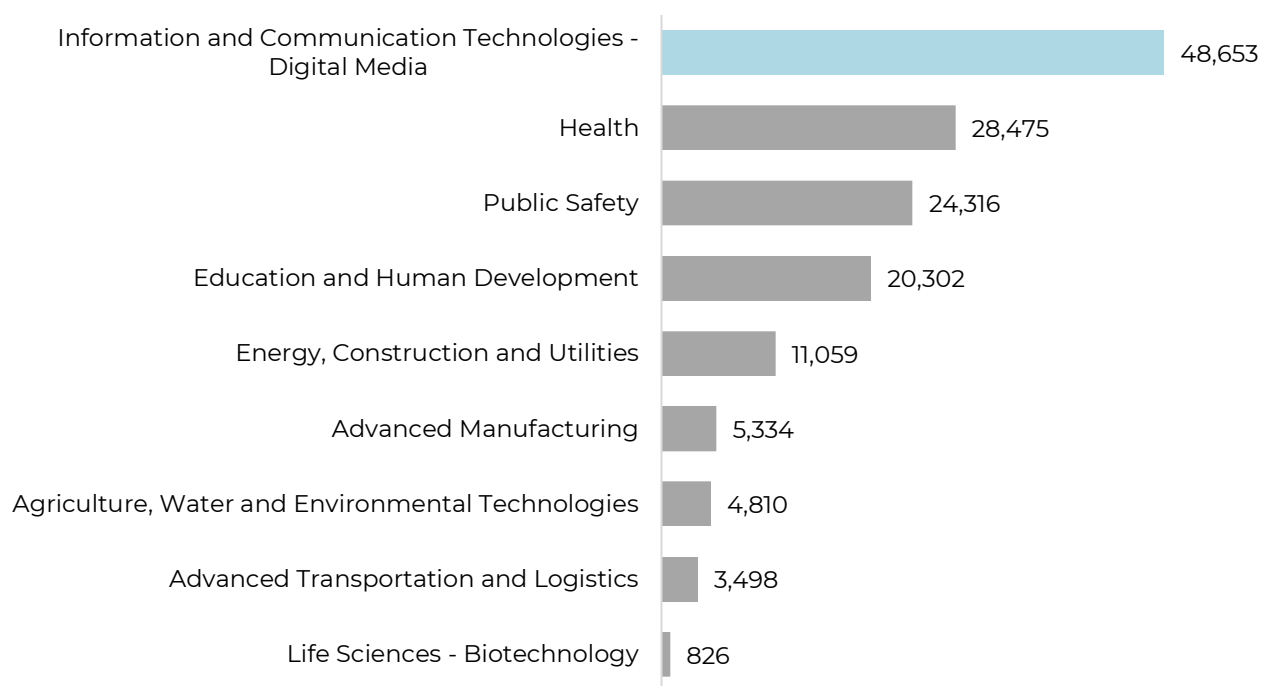
Source: Lightcast, Job Posting Analytics, January 2024-December 2024.

ICT/Digital Media Community College Programs

California community colleges offer a variety of programs in ICT/digital media, training students for a career pathway in communications, information and support services; data, databases and software development; networks, computer systems and cybersecurity; and web development and digital design. Colleges combine classroom instruction on campus, online, or through external work experiences. Of the 28 community colleges in the Bay Region, 28 offer a program related to ICT/digital media. These community colleges include Alameda College, Berkeley City College, Chabot College, Laney College, Las Positas College, Merritt College, Ohlone College, Contra Costa College, Diablo Valley College, Los Medanos College, San Francisco City College, Canada College, San Mateo College, Skyline College, Marin College, Napa Valley College, Solano College, Santa Rosa College, Hartnell College, Monterey Peninsula College, Cabrillo College, De Anza College, Evergreen Valley College, Foothill College, Gavilan College, Mission College, San Jose City College, and West Valley College.

Figure 4 shows the number of students enrolled by each of the Bay Region's nine sectors. These sectors refer to the priority sectors identified by the California Community Colleges Chancellor's Office. During program years 2021-22 to 2023-24, an average of more than 48,650 students enrolled in ICT/digital media programs each year. For more information about the selection of programs and data sources for student outcomes see Appendix A: Methodology.

Figure 4: Students Enrolled* by Sector (3-YR Average, 2021-22 to 2023-24)



Source: DataVista, Program Years 2021-22 to 2023-24, Bay Region Community Colleges.

*All students who were enrolled as a non-special admit student in at least one term of the selected year.

Thirty-three (33) Taxonomy of Program (TOP) codes related to ICT/digital media are presented in Table 8, and these TOP codes also have active or approved programs prior to October 2024 in Bay Region community colleges. This is based on information reported to the California Community Colleges Chancellor's Office Curriculum Inventory (COCI).

Table 8: ICT/Digital Media Programs at Community Colleges in the Bay Region

TOP6	TOP6 Program Title	# Colleges w/Programs
051400	Office Technology/Office Computer Applications	20
103000	Graphic Art and Design	16
060200	Journalism	15
060420	Television (including combined TV/Film/Video)	15
070200	Computer Information Systems	15
070710	Computer Programming	15
070810	Computer Networking	15
061400	Digital Media	12
100500	Commercial Music	12
061430	Website Design and Development	11
070820	Computer Support	11
061220	Film Production	10
101200	Applied Photography	10
061410	Multimedia	9
070800	Computer Infrastructure and Support	9
070210	Software Applications	8
061440	Animation	7
061460	Computer Graphics and Digital Imagery	7
070100	Information Technology, General	7
060400	Radio and Television	6
069900	Other Media and Communications	6

TOP6	TOP6 Program Title	# Colleges w/Programs
070700	Computer Software Development	5
220610	Geographic Information Systems	5
061420	Electronic Game Design	4
070720	Database Design and Administration	4
070900	World Wide Web Administration	4
070730	Computer Systems Analysis	3
061000	Mass Communications	2
079900	Other Information Technology	2
093430	Telecommunications Technology	2
060430	Broadcast Journalism	1
061450	Desktop Publishing	1
101300	Commercial Art	1

Source: California Community Colleges Chancellor's Office Curriculum Inventory (COCI). This list includes the programs under the TOP code that were currently active or approved in Bay Region community colleges prior to October 2024.

Tables 9 and 10 summarize the educational supply by analyzing the number of certificates and degrees awarded in related TOP and Classification of Instructional Programs (CIP) codes, respectively. According to TOP data, an average of 3,211 awards were conferred at Bay Region community colleges between the program years 2021-22 and 2023-24 (Table 9). The average number of awards in programs may include students who earned multiple degrees, certificates, or awards.

Table 9: Total Awards at Community Colleges in the Bay Region (2021-22 to 2023-24)

TOP6	TOP6 Title	Certificate	Associate Degree/ Associate for Transfer	Noncredit Award	Credit Award	Total Awards
051400	Office Technology/Office Computer Applications	96	34	94	63	287
060200	Journalism	3	49	0	0	52
060400	Radio and Television	21	5	0	0	26
060420	Television (including combined TV/film/video)	18	151	0	0	169
061000	Mass Communications	0	3	0	0	3
061220	Film Production	36	25	0	0	61
061400	Digital Media	56	44	0	0	100
061410	Multimedia	43	39	2	0	84
061420	Electronic Game Design	11	9	0	0	20
061430	Website Design and Development	27	20	0	0	47
061440	Animation	15	34	2	0	51
061460	Computer Graphics and Digital Imagery	44	0	1	18	63
069900	Other Media and Communications	0	1	0	0	1
070100	Information Technology, General	81	40	0	0	121
070200	Computer Information Systems	149	87	0	0	236
070210	Software Applications	54	22	32	0	108
070700	Computer Software Development	47	8	0	0	55
070710	Computer Programming	326	244	5	0	575
070720	Database Design and Administration	8	2	0	0	10
070730	Computer Systems Analysis	36	0	0	0	36

TOP6	TOP6 Title	Certificate	Associate Degree/ Associate for Transfer	Noncredit Award	Credit Award	Total Awards
070800	Computer Infrastructure and Support	42	11	16	17	86
070810	Computer Networking	319	147	0	0	466
070820	Computer Support	43	5	0	0	48
070900	World Wide Web Administration	11	3	0	0	14
079900	Other Information Technology	23	0	0	0	23
100500	Commercial Music	51	35	1	0	87
101200	Applied Photography	67	14	7	0	88
101300	Commercial Art	2	0	0	0	2
103000	Graphic Art and Design	106	131	0	0	237
220610	Geographic Information Systems	46	9	0	0	55
Total Awards		1,781	1,172	160	98	3,211

Source: CCCC DataMart. Program Years 2021-22 to 2023-24 Annual Awards, by TOP6 Code, Bay Region Community Colleges.

According to CIP data (Table 10), non-community college institutions in the Bay Region conferred an average of 2,172 awards each year between program years 2020-21 and 2022-23. The total number of awards for a given TOP or CIP code is calculated as a three-year average and summed across award types. Please note that these figures were not rounded.

Table 10: Awards* for Non-Community College Programs in the Bay Region (2020-21 to 2022-23)

CIP - CIP Program Title	Certificate	Associate Degree	Bachelor's Degree	Total Awards
09.0102 - Mass Communication/Media Studies	1	0	273	274
09.0401 - Journalism	0	1	86	87
09.0701 - Radio and Television	0	0	273	273
09.0702 - Digital Communication and Media/Multimedia	0	0	24	24
09.9999 - Communication, Journalism, and Related Programs, Other	0	0	12	12
10.0203 - Recording Arts Technology/Technician	0	1	7	8
10.0304 - Animation, Interactive Technology, Video Graphics, and Special Effects	0	7	183	190
11.0101 - Computer and Information Sciences, General	0	0	3	3
11.0103 - Information Technology	19	0	1	20
11.0199 - Computer and Information Sciences, Other	0	0	471	471
11.0201 - Computer Programming/Programmer, General	1	0	58	59
11.0202 - Computer Programming, Specific Applications	0	0	3	3
11.0301 - Data Processing and Data Processing Technology/Technician	0	0	13	13
11.0801 - Web Page, Digital/Multimedia and Information Resources Design	0	2	28	30
11.0803 - Computer Graphics	0	8	72	80
11.0899 - Computer Software and Media Applications, Other	0	2	15	17
11.1001 - Network and System Administration/Administrator	0	8	0	8
11.1003 - Computer and Information Systems Security/Auditing/Information Assurance	0	0	0	0
11.1006 - Computer Support Specialist	14	0	0	14
11.9999 - Computer and Information Sciences and Support Services, Other	0	0	0	0

CIP - CIP Program Title	Certificate	Associate Degree	Bachelor's Degree	Total Awards
15.1204 - Computer Software Technology/Technician	0	0	0	0
23.1303 - Professional, Technical, Business, and Scientific Writing	0	0	2	2
30.7001 - Data Science, General	0	0	0	0
30.7101 - Data Analytics, General	1	0	0	1
50.0102 - Digital Arts	0	5	36	41
50.0402 - Commercial and Advertising Art	2	0	0	2
50.0409 - Graphic Design	0	0	30	30
50.0411 - Game and Interactive Media Design	0	0	140	140
50.0602 - Cinematography and Film/Video Production	15	16	60	91
50.0699 - Film/Video and Photographic Arts, Other	0	0	160	160
50.0903 - Music Performance, General	0	1	60	61
50.0913 - Music Technology	0	0	17	17
52.0401 - Administrative Assistant and Secretarial Science, General	12	5	0	17
52.0407 - Business/Office Automation/Technology/Data Entry	24	0	0	24
Total Awards	89	56	2,027	2,172

*Total awards do not include degrees higher than a bachelor's degree.

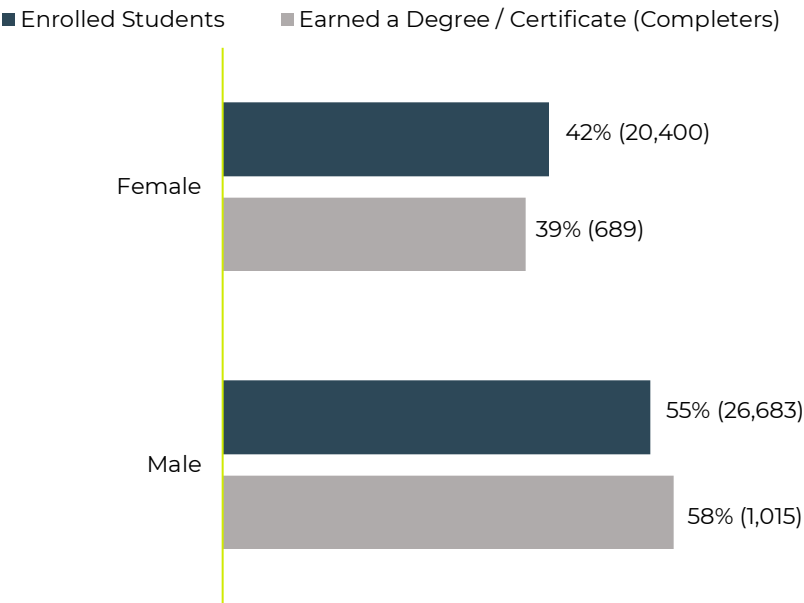
Source: Integrated Postsecondary Education Data System (IPEDS). Program Years 2020-21 to 2022-23 Annual Awards, by CIP Code, Bay Region Non-Community College Institutions.

Demographic Profile of Students in Community College ICT/Digital Media Programs

This sector profile also summarizes the demographics of community college students who enroll in and complete a degree or certificate in ICT/digital media programs. Figures 5 through 7 present data on students by gender, race/ethnicity, and age. Enrolled students include all general admit students² who were enrolled in at least one term of the selected year at a Bay Region community college. In terms of earned a degree or certificate attainment, it represents the number of students who earned one or more of the following: Chancellor’s Office approved certificate, associate degree, or non-credit awards.

On average, male students comprised 55% of enrollees and 58% of award earners, compared to 42% and 39% of female students, respectively. Students who identified as Hispanic (31%), White (23%) and Asian (23%) represented the three largest racial/ethnic groups among enrolled students, while students who identified as Hispanic and White were the largest groups that earned degrees (29% and 27% respectively). Students aged 20 to 24 were the most represented age group among those who enrolled (31%), and students aged 35 to 39 were the least represented age group among those who enrolled (6%). The figures below provide greater detail on the demographic profiles of students who enrolled in and completed ICT/digital media programs in the Bay Region.

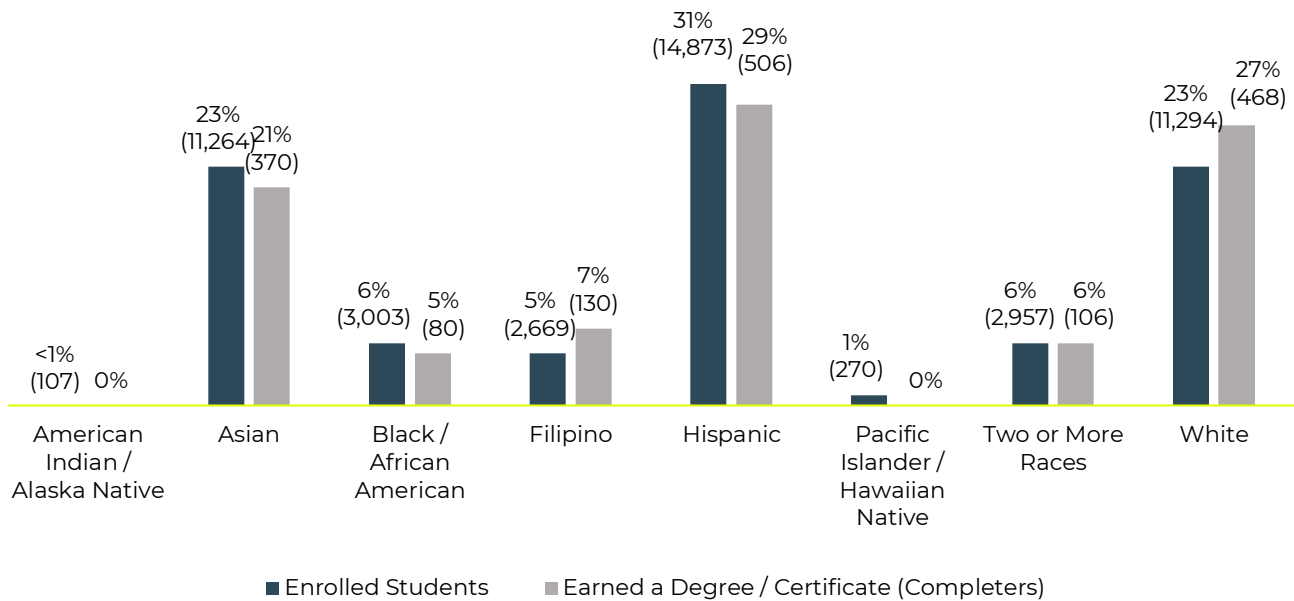
Figure 5: Gender of Students in ICT/Digital Media Programs in the Bay Region (2021-22 to 2023-24)



Note: May not total 100 percent due to non-respondent/non-binary.
Source: DataVista, Program Years 2021-22 to 2023-24 Programs, Bay Region Community Colleges.

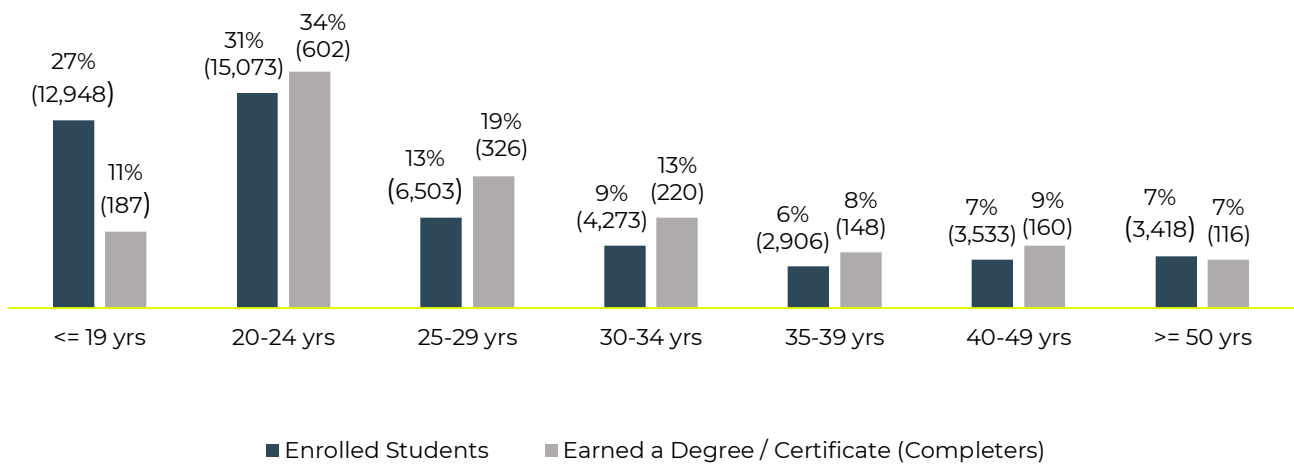
² This term was updated in DataVista from “non-special admit students” used in previous reports. General admit students are defined as all students who enrolled as first-time in higher education general admit credit students in at least one primary term of the selected year with a minimal credit enrollment at the selected college who are tracked for one, two, three, four and six years from first term of enrollment.
<https://datavista.cccco.edu/metrics/126>

Figure 6: Race/Ethnicity of Students in ICT/Digital Media Programs in the Bay Region (2021-22 to 2023-24)



Note: May not total 100 percent due to non-respondent/unknown/masked values.
Source: DataVista, Program Years 2021-22 to 2023-24 Programs, Bay Region Community Colleges.

Figure 7: Ages of Students in ICT/Digital Media Programs in the Bay Region (2021-22 to 2023-24)



Note: May not total 100 percent due to non-respondent/unknown/masked values.
Source: DataVista, Program Years 2021-22 to 2023-24 Programs, Bay Region Community Colleges.

Beyond Labor Market and Supply Data: Insights and Ideas to Inspire Action

Over the last decade, regional employment in the ICT/digital media sector has experienced both growth and decline, with employment patterns varying by career pathway. As shown in this sector profile (Figure 3), the networks, computer systems, and cybersecurity pathway has been steadily declining since 2020, but projections suggest a potential 7% growth by 2028 (Table 3). Similarly, growth in the communications, information, and support services pathway is projected to remain stagnant with no expected job changes through 2028, while the web development and digital design pathway is projected to show a modest increase of 2% (Table 3). These forecasts, however, partially rely on historical trends, and may not fully capture the pace of technological and economic changes in this sector in the Bay Region.

In 2024, major employers in the Bay Region such as Google, Apple, Meta, and Disney have reduced their workforce, with employment down 16% since the 2022 peak.³ These projections reflect online job postings trends, which showed a decrease in online job postings for all career pathways since 2022 (Figure 3). Even more recent projections suggest that these layoffs will continue through 2025, potentially further weighing on regional employment after an already significant reduction earlier in the year.⁴ Numerous fields in this sector impacted by these cuts include software engineering, computer programming, film and production, and analysts, to name a few. Economists point to the rapid acceleration of artificial intelligence (AI) as a central factor affecting these roles.⁵ For occupations such as software engineers and computer programmers, AI has automated manual coding tasks, which increases efficiency while simultaneously reducing the demand for human labor. While AI has contributed to layoffs in some segments, other analysts view it as a driver for new opportunities and innovation that may fuel economic recovery across the Bay Region, though the future of these outcomes remains uncertain.⁶

The communications, information, and support services pathway within this sector has also experienced disruptions over the last few years. The *Otis College Creative Economy Report* found that entertainment employment has fallen below its 2022 peak, with San Francisco leading statewide job losses.⁷ Analysts view 2022 as a peak television boom driven by streaming platforms expanding content production in an attempt to increase subscribers during the earlier years of the pandemic. Since then, the exponential increase in demand for shows has slowed, and job losses in this segment of the sector were exacerbated by the Hollywood writers' and actors' strikes in 2023.⁸ In addition, recent federal budget cuts in public media funding following the collapse of the

³ Levi Sumagaysay, "California's 'weak' job market propped up by public money as private sector sheds jobs," CalMatters, July 9, 2024, accessed September 1, 2025, <https://calmatters.org/economy/2024/07/california-labor-market-jobs>.

⁴ "Job Cuts Hammer Bay Area Tech Sector in Brutal Beginning for 2025," Industry Insider, April 2025, accessed September 1, 2025, <https://insider.govtech.com/california/news/job-cuts-hammer-bay-area-tech-sector-in-brutal-beginning-for-2025>.

⁵ "AI is Already Affecting the Labor Markets," California Economic Forecast, July 2024, accessed September 1, 2025, <https://californiaforecast.com/july-2025/>.

⁶ "Silicon Valley's 2025 Outlook: Challenges Persist Amidst AI-Driven Resurgence," Bay Area Council Economic Institution, January 6, 2025, accessed September 1, 2025, <https://www.bayareaeconomy.org/files/pdf/SiliconValley2025Outlook-TimesOfIndia-SR.pdf>.

⁷ "Otis College Report on the Creative Economy," Otis College of Art and Design, March 27, 2025, accessed September 1, 2025, https://www.otis.edu/about/initiatives/documents/25-063-creative_economy_report4_250411.pdf.

⁸ "Hollywood Restructuring and the Writers and Actors Strikes of 2023," UCLA Anderson Forecast, March 12, 2024, accessed September 1, 2025, <https://www.anderson.ucla.edu/news-and-events/hollywood-restructuring-and-writers-and-actors-strikes-2023>.

Corporation for Public Broadcasting have forced staffing reductions and program closures across California.⁹ Among the occupations most affected include broadcast announcers and radio disc jockeys, with employment for this occupation in the Bay Region projected to decline by 11% through 2028 (Table 3).

Despite these setbacks, California remains at the forefront of the evolving information and digital economy, particularly in terms of AI.¹⁰ The Bay Area Council Economic Institute projects that while AI has displaced some roles, its broader potential for innovative technologies could also play a key role in the economic recovery of the Bay Region.¹¹ Overall, these findings highlight the importance of considering broader dynamics that impact and shape this rapidly evolving industry.

⁹ "Layoffs Hit S.F.'s KDFC As Federal Public Broadcasting Funds Slashed," San Francisco Chronicle, August 29, 2025, accessed September 1, 2025, <https://www.sfchronicle.com/entertainment/article/kdfc-kusc-layoffs-trump-21022250.php>.

¹⁰ "New Research Shows the Bay Area Continues to Pioneer the AI Job Market," Silicon Valley Leadership Group, April 26, 2024, accessed September 1, 2025, <https://www.svlq.org/new-research-shows-the-bay-area-continues-to-pioneer-the-ai-job-market/>.

¹¹ "Democratize AI: How the AI Tide Can Lift More Boats," Bay Area Council Economic Institution, February 25, 2024, accessed September 1, 2025, <https://www.bayareaeconomy.org/democratize-ai-sf-ca-sfbt-sr/>.

Appendix A: Methodology

The Bay Region COE selected the occupations in this profile by examining job descriptions and skills listed in O*Net. Labor market and job postings data was sourced from Lightcast [data 2025.1]. Online job postings included all unique job postings from January 2024 to December 2024, and partial data through September 2025, in the 12-county Bay Region for occupations in the ICT/digital media pathway specified in this report. To evaluate industry data, the ICT/digital media sector included industries classified under North American Industry Classification System (NAICS) six-digit codes in Table 11. The COE selected these NAICS codes using inverse staffing patterns to determine the industries in which the occupations in this report were employed, and included industries related to ICT/digital media.

Table 11: NAICS codes for the ICT/Digital Media Sector

NAICS	Description
323111	Commercial Printing (except Screen and Books)
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing
423430	Computer and Computer Peripheral Equipment and Software Merchant Wholesalers
512110	Motion Picture and Video Production
512120	Motion Picture and Video Distribution
512131	Motion Picture Theaters (except Drive-Ins)
512132	Drive-In Motion Picture Theaters
512191	Teleproduction and Other Postproduction Services
512199	Other Motion Picture and Video Industries
512230	Music Publishers
512240	Sound Recording Studios
512250	Record Production and Distribution
512290	Other Sound Recording Industries
513110	Newspaper Publishers
513120	Periodical Publishers
513130	Book Publishers
513199	All Other Publishers
513210	Software Publishers
516110	Radio Broadcasting Stations
516120	Television Broadcasting Stations
516210	Media Streaming Distribution Services, Social Networks, and Other Media Networks and Content Providers

NAICS	Description
517111	Wired Telecommunications Carriers
517112	Wireless Telecommunications Carriers (except Satellite)
517410	Satellite Telecommunications
517810	All Other Telecommunications
518210	Data Processing, Hosting, and Related Services
519290	Web Search Portals and All Other Information Services
541410	Interior Design Services
541420	Industrial Design Services
541430	Graphic Design Services
541490	Other Specialized Design Services
541511	Custom Computer Programming Services
541512	Computer Systems Design Services
541513	Computer Facilities Management Services
541519	Other Computer Related Services
541810	Advertising Agencies
541820	Public Relations Agencies
541890	Other Services Related to Advertising
541921	Photography Studios, Portrait
541922	Commercial Photography
541930	Translation and Interpretation Services
711110	Theater Companies and Dinner Theaters
711310	Promoters of Performing Arts, Sports, and Similar Events with Facilities
711510	Independent Artists, Writers, and Performers

The Bay Region COE selected ICT/digital media programs based on DataVista's Mapping of Taxonomy of Program (TOP) Codes to Sectors.¹² To evaluate active or approved programs in Bay Region community colleges we examined data reported to the California Community Colleges Chancellor's Office Curriculum Inventory (COCI). This report included active or approved programs prior to October 2024. Educational supply data was retrieved from Data Mart for TOP data and Integrated Postsecondary Education Data System (IPEDS) for CIP data. The total number of degrees awarded for a given TOP or CIP code was calculated as a three-year average.

¹² <https://datavista.cccco.edu/resources/16>.

Definitions

Average Annual Job Openings: In Lightcast, average annual job openings refer to the estimated number of job openings in a given occupation or group of occupations within a specific geographic area during the course of a year. When calculating this metric for more than a year, the average across those years is determined by adding the annual job openings over the period and dividing the total by the number of years (e.g., for a five-year period, this means adding the total openings across those five years and dividing that number by 5).

This metric is calculated based on:

- New Growth: Openings that arise due to the creation of new jobs as a result of industry or economic growth.
- Replacement Needs: Openings that occur because of workers leaving the occupation (e.g., due to retirement, career changes, or other factors).

Together, these components provide a comprehensive view of the total demand for workers in a specific role or field each year.

Average Annual Replacement Jobs: Average annual projected number of replacement job openings during 2023-2028.

CIP code: The Classification of Instructional Programs (CIP) is a taxonomic coding scheme, developed by the U.S. Department of Education's National Center for Education Statistics (NCES), used to classify and categorize academic programs for federal surveys and reporting of institutional data. Program data from CIP codes comes from the Integrated Postsecondary Education Data System (IPEDS). CIP codes are used to facilitate the alignment of similar programs offered by 2- and 4-year postsecondary institutions with the needs of the labor market.

Living wage: The living wage is the hourly rate that an individual in a household must earn to support themselves and/or their family, working full-time, or 2,080 hours per year. In the Bay Region the living wage is calculated as \$46 per hour for one adult and school-aged child using the average median wages across the 12 counties in the Bay Region (Table 12).¹³

Table 12. Living Wage for an Adult + School-Aged Child by County

County	Living Wage	County	Living Wage
Alameda County	\$46	San Francisco County	\$50
Contra Costa County	\$46	San Mateo County	\$57
Marin County	\$55	Santa Clara County	\$51
Monterey County	\$44	Santa Cruz County	\$59
Napa County	\$44	Solano County	\$39
San Benito County	\$42	Sonoma County	\$42

¹³ "Self-Sufficiency Standard," Center for Women's Welfare, University of Washington, 2023, accessed May 9, 2025, <https://selfsufficiencystandard.org/California/>.

NAICS codes: North American Industry Classification System (NAICS) codes are used to organize and categorize industries within the job market for this sector. A single two-digit NAICS code can represent multiple sub-sectors and industry groups within the broader sector.

Replacements as a Percentage of Openings: Percentage of replacements across all job openings during 2023-2028.

Skill Level: Occupations are categorized into three skill levels: below middle-skill, middle-skill, and above middle-skill jobs. Classification is based on the typical entry-level education below.

Table 13. Skill Level Definition

Skill Level	Entry-Level Education
Below Middle-Skill	No formal education required
	High school diploma
Middle-Skill	Some college, no award
	Postsecondary certificate (non-degree award)
	Associate degree
	Bachelor's degree (selected occupations where ~33% or greater of positions are held by workers with less than a bachelor's degree)
Above Middle-Skill	Bachelor's degree (All other occupations not identified as middle-skill)
	Advanced degree

TOP code: The Taxonomy of Programs (TOP) is a system of codes used by the California Community College Chancellor's Office to compare differently named academic programs with similar outcomes across community colleges. Programs and courses offered by Community Colleges are assigned a TOP code to identify similar programs and their alignment with the labor market.

Unique Job Postings: Lightcast's deduplication process identifies duplicate job postings and counts them as a unique posting. The unique job posting count is the number of postings after the deduplication process has taken place. For example, multiple postings could list the same job, from the same company, and in the same region, and these multiple postings would be reduced to one unique job posting.

Sources

- California Community Colleges Chancellor's Office Curriculum Inventory (COCI)
- Chancellor's Office Management Information Systems (MIS) Data Mart
- DataVista
- Integrated Postsecondary Education Data System (IPEDS)
- Lightcast
- O*Net Online

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The Bay Region COE would also like to acknowledge the expertise and support of Priscilla Fernandez, Independent Research Consultant, in the development of this report.



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