Information and Communication Technologies – Digital Media (ICT-DM)
Regional Advisory

Friday, November 6, 2020
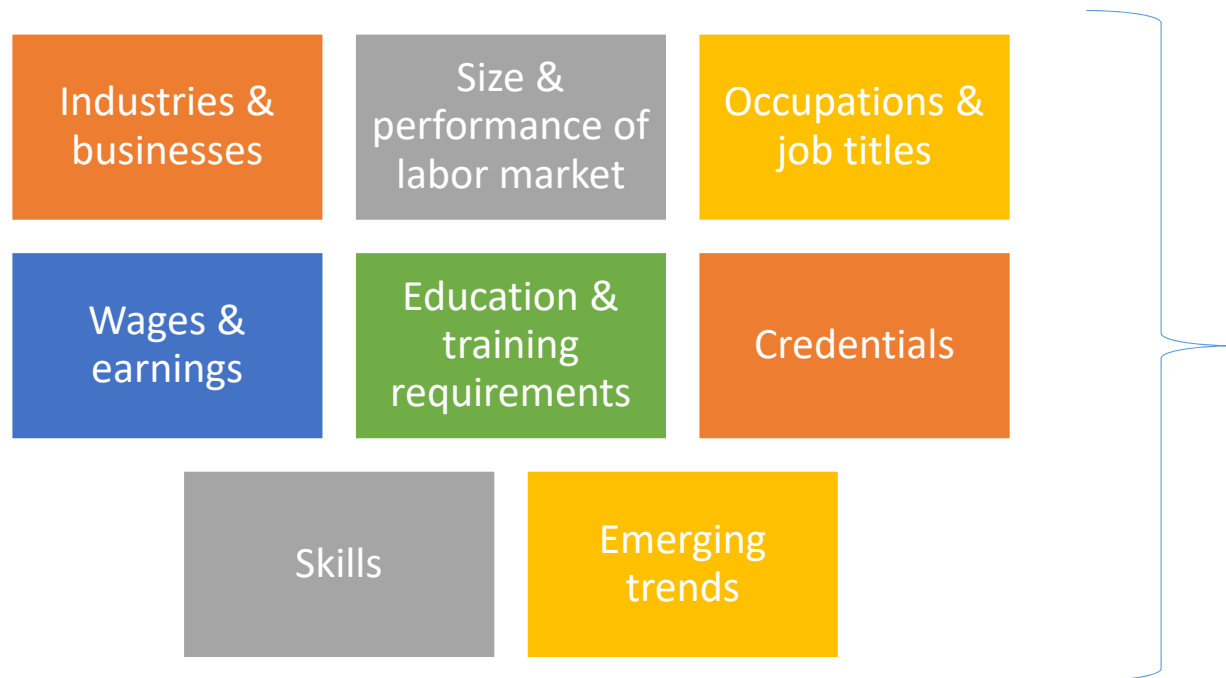
Who is the Center of Excellence?
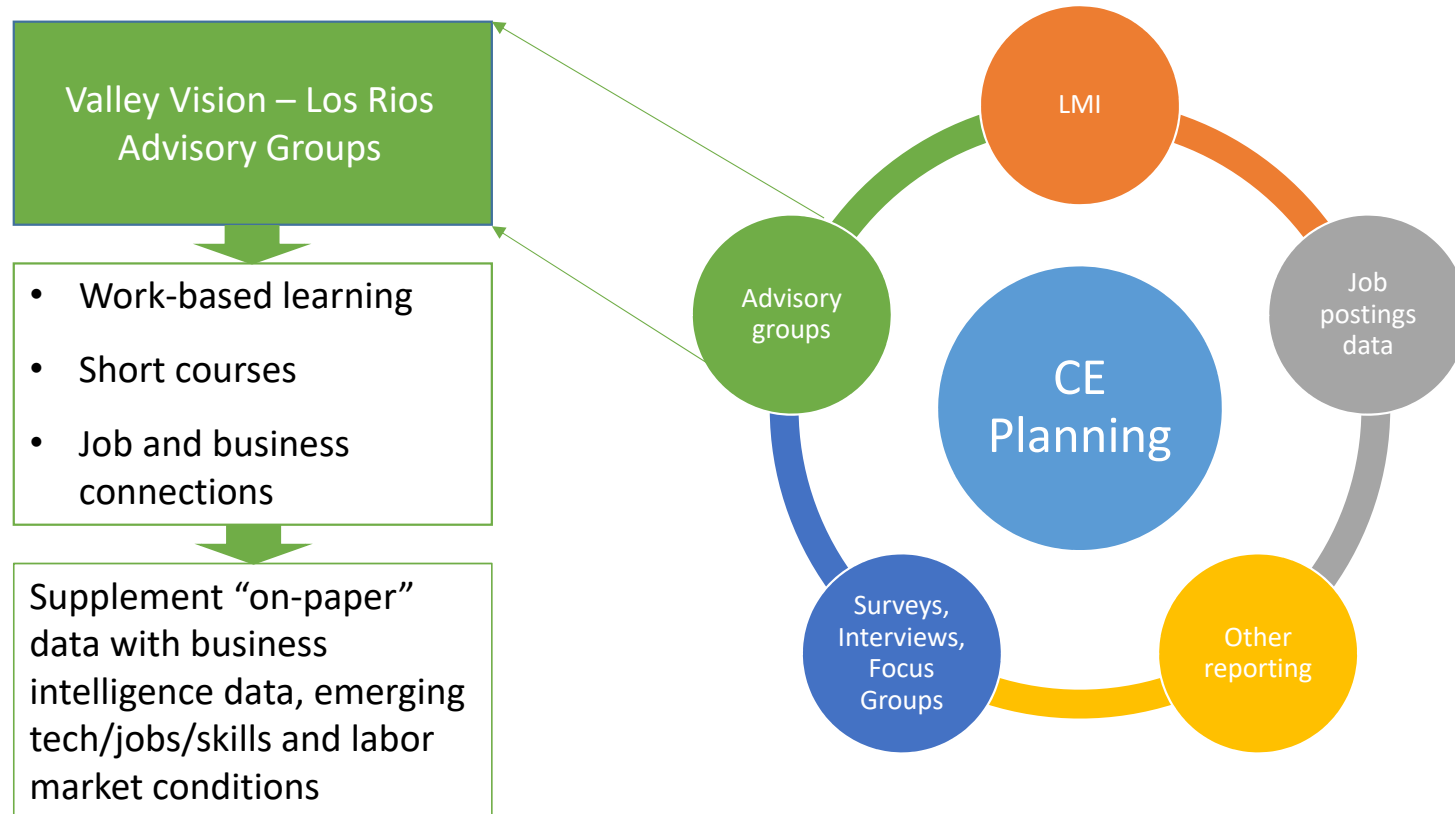

Region	Director
North/ Far North	Aaron Wilcher (North)
	Sara Phillips (Far North)
Bay Area	John Carrese
Central	Nora Seronello
South Central	Adele Hermann
Los Angeles	Luke Meyer
Orange County	Jesse Crete
Inland Empire/Desert	Michael Goss
San Diego/Imperial	Tina Ngo Bartel
Statewide	Laura Coleman

Typical COE Research Questions

Industries & businesses	Size & performance of labor market	Occupations & job titles
Wages & earnings	Education & training requirements	Credentials
	Skills	Emerging trends

- What is the employment **outlook** for students?

- What **skills** and **credentials** are needed?
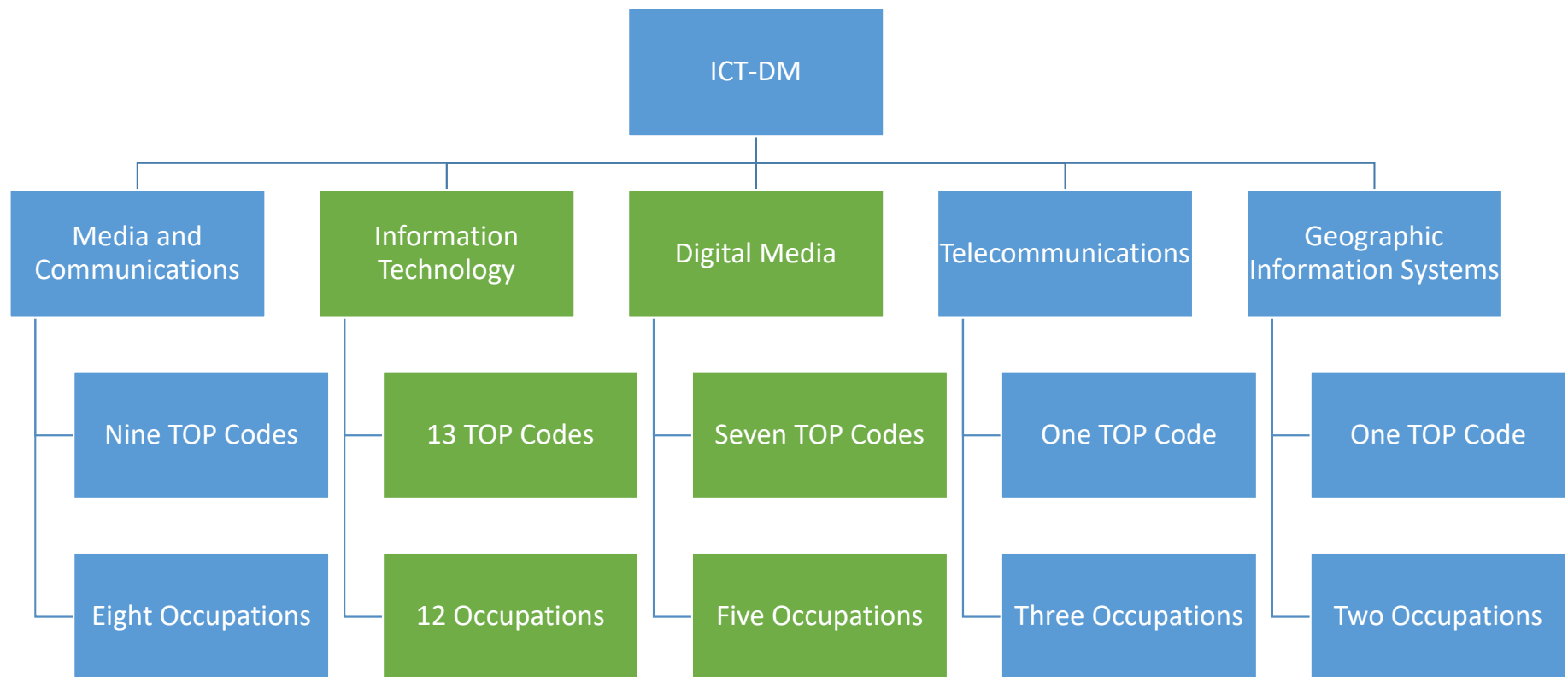
- What **programs** look ripe for investment?

"Mixed Methods Process" for planning

Valley Vision – Los Rios Advisory Groups

- Work-based learning
- Short courses
- Job and business connections

Supplement "on-paper" data with business intelligence data, emerging tech/jobs/skills and labor market conditions

LMI

Job postings data

CE Planning

Advisory groups

Surveys, Interviews, Focus Groups

Other reporting

Presentation Overview

- ICT-DM Sector Definition
- Occupation overview
- Job postings data
- College programs and awards

ICT-DM

Media and Communications
- Nine TOP Codes
- Eight Occupations

Information Technology
- 13 TOP Codes
- 12 Occupations

Digital Media
- Seven TOP Codes
- Five Occupations

Telecommunications
- One TOP Code
- Three Occupations

Geographic Information Systems
- One TOP Code
- Two Occupations

Source: COE DWM Sectors to TOP codes and TOP-to-CIP-to-SOC crosswalks

ICT-DM Employment at a Glance

44,964 Jobs in 2019	**47,179** Projected Jobs in 2024	**5%** Projected Job Growth

4,354 Annual Openings, 2019-2024	**$38.56** Avg. Median Hourly Earnings

Occupation	2019 Jobs	2024 Jobs	2019 - 2024 Projected % Change	Annual Openings	Annual Replacement Rate	Median Hourly Earnings
Computer User Support Specialists	12,216	12,629	3%	1,100	8.2%	$33.83
Project Management Specialists and Business Operations Specialists, All Other	11,388	12,015	6%	1,245	9.6%	$34.83
Software Developers and Software Quality Assurance Analysts and Testers	7,983	8,690	9%	785	7.8%	$54.19
Computer Systems Analysts	3,253	3,386	4%	266	7.2%	$46.72
Network and Computer Systems Administrators	1,762	1,841	4%	142	7.0%	$44.44
Graphic Designers	1,720	1,782	4%	188	10.0%	$26.01
Computer Programmers	1,215	1,182	(3%)	85	7.0%	$38.56
Data Entry Keyers	1,191	1,099	(8%)	134	11.5%	$17.36
Computer Network Support Specialists	1,086	1,150	6%	104	8.2%	$33.32
Web Developers and Digital Interface Designers	1,005	1,104	10%	100	7.6%	$31.84
Computer Network Architects	656	684	4%	53	7.0%	$56.03
Database Administrators and Architects	635	678	7%	55	7.1%	$53.85
Information Security Analysts	454	530	17%	50	7.1%	$55.93
Special Effects Artists and Animators	341	356	4%	41	10.9%	$21.53
Desktop Publishers	59	52	(12%)	7	11.6%	$29.96
North (Greater Sacramento) Totals	44,964	47,179	5%	4,354	--	$38.56

Source: Emsi 2020.4; QCEW Employees, Non-QCEW Employees, and Self-Employed in the seven-county North (Greater Sacramento) region, which includes El Dorado, Nevada, Placer, Sacramento, Sutter, Yolo, and Yuba.
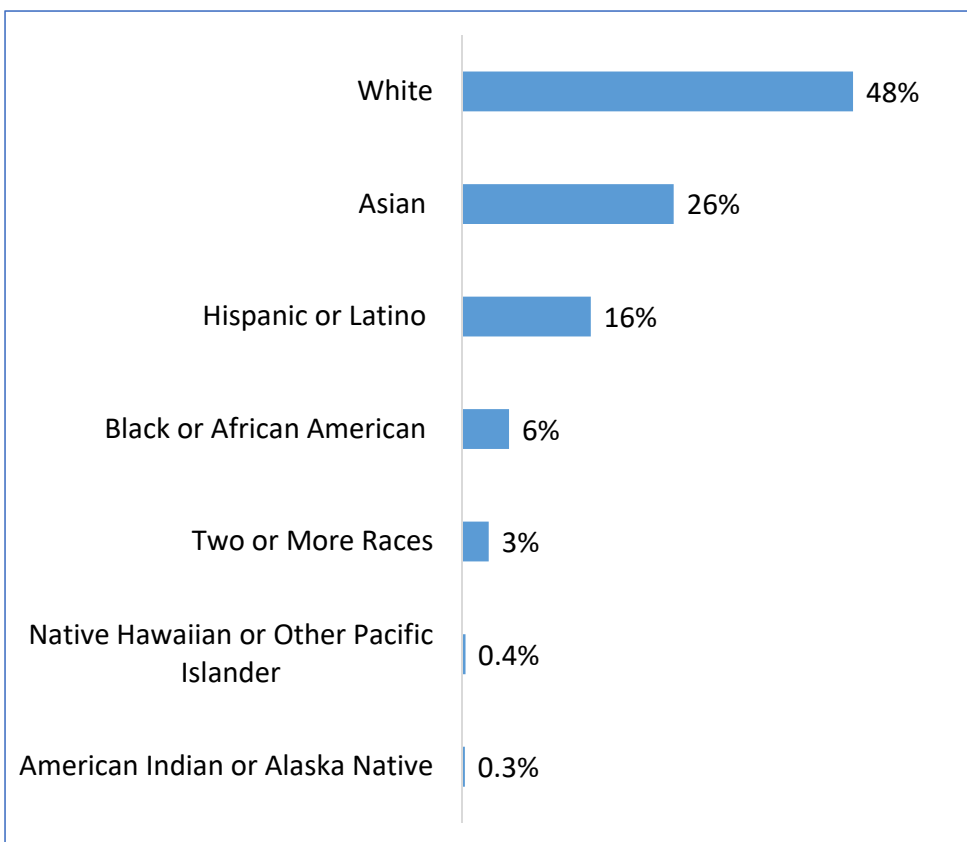
These ICTDM Occupations work in many industries...
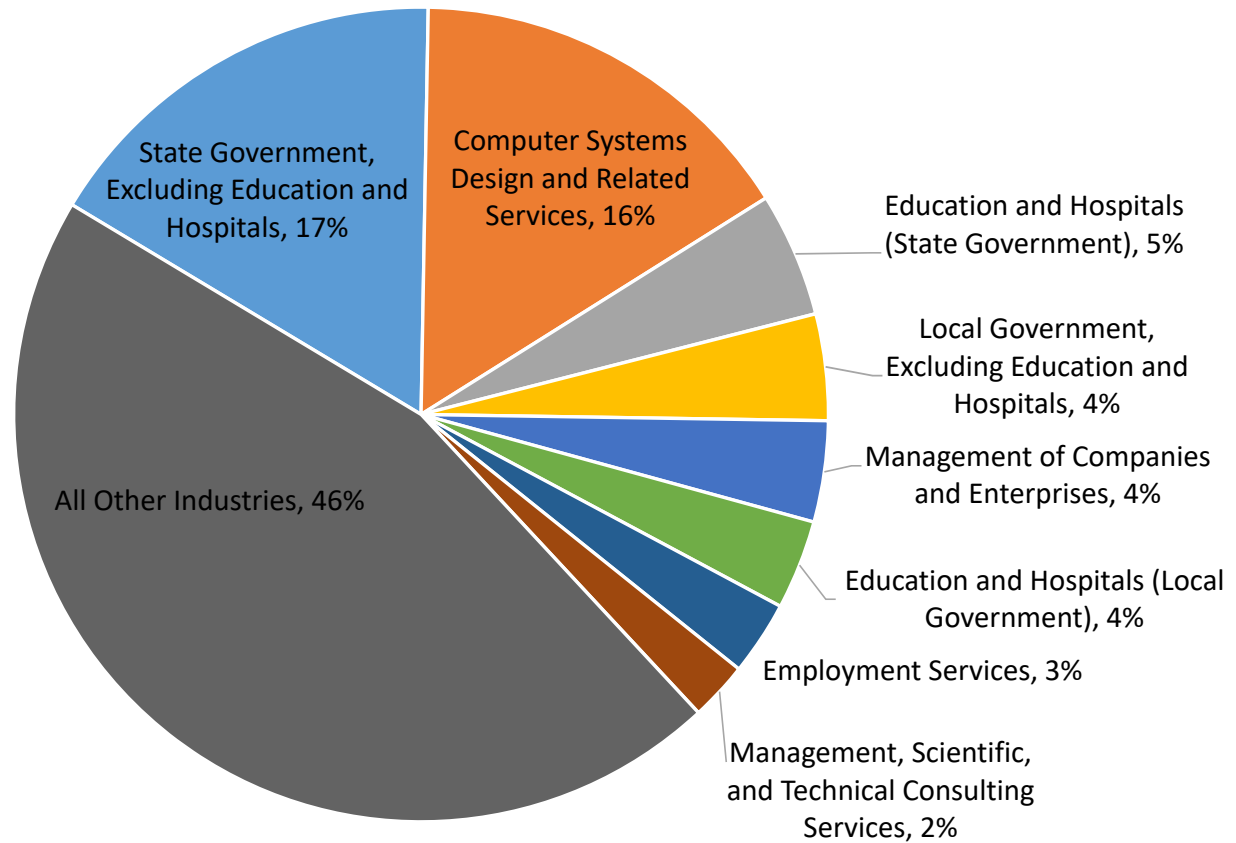
Pie chart segments:
- State Government, Excluding Education and Hospitals, 17%
- Computer Systems Design and Related Services, 16%
- Education and Hospitals (State Government), 5%
- Local Government, Excluding Education and Hospitals, 4%
- Management of Companies and Enterprises, 4%
- Education and Hospitals (Local Government), 4%
- Employment Services, 3%
- Management, Scientific, and Technical Consulting Services, 2%
- All Other Industries, 46%

Source: Emsi 2020.4; QCEW Employees, Non-QCEW Employees, and Self-Employed in the seven-county North (Greater Sacramento) region, which includes El Dorado, Nevada, Placer, Sacramento, Sutter, Yolo, and Yuba.

ICT-DM Work Force Demographics (2019)

Racial/ethnic demographics:
- White: 48%
- Asian: 26%
- Hispanic or Latino: 16%
- Black or African American: 6%
- Two or More Races: 3%
- Native Hawaiian or Other Pacific Islander: 0.4%
- American Indian or Alaska Native: 0.3%

Age demographics:
- 14-18: 0.3%
- 19-21: 2%
- 22-24: 4%
- 25-34: 25%
- 35-44: 27%
- 45-54: 22%
- 55-64: 16%
- 65+: 4%

Gender:
- Female, 39%
- Male, 61%

Source: Emsi 2020.4; QCEW Employees, Non-QCEW Employees, and Self-Employed. 7-county North (Greater Sacramento) region.
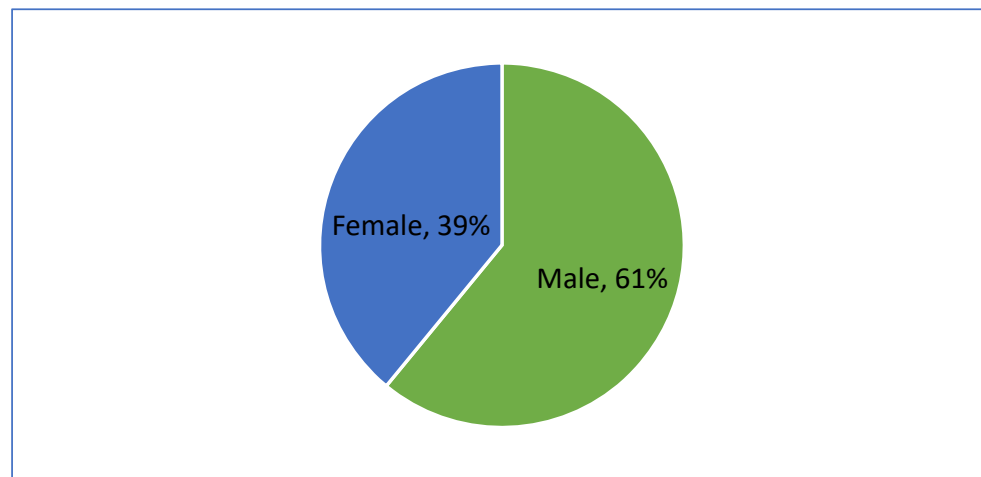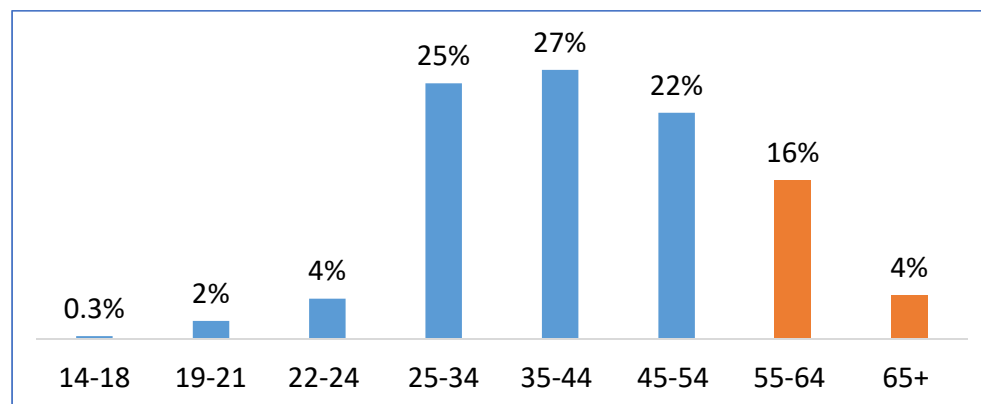
Burning Glass Job Postings

About Burning Glass Labor Insights

- Online job posting aggregator
- New jobs posted online between November 1, 2019 through October 31, 2020
- Searched for 16 occupations (see slide #24)
- Focused on jobs that required training beyond HS diploma
- Number of job postings vary by occupation, as do the number of unspecified job postings

Job Postings by Occupation

SOC Code	Occupation	Job Postings	Share of Job Postings
15-1132	Software Developers, Applications	7,356	29.5%
15-1199	Computer Occupations, All Other	6,456	25.9%
15-1151	Computer User Support Specialists	2,443	9.8%
15-1121	Computer Systems Analysts	1,678	6.7%
15-1134	Web Developers	1,579	6.3%
15-1141	Database Administrators	1,027	4.1%
15-1122	Information Security Analysts	908	3.6%
15-1142	Network and Computer Systems Administrators	868	3.5%
43-9021	Data Entry Keyers	748	3.0%
15-1131	Computer Programmers	676	2.7%
15-1143	Computer Network Architects	649	2.6%
27-1024	Graphic Designers	277	1.1%
15-1152	Computer Network Support Specialists	179	0.7%
15-1133	Software Developers, Systems Software	73	0.3%
27-1014	Multimedia Artists and Animators	39	0.2%
43-9031	Desktop Publishers	13	0.1%
	North (Greater Sacramento) Totals	**24,969**	**100.0%**

"Data Scientists" among these job postings...

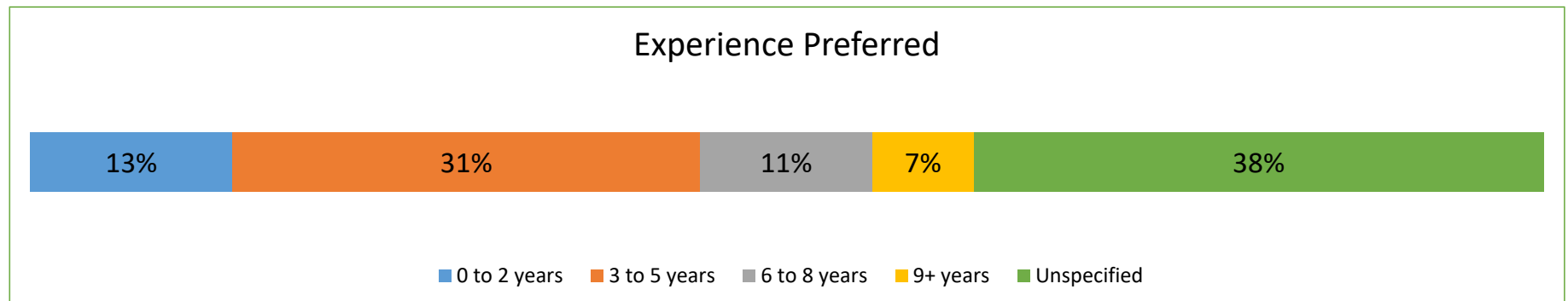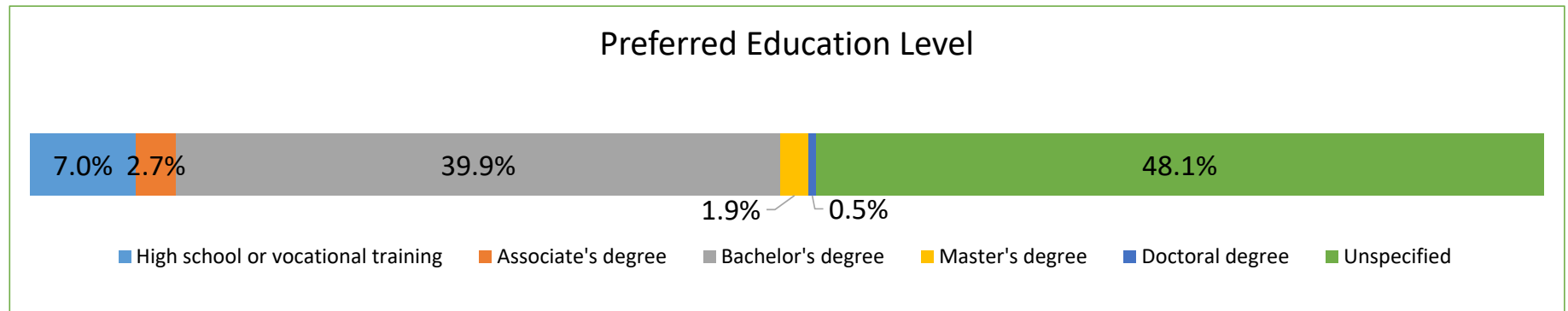| Employers with most job openings	Job Titles	Most In-Demand Specialized Skills	Aligned Occupations
• Genentech (5 postings) • Intel (1) • Guidehouse (1) • Blue Cross Blue Shield of California (1) • Agility Solutions (1) • Unspecified (1)	• Senior Principal Data Scientist – Platform Applications Development, Personalized Healthcare (3) • Quantitative Analyst/Data Scientist – Opower Product Team (1) • Principal Data Scientist – Platform Applications Development, Personalized Healthcare (1) • Genentech Principal Data Scientist – Platform Applications Development, Personalized Healthcare (1) • Data Scientist/Big Data Engineer (1) • Data Scientist, Senior Consultant (1) • Data Scientist, Consultant (1) • Data Integrator, Data Scientist (1)	• Data Science (10) • Data Transformation (8) • Economics (7) • Strategic Planning (5) • Public Health and Safety (5) • Psychology (5) • Patient Care (5) • Genomics (5) • Epidemiology (5) • Clinical Trials (5)	• Software Developers, Applications (6) • Computer Occupations, All Other (2) • Database Administrators (1) • Computer Systems Analysts (1)

Top Locations and Employers

City	Job Postings
Sacramento, CA	13,563
Rancho Cordova, CA	2,361
Folsom, CA	1,319
Roseville, CA	1,233
El Dorado Hills, CA	815
Elk Grove, CA	802
Davis, CA	736
Rocklin, CA	664
West Sacramento, CA	518
Woodland, CA	458
Mcclellan, CA	213
Beale Afb, CA	182
Auburn, CA	139
Citrus Heights, CA	98
Esparto, CA	86

Employer	Job Postings
Anthem Blue Cross	416
Centene Corporation	389
Deloitte	315
Blue Cross Blue Shield of California	279
University California	225
Accenture	203
University California Davis	129
Zeektek	127
Amazon	125
Northrop Grumman	116
PricewaterhouseCoopers	113
Travelers	105
Intel Corporation	97
UC Davis Health	87
Key Business Solutions Incorporated	82

Burning Glass Labor Insights
- Locations and employers with the most job postings, seven-county North (Greater Sacramento) subregion
- Nov 1, 2019 – Oct 31, 2020
- 16 ICTDM Occupations (2010 SOCs), n=24,969 postings; 7,468 unspecified postings for employers, zero for location

Most Requested Education and Experience

Preferred Education Level

| 7.0% | 2.7% | 39.9% | 1.9% | 0.5% | 48.1% |

- ■ High school or vocational training
- ■ Associate's degree
- ■ Bachelor's degree
- ■ Master's degree
- ■ Doctoral degree
- ■ Unspecified

Experience Preferred

| 13% | 31% | 11% | 7% | 38% |

- ■ 0 to 2 years
- ■ 3 to 5 years
- ■ 6 to 8 years
- ■ 9+ years
- ■ Unspecified

Burning Glass Labor Insights
- Education and experience in greatest demand, seven-county North (Greater Sacramento)
- Nov 1, 2019 – Oct 30, 2020

Hard-to-fill Jobs in Greater Sacramento

Occupation	Number of Job Postings	Time to Fill	Location Quotient
Data Warehousing Specialists	167 (Medium)	54 Days (Much Harder)	0.8 (Low)

Employers
- Anthem Blue Cross
- Centene Corporation
- Deloitte
- Blue Cross Blue Shield of California
- University of California
- Accenture
- Zeektek
- Amazon

Most Requested Skills
- SQL
- Java
- JavaScript
- Project Management
- Software Development
- Software Engineering
- Customer Service
- Oracle

Training Providers in North (Greater Sacramento)

Community Colleges	Bachelor-Granting Institutions	Other Postsecondary Training Providers
• American River • Cosumnes River • Folsom Lake • Lake Tahoe • Sacramento City • Sierra • Yuba	• CSU Sacramento • UC Davis • William Jessup University	• Charles A Jones • CET Sacramento • MTI College • University of Phoenix • Asher College

Average Annual Awards, 2016-17 through 2018-19

Computer Information Systems-0702
- ARC: 5
- CRC: 12
- FLC: 0
- SCC: 13
- Sierra: 14

Computer Infrastructure and Support-0708
- ARC: 47
- CRC: 16
- SCC: 60
- Sierra: 66

Computer Software Development-0707
- ARC: 39
- CRC: 36
- FLC: 12
- SCC: 24
- Sierra: 26
- Yuba: 9

Average Annual Awards,
2016-17 through 2018-19

	Digital Media-0614				World Wide Web Administration-0709	Information Technology, General-0701	Other Information Technology-0799
34	5	2	38	22	6	4	3
ARC	CRC	LTCC	SCC	Sierra	ARC	CRC	Sierra
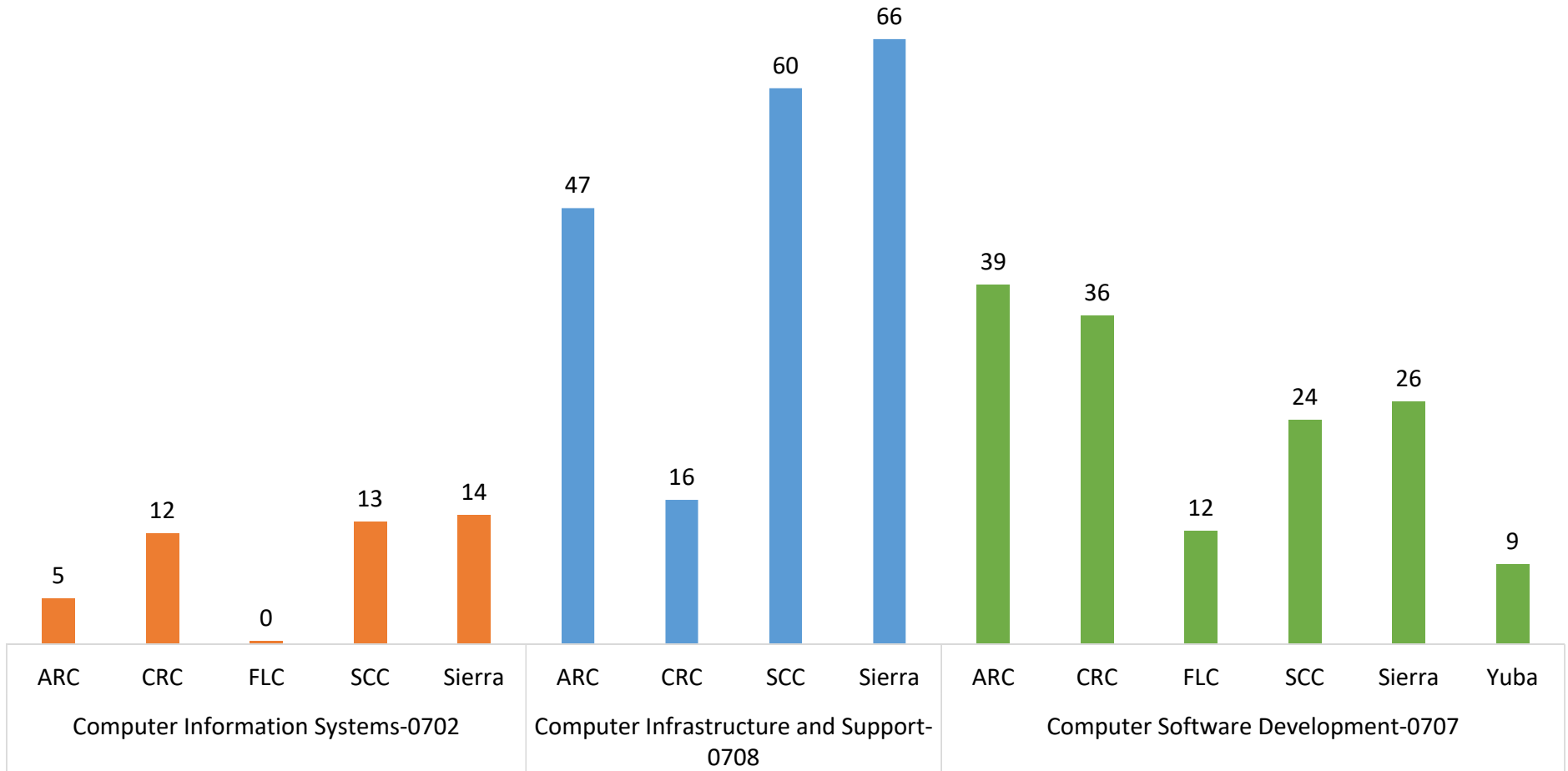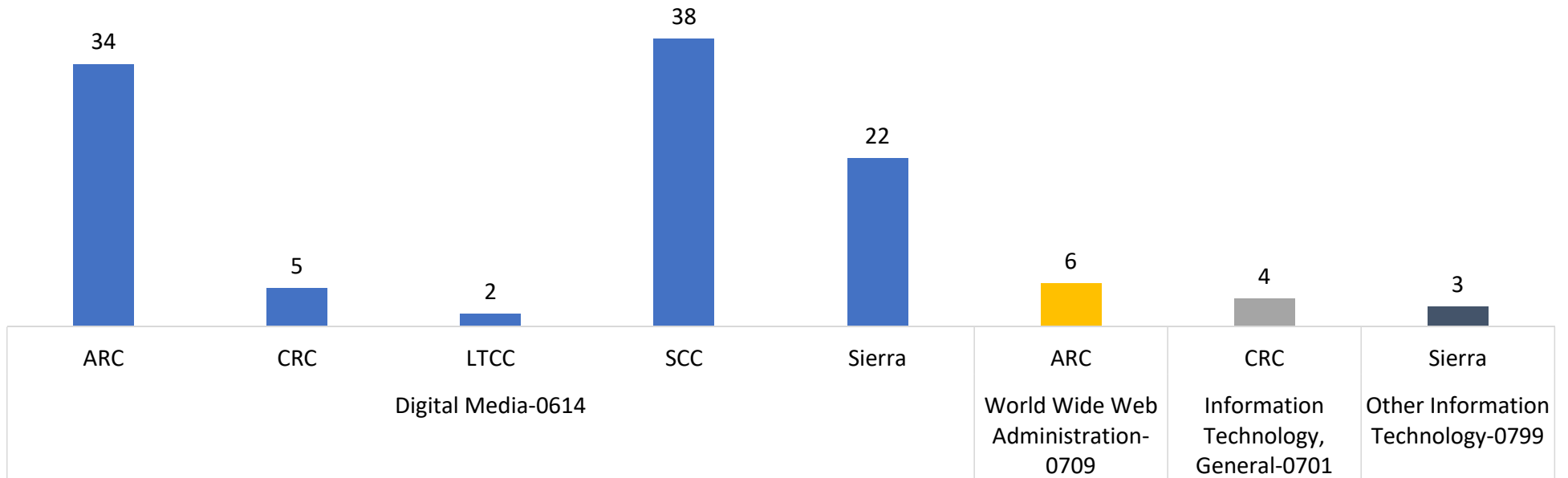
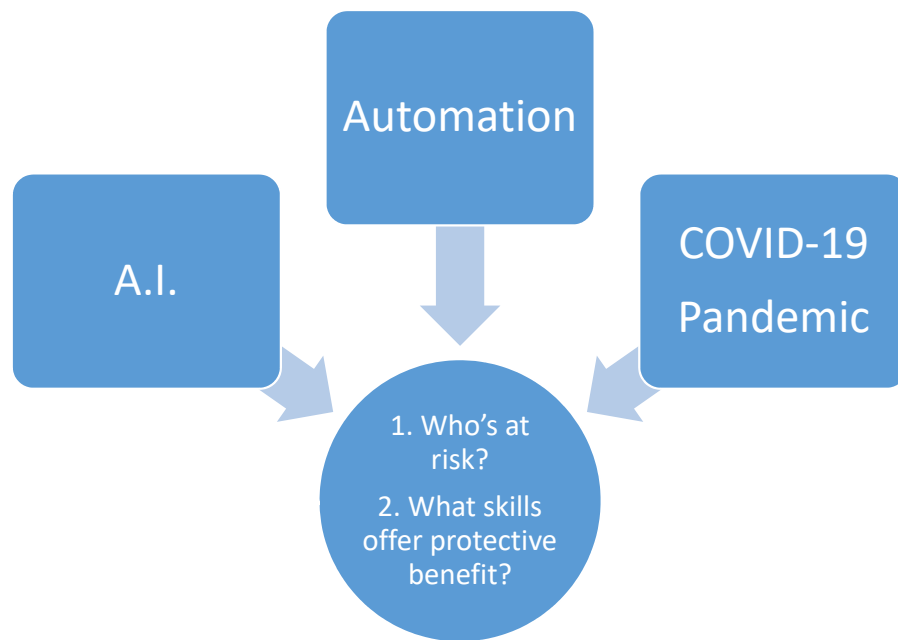| Program – TOP4	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Average
Computer Information Systems-0702	ARC	5	5	5	5
	CRC	9	14	13	12
	FLC	1	0	0	0
	SCC	12	13	15	13
	Sierra	12	16	14	14
Computer Infrastructure and Support-0708	ARC	43	44	55	47
	CRC	17	21	9	16
	SCC	66	60	55	60
	Sierra	51	76	70	66
Computer Software Development-0707	ARC	39	31	47	39
	CRC	24	50	33	36
	FLC	10	8	19	12
	SCC	19	31	23	24
	Sierra	21	23	35	26
	Yuba	6	5	15	9
Digital Media-0614	ARC	35	32	36	34
	CRC	3	6	6	5
	LTCC	1	1	3	2
	SCC	45	26	42	38
	Sierra	12	19	35	22
World Wide Web Administration-0709	ARC	7	5	5	6
Information Technology, General-0701	CRC	0	3	8	4
Other Information Technology-0799	Sierra	4	2	2	3
	Grand Total	*442*	*491*	*545*	*493*

Source: Management Information Systems (MIS) Data Mart, California Community Colleges Chancellor's Office, accessed October 29, 2020, https://datamart.cccco.edu/.

Average Annual Awards,
2016-17 through 2018-19

Award Type	Value
Associate of Science (A.S.) degree	210
Associate of Arts (A.A.) degree	48
Certificate, 6 to < 18 units	56
Certificate, 12 to < 18 units	41
Certificate, 16 to < 30 units	5
Certificate, 18 to < 30 units	113
Certificate, 30 to < 60 units	20

Other Considerations

Automation

A.I.

COVID-19 Pandemic

1. Who's at risk?

2. What skills offer protective benefit?

- Future of work will require both Upskilling and Reskilling
- Consider context of ICTDM programs as they relate to other CE pathways
  - Where is there opportunity for cross-disciplinary work?
- Equity Gaps
  - Who's missing from programs?
  - Where is there opportunity to bridge the gap?

Thank you!

Ebony J. Benzing
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C·O·E

CENTERS OF EXCELLENCE
FOR LABOR MARKET RESEARCH

ICT-DM Aligned TOP Codes

Media and Communications		Digital Media		Information Technology		Geographic Information		Telecommunications	
060200	Journalism	061400	Digital Media	070100	Information Technology, General	220610	Geographic Information Systems	093430	Telecommunications Technology
060400	Radio and Television	061410	Multimedia	070200	Computer Information Systems				
060410	Radio	061420	Electronic Game Design	070210	Software Applications				
060420	Television (including combined TV/film/video)	061430	Website Design and Development	070700	Computer Software Development				
060430	Broadcast Journalism	061440	Animation	070710	Computer Programming				
060700	Technical Communication	061450	Desktop Publishing	070720	Database Design and Administration				
061000	Mass Communications	061460	Computer Graphics and Digital Imagery	070730	Computer Systems Analysis				
061220	Film Production			070800	Computer Infrastructure and Support				
069900	Other Media and Communications			070810	Computer Networking				
				070820	Computer Support				
				070900	World Wide Web Administration				
				070910	E-Commerce (technology emphasis)				
				079900	Other Information Technology				

ICT-DM Aligned Occupations (2010 SOC)

Media and Communications	Digital Media	Information Technology	Geographic Information	Telecommunications
27-2012 Producers and Directors	15-1134 Web Developers	15-1121 Computer Systems Analysts	15-1199 Computer Occupations, All Other	17-2072 Electronics Engineers, Except Computer
27-3011 Radio and Television Announcers	15-1199 Computer Occupations, All Other	15-1122 Information Security Analysts	17-3031 Surveying and Mapping Technicians	17-3023 Electrical and Electronic Engineering Technologists and Technicians
27-3021 Broadcast News Analysts	27-1014 Multimedia Artists and Animators	15-1131 Computer Programmers		49-2022 Telecommunications Equipment Installers and Repairers, Except Line Installers
27-3022 Reporters and Correspondents	27-1024 Graphic Designers	15-1132 Software Developers, Applications		
27-3041 Editors	43-9031 Desktop Publishers	15-1133 Software Developers, Systems Software		
27-3042 Technical Writers		15-1134 Web Developers		
27-3043 Writers and Authors		15-1141 Database Administrators		
27-4031 Camera Operators, Television, Video, and Motion Picture		15-1142 Network and Computer Systems Administrators		
27-4032 Film and Video Editors		15-1143 Computer Network Architects		
		15-1151 Computer User Support Specialists		
		15-1152 Computer Network Support Specialists		
		15-1199 Computer Occupations, All Other		
		43-9021 Data Entry Keyers		

ICT-DM Aligned Occupations (2018 SOC)

Media and Communications	Digital Media	Information Technology	Geographic Information	Telecommunications
27-2012 Producers and Directors	13-1082 Project Management Specialists	13-1082 Project Management Specialists	13-1082 Project Management Specialists	17-2072 Electronics Engineers, Except Computer
27-3011 Radio and Television Announcers	15-1254 Web Developers	15-1211 Computer Systems Analysts	17-3031 Surveying and Mapping Technicians	17-3023 Electrical and Electronic Engineering Technologists and Technicians
27-3021 Broadcast News Analysts	27-1014 Special Effects Artists and Animators	15-1212 Information Security Analysts		49-2022 Telecommunications Equipment Installers and Repairers, Except Line Installers
27-3022 Reporters and Correspondents	27-1024 Graphic Designers	15-1231 Computer Network Support Specialists		
27-3041 Editors	43-9031 Desktop Publishers	15-1232 Computer User Support Specialists		
27-3042 Technical Writers		15-1241 Computer Network Architects		
27-3043 Writers and Authors		15-1242 Database Administrators		
27-4031 Camera Operators, Television, Video, and Motion Picture		15-1243 Database Architects		
27-4032 Film and Video Editors		15-1244 Network and Computer Systems Administrators		
		15-1251 Computer Programmers		
		15-1252 Software Developers		
		15-1254 Web Developers		
		43-9021 Data Entry Keyers		

Data Sources

- Emsi. https://www.economicmodeling.com/. EMSI occupational employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors).

- "Labor Insight Real-Time Labor Market Information Tool." Burning Glass Technologies. http://www.burning-glass.com.

- "Taxonomy of Programs." California Community Colleges Chancellor's Office. June 2012, 6th Edition. https://www.cccco.edu/-/media/CCCCO-Website/About-Us/Divisions/Educational-Services-and-Support/Academic-Affairs/What-we-do/Curriculum-and-Instruction-Unit/Files/TOPmanual6200909corrected12513pdf.ashx.

- Management Information Systems (MIS) Data Mart. California Community Colleges Chancellor's Office. https://datamart.cccco.edu/.

- Integrated Postsecondary Education Data System (IPEDS). National Center for Education Statistics. U.S. Department of Education. https://nces.ed.gov/ipeds/.

- O*NET OnLine. U.S. Department of Labor/Employment and Training Administration (DOLETA). https://www.onetonline.org/.