



Education Report

Management Information Systems, General

California



Definition of Management Information Systems, General, CIP 52.1201 3
Awards..... 4
Occupation Crosswalk 5
Occupation Details 6
Employment by Industry 7
Geographic Distribution 8
Demographic Profile..... 9
RTI (Job Postings) 10
California Regional Map 15
FAQ..... 16

Definition of Management Information Systems, General, CIP 52.1201

A program that generally prepares individuals to provide and manage data systems and related facilities for processing and retrieving internal business information; select systems and train personnel; and respond to external data requests. Includes instruction in cost and accounting information systems, management control systems, personnel information systems, data storage and security, business systems networking, report preparation, computer facilities and equipment operation and maintenance, operator supervision and training, and management information systems policy and planning.

Awards

The table below is a list of postsecondary awards in CIP 52.1201 that were granted by institutions located in California in the 2021 academic year.

Schools	Certs & 2yr Awards ¹	4yr Awards ²	Post-Grad Awards ³	Avg Net Price ⁴
Ashford University		119	91	\$23,585
National University		41	18	\$9,966
Santa Clara University		39		\$48,469
University of La Verne			38	\$22,538
Los Angeles Pacific University		14		\$20,487
DeVry University-California			7	\$32,029
University of Phoenix-California			4	\$15,400
Pacific Union College		1		\$22,767
Point Loma Nazarene University		1		\$34,851
Total	0	215	158	

1. Undergraduate certificates and associate's degrees

2. Bachelor's degrees and post-baccalaureates

3. Master's, post-master's, and doctorates

4. Average net price represents full-time beginning undergraduate students who paid the in-state or in-district tuition rate and were awarded grant or scholarship aid from federal, state or local governments, or the institution. Data as of the 2020-2021 academic year.

Awards data are per the National Center for Education Statistics (NCES) and JobsEQ for the 2021 academic year. Any programs shown here reflect only data reported to the NCES; reporting is required of all schools participating in any federal finance assistance program authorized by Title IV of the Higher Education Act of 1965, as amended—other training providers in the region that do not report data to the NCES are not reflected in the above.

Occupation Crosswalk

The below table lists all occupations linked with the program, Management Information Systems, General, CIP 52.1201.

		Education and Training Requirements			Educational Attainment				
		Typical Education Needed for Entry	Work Experience in a Related Occupation	Typical On-the-Job Training Needed to Attain Competency in the Occupation	No College	Some College, No Degree	Associate's Degree	Bachelor's Degree	Postgraduate Degree
11-3021	Computer and Information Systems Managers	Bachelor's degree	5 years or more	None	2%	6%	5%	49%	37%
15-1243	Database Architects	Bachelor's degree	Less than 5 years	None	3%	6%	5%	49%	37%
15-1251	Computer Programmers	Bachelor's degree	None	None	3%	6%	5%	55%	31%
25-1021	Computer Science Teachers, Postsecondary	Doctoral or professional degree	None	None	1%	1%	1%	14%	82%

Education and training requirements are from the Bureau of Labor Statistics (BLS); educational attainment mix are regional data modeled by Chmura using Census educational attainment data projected to 2022Q4 along with source data from the BLS

Definition of Computer and Information Systems Managers (11-3021)

Plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming.

Definition of Database Architects (15-1243)

Design strategies for enterprise databases, data warehouse systems, and multidimensional networks. Set standards for database operations, programming, query processes, and security. Model, design, and construct large relational databases or data warehouses. Create and optimize data models for warehouse infrastructure and workflow. Integrate new systems with existing warehouse structure and refine system performance and functionality.

Definition of Computer Programmers (15-1251)

Create, modify, and test the code and scripts that allow computer applications to run. Work from specifications drawn up by software and web developers or other individuals. May develop and write computer programs to store, locate, and retrieve specific documents, data, and information.

Definition of Computer Science Teachers, Postsecondary (25-1021)

Teach courses in computer science. May specialize in a field of computer science, such as the design and function of computers or operations and research analysis. Includes both teachers primarily engaged in teaching and those who do a combination of teaching and research.

Occupation Details

As of 2022Q4, total employment for occupations linked to Management Information Systems, General in California was 131,680. Over the past three years, linked occupations shed 4,193 jobs in the region and are expected to need in aggregate approximately 72,934 newly trained workers over the next seven years.

Snapshot of Occupations Linked to Management Information Systems, General in California¹

SOC	Occupation	Current					3-Year History		7-Year Forecast				
		Empl	Mean Ann Wages ²	LQ	Unempl	Unempl Rate	Online Job Ads ³	Ann %	Total Demand	Exits	Transfers	Empl Growth	Avg Ann Growth %
11- 3021	Computer and Information Systems Managers	94,819	\$199,800	1.48	1,272	1.4%	9,478	2.8%	56,649	12,418	37,945	6,285	0.9%
15- 1251	Computer Programmers	25,311	\$124,600	1.25	408	1.7%	160	-14.1%	9,592	4,035	7,565	-2,008	-1.2%
15- 1243	Database Architects	9,451	\$142,100	1.19	271	3.0%	341	14.0%	5,364	1,658	3,040	666	1.0%
25- 1021	Computer Science Teachers, Postsecondary	2,099	\$148,200	0.46	41	2.0%	633	-1.2%	1,329	677	571	81	0.5%
Total - Linked Occupations		131,680	\$180,400	1.36	1,992	1.6%	10,612	-1.0%	72,934	18,788	49,121	5,025	0.5%
Total - All Occupations		19,219,968	\$71,900	1.00	797,161	4.1%	549,411	0.6%	17,029,863	6,722,656	9,379,252	927,955	0.7%

Source: [JobsEQ®](#)

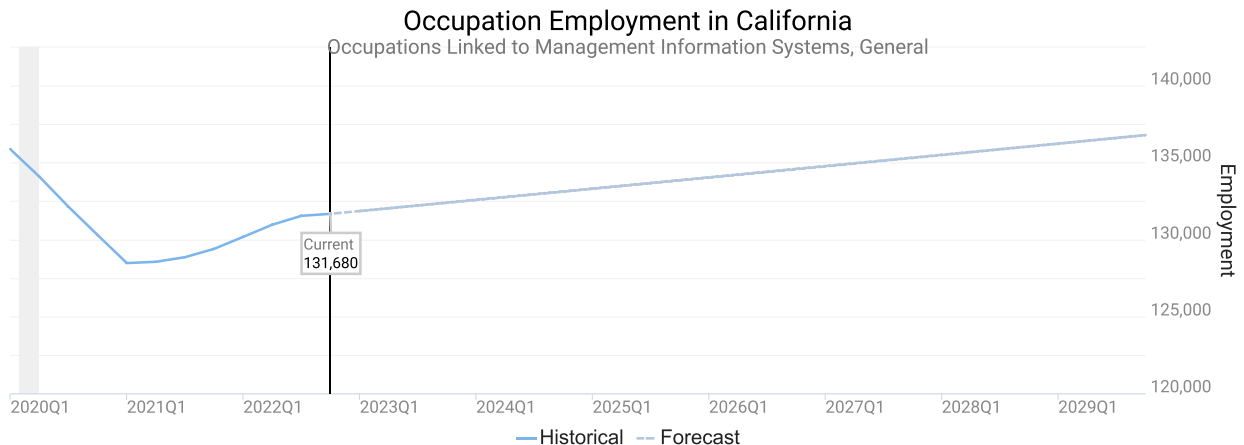
Data as of 2022Q4 unless noted otherwise

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. 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). Ad counts for ZCTA-based regions are estimates.



Source: JobsEQ®, Data as of 2022Q4. The shaded areas of the graph represent national recessions.

Occupation employment data are estimated via industry employment data and the industry/occupation mix. Industry employment data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and currently updated through 2022Q3, imputed where necessary with preliminary estimates updated to 2022Q4. Forecast employment growth uses national projections from the Bureau of Labor Statistics adapted for regional growth patterns. Occupation unemployment figures are imputed by Chmura.

Employment by Industry

The table illustrates the industries in California which most employ occupations linked to Management Information Systems, General. The single industry most employing these occupations in the region is Computer Systems Design and Related Services, NAICS 5415. This industry employs 34,109 workers in the linked occupations—employment which is expected to increase by 3,581 jobs over the next ten years; furthermore, 25,568 additional new workers in these linked occupations will be needed for this industry due to separation demand, that is, to replace workers in this occupation and industry that retire or move into a different occupation.

Industry Distribution for Occupations Linked to Management Information Systems, General in California

NAICS Code	Industry Title	Current			10-Year Demand		
		% of Occ Empl	Empl	Exits	Transfers	Empl Growth	Total Demand
5415	Computer Systems Design and Related Services	25.9%	34,109	7,106	18,461	3,581	29,148
5132	Software Publishers	6.8%	9,015	1,746	4,691	-63	6,374
5511	Management of Companies and Enterprises	5.5%	7,232	1,359	3,869	51	5,279
5417	Scientific Research and Development Services	5.5%	7,182	1,467	3,701	150	5,318
5416	Management, Scientific, and Technical Consulting Services	4.5%	5,901	1,199	3,199	522	4,920
5182	Computing Infrastructure Providers, Data Processing, Web Hosting, and Related Services	4.0%	5,264	1,085	2,924	703	4,711
5192	Web Search Portals, Libraries, Archives, and Other Information Services	3.7%	4,935	1,037	2,889	1,130	5,056
6113	Colleges, Universities, and Professional Schools	3.3%	4,312	1,239	2,055	138	3,432
5162	Media Streaming Distribution Services, Social Networks, and Other Media Networks and Content Providers	2.3%	3,038	586	1,643	128	2,357
3341	Computer and Peripheral Equipment Manufacturing	1.7%	2,287	430	1,224	12	1,665
5241	Insurance Carriers	1.7%	2,207	434	1,189	117	1,740
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	1.6%	2,135	395	1,106	-99	1,402
5611	Office Administrative Services	1.3%	1,710	362	914	185	1,461
5613	Employment Services	1.3%	1,680	353	832	-1	1,183
5121	Motion Picture and Video Industries	1.2%	1,612	321	913	209	1,443
5413	Architectural, Engineering, and Related Services	1.2%	1,585	295	831	-42	1,084
5419	Other Professional, Scientific, and Technical Services	1.2%	1,580	333	801	55	1,189
3344	Semiconductor and Other Electronic Component Manufacturing	1.1%	1,501	295	756	-56	995
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	1.1%	1,473	290	781	48	1,119
5221	Depository Credit Intermediation	1.1%	1,469	287	795	78	1,160
	All Others	23.9%	31,454	6,223	16,608	522	23,354

Source: JobsEQ®

Data as of 2022Q4 except wages which are as of 2021. Note that occupation-by-industry wages represent adjusted national data and may not be consistent with regional, all-industry occupation wages shown elsewhere in JobsEQ.

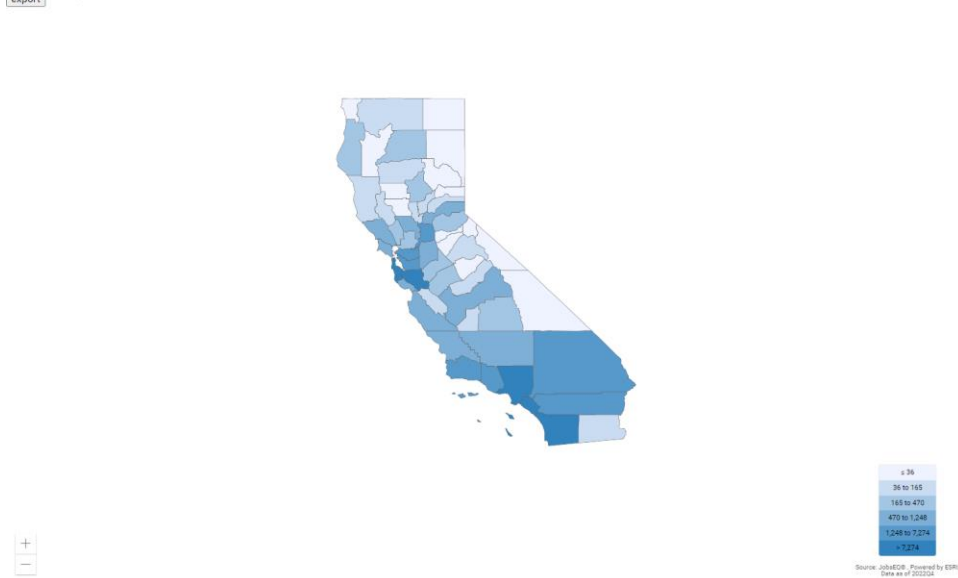
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Geographic Distribution

The map below illustrates the county-level distribution of employed workers in California in occupations linked to Management Information Systems, General. Employment is shown by place of work.

California, Occupation Concentration by Place of Work for Occupations Linked to Management Information Systems, General



Top Counties with Employment Linked to Management Information Systems, General, 2022Q4

Region	Employment
Los Angeles County, California	26,052
Santa Clara County, California	22,080
San Francisco County, California	14,508
San Diego County, California	11,247
Orange County, California	10,997
San Mateo County, California	7,275
Alameda County, California	6,910
Sacramento County, California	3,992
San Bernardino County, California	2,754
Riverside County, California	2,212

Source: JobsEQ®

Occupation employment data are estimated via industry employment data and the industry/occupation mix. Industry employment data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and currently updated through 2022Q3, imputed where necessary with preliminary estimates updated to 2022Q4.

Demographic Profile

The population in California was 39,346,023 per American Community Survey data for 2016-2020.

Of individuals 25 to 64 in California, 35.4% have a bachelor's degree or higher which compares with 34.3% in the nation. Per American Community Survey 2016-2020 estimates, the region has about 576,714 students enrolled in grade 12.

Summary¹

	Percent		Value	
	California	USA	California	USA
Demographics				
Population (ACS)	—	—	39,346,023	326,569,308
Male	49.7%	49.2%	19,562,882	160,818,530
Female	50.3%	50.8%	19,783,141	165,750,778
Median Age ²	—	—	36.7	38.2
Under 18 Years	22.8%	22.4%	8,956,641	73,296,738
18 to 24 Years	9.5%	9.3%	3,724,239	30,435,736
25 to 34 Years	15.3%	13.9%	6,007,913	45,485,165
35 to 44 Years	13.3%	12.7%	5,233,903	41,346,677
45 to 54 Years	12.8%	12.7%	5,039,155	41,540,736
55 to 64 Years	12.0%	12.9%	4,739,675	42,101,439
65 to 74 Years	8.3%	9.4%	3,270,380	30,547,950
Population Growth				
Population (Pop Estimates) ⁴	—	—	39,029,342	333,287,557
Population Annual Average Growth ⁴	0.3%	0.6%	108,479	1,940,990
People per Square Mile	—	—	250.4	94.3
Educational Attainment, Age 25-64				
No High School Diploma	15.2%	10.5%	3,199,850	17,929,220
High School Graduate	20.4%	25.4%	4,282,776	43,289,555
Some College, No Degree	21.0%	20.5%	4,412,172	34,959,338
Associate's Degree	8.0%	9.3%	1,678,082	15,776,790
Bachelor's Degree	22.6%	21.6%	4,741,354	36,888,244
Postgraduate Degree	12.9%	12.7%	2,706,412	21,630,870
Social				
Poverty Level (of all people)	12.6%	12.8%	4,853,434	40,910,326
Households Receiving Food Stamps/SNAP	9.0%	11.4%	1,183,873	13,892,407
Enrolled in Grade 12 (% of total population)	1.5%	1.3%	576,714	4,358,865
Disconnected Youth ³	1.9%	2.5%	38,451	433,164
Children in Single Parent Families (% of all children)	32.8%	34.0%	2,796,858	23,628,508
Uninsured	7.2%	8.7%	2,806,173	28,058,903
Speak English Less Than Very Well (population 5 yrs and over)	17.4%	8.2%	6,432,102	25,312,024

Source: [JobsEQ®](https://www.chmuraecon.com/jobseq)

1. American Community Survey 2016-2020, unless noted otherwise

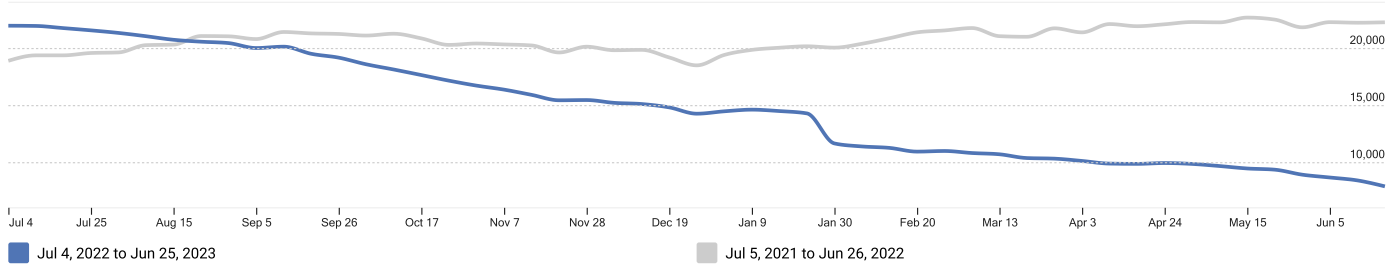
2. Median values for certain aggregate regions (such as MSAs) may be estimated as the weighted averages of the median values from the composing counties.

3. Disconnected Youth are 16-19 year olds who are (1) not in school, (2) not high school graduates, and (3) either unemployed or not in the labor force.

4. Census Population Estimate for 2022, annual average growth rate since 2012. Post-2019 data for Connecticut counties are imputed by Chmura.

RTI (Job Postings)

Active Job Ads by Date



Occupations

SOC	Occupation	Active Job Ads
11- 3021.00	Computer and Information Systems Managers	75,432
25- 1021.00	Computer Science Teachers, Postsecondary	1,913
15- 1243.00	Database Architects	1,049
15- 1251.00	Computer Programmers	750
15- 1243.01	Data Warehousing Specialists	669

Locations

Location	Active Job Ads
San Francisco, California	8,269
Los Angeles, California	4,386
San Jose, California	4,061
San Diego, California	3,155
Santa Clara, California	2,018
Sunnyvale, California	1,977
Irvine, California	1,929
Palo Alto, California	1,258
Sacramento, California	1,208
Mountain View, California	1,120

Employers

Employer Name	Active Job Ads	
Cynet Systems	2,591	
Google	1,406	
Apple	1,402	
Meta	1,381	
Motion Recruitment	1,330	
Deloitte	1,310	
Boeing	973	
Amazon.com Services LLC	962	
Diverse Lynx	898	
Jobot	572	

Certifications

Certificate Name	Active Job Ads	
Project Management Professional (PMP)	2,005	
Certified Information Systems Security Professional (CISSP)	1,685	
Secret Clearance	1,298	
Certified Information Systems Auditor (CISA)	958	
Certified Information Security Manager (CISM)	820	
Certified Public Accountant (CPA)	637	
Driver's License	420	
Certified Internal Auditor (CIA)	341	
Certified ScrumMaster (CSM)	328	
Certification in Risk and Information Systems Control (CRISC)	317	

Hard Skills

Skill Name	Active Job Ads	
Agile	13,420	
Python	12,271	
Structured Query Language (SQL)	11,121	
Amazon Web Services (AWS)	9,890	
Microsoft Excel	7,553	
Java	7,494	
Microsoft Azure	7,115	
Presentation	6,130	
JavaScript	5,785	
Change Management	5,288	

Soft Skills

Skill Name	Active Job Ads	
Communication (Verbal and written skills)	52,449	
Cooperative/Team Player	44,716	
Supervision/Management	26,835	
Project Management	19,106	
Problem Solving	18,492	
Analytical	17,537	
Prioritize	14,221	
Leadership	14,050	
Interpersonal Relationships/Maintain Relationships	11,700	
Self-Motivated/Ability to Work Independently/Self Leadership	11,287	

Job Titles

Job Title	Active Job Ads	
Program Manager	494	
Data Engineer	486	
Senior Data Engineer	325	
Product Manager	303	
Business Development Manager	212	
Remote - Cloud Database Architect	212	
IT Manager	197	
INFORMATION TECHNOLOGY ASSOCIATE	193	
Senior Product Manager	191	
Senior Program Manager	174	

Job Types

Type	Active Job Ads	
Full-Time	36,817	
Remote	12,627	
Permanent	7,213	
Temporary (unspecified)	5,933	
Temporary (long-term)	1,055	
Part-Time	889	
Temporary (short-term)	497	
Temp-to-Hire	292	
Remote Not Indicated	67,186	

Programs

Program Name	Active Job Ads	
Computer Science	17,826	
Engineering	9,417	
Business Administration	5,984	
Business	4,579	
Technical	3,219	
Mathematics	3,173	
Information Systems	2,720	
Computer Engineering	2,469	
Information Technology	2,388	
Electrical Engineering	1,997	

Education Levels

Minimum Education Level	Active Job Ads	
Bachelor's degree	42,692	
Master's degree	4,021	
High school diploma or equivalent	1,574	
Associate's degree	1,219	
Doctoral or professional degree	834	
Unspecified/other	29,473	

California Regional Map



FAQ

What is CIP?

The 2010 Classification of Instructional Programs (CIP) is taxonomy of instructional program classifications and descriptions. It was developed and has been updated by the U.S. Department of Education's National Center for Education Statistics (NCES).

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 is the source of the job ads?

Job ads data are online job posts from the Real-Time Intelligence (RTI) data set, produced wholly by Chmura and gleaned from over 40,000 websites. Data reflect ads active during the last twelve month period ending 06/29/2023 and advertised for any Zip Code Tabulation Area in or intersecting with the region for which this report was produced. Historical ad volume is revised as additional data are made available and processed. Since many extraneous factors can affect short-term volume of online job postings, time-series data can be volatile and should be used with caution. All ad counts represent deduplicated figures.

What is the program-to-occupation crosswalk?

Training programs are classified according to the Classification of Instructional Programs (CIP codes). For relating training programs, this report uses a modified version of the CIP to SOC crosswalk from the National Center for Education Statistics (NCES). While this is a very helpful crosswalk for estimating occupation production from training program awards data, the crosswalk is neither perfect nor comprehensive. Indeed, it is hard to imagine such a crosswalk being perfect since many training program graduates for one reason or another do not end up employed in occupations that are most related to the training program from which they graduated. Therefore, the education program analyses should be considered in this light.

As an example of the many scenarios that may unfold, consider a journalism degree that crosswalks into three occupations: editors, writers, and postsecondary communications teachers. Graduates with a journalism degree may get a job in one of these occupations—and that may be the most-likely scenario—but a good number of these graduates may get a job in a different occupation altogether (the job may be somewhat related, such as a reporter, or the job may be totally unrelated, such as a real estate agent). Furthermore, a graduate may stay in school or go back to school for a degree that will lead to other occupation possibilities. Still another possibility includes the graduate not entering the labor market (maybe being unemployed, being a non-participant, or moving to another region).

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 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 occupation (or industry) 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 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.

About This Report

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