

March 2022

Labor Market Analysis

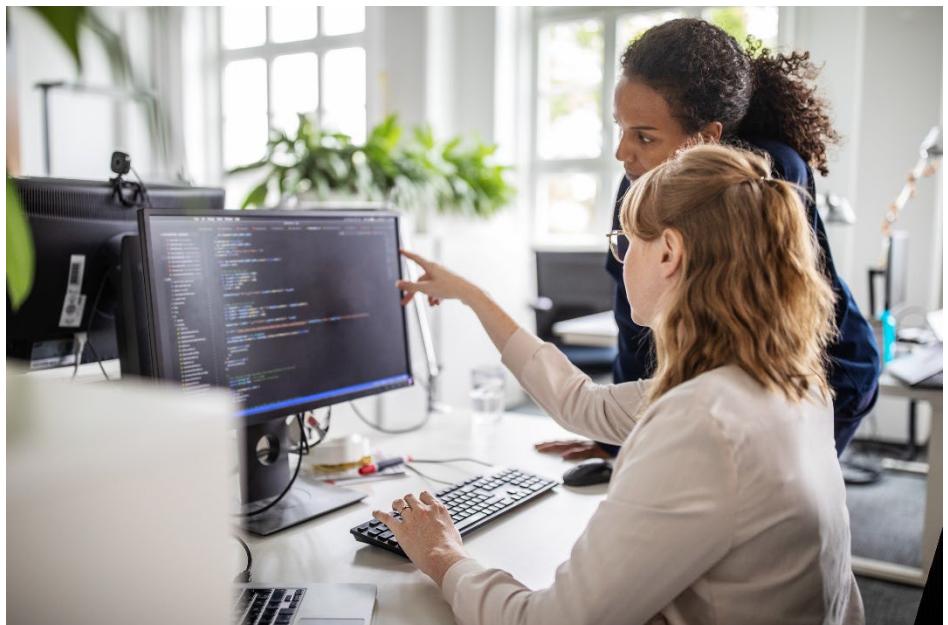
Information Systems, Web Development and Design



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Prepared by the Central Valley/Mother Lode Center of Excellence

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COVID-19 Statement: This report includes employment projection data by Emsi. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy during the projection period will be at approximately full employment or potential output. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, they may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Other measures such as unemployment rates and monthly industry employment estimates will reflect the most recent information on employment and jobs in the state and, in combination with input from local employers, may help validate current and future employment needs as depicted here.

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Summary

Please note the COVID-19 statement on page 2 when considering this report's findings.

This study conducted by the Central Valley/Mother Lode Center of Excellence examines labor market demand, wages, skills, and postsecondary supply for information systems, web development and design. Two occupations related to information systems, web development and design were identified for Reedley College:

- 15-1231, Computer Network Support Specialists
- 15-1257, Web Developers and Digital Interface Designers

Key findings:

- **Occupational demand** — There were 1,070 workers were employed in jobs related to information systems, web development and design in 2020 in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. The largest occupation is computer network support specialists with 610 workers, a projected growth rate of 2% over the next five years, and 48 annual openings.
- **Wages** — Computer network support specialists earn the highest entry-level wage, \$26.63/hour in the subregion.
- **Employers** — Employers with the most job postings in the subregion are Anthem Blue Cross, Deloitte, and Graphic Packaging International.
- **Occupational titles** — The most common occupational title and job title in the subregion in job postings is Web Developers.
- **Skills and certifications** — The top baseline skill is communication skills, the top specialized skill is JavaScript, and the top software skill is JavaScript. The most in-demand certification is a driver's license.
- **Education** — An associate's degree is typically required for the two occupations.
- **Supply** — Analysis of postsecondary completions shows that on average 16 awards were conferred in the Central Valley/Mother Lode region each year.

Based on a comparison of occupational demand and supply, there is an undersupply of 85 trained workers in the subregion and 131 workers in the region. The Center of Excellence recommends that Reedley College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of information systems, web development and design workers in the region.

Introduction

The Central Valley/Mother Lode Center of Excellence was asked by Reedley College to provide labor market information for information systems, web development and design. The geographical focus for this report is the South Central Valley/Southern Mother Lode (SCV/SML) subregion, but regional demand and supply data has been included for broader applicability and use. The average living wage for a single adult in the SCV/SML subregion is \$11.91/hour.¹ Analysis of the program and occupational data related to information systems, web development and design resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 15-1231, Computer Network Support Specialists
- 15-1257, Web Developers and Digital Interface Designers

The occupational titles, job descriptions, sample job titles, and knowledge and skills from the Bureau of Labor Statistics and O*NET OnLine are shown below. There was no O*NET data available for Web Developers and Digital Interface Designers

Computer Network Support Specialists

Job Description: Analyze, test, troubleshoot, and evaluate existing network systems, such as local area networks (LAN), wide area networks (WAN), cloud networks, servers, and other data communications networks. Perform network maintenance to ensure networks operate correctly with minimal interruption.

Knowledge: Computers and Electronics, Telecommunications, Customer and Personal Service, Engineering and Technology, English Language

Skills: Critical Thinking, Active Listening, Judgment and Decision Making, Reading Comprehension, Active Learning

Occupational Demand

The SCV/SML subregion employed 1,070 workers in information systems, web development and design occupations in 2020 (Exhibit 1). The largest occupation is computer network support specialists with 610 workers. This occupation is projected to grow by 2% over the next five years and has the greatest number of projected annual openings, 48.

Exhibit 1. Information systems, web development and design employment and occupational projections in the SCV/SML subregion

Occupation	2020 Jobs	2025 Jobs	5-Year Change	5-Year % Change	Annual Openings
Computer Network Support Specialists	610	619	9	2%	48
Web Developers and Digital Interface Designers	460	503	43	9%	44
TOTAL	1,070	1,122	52	5%	92

¹ The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: <https://insightcced.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

Wages

Exhibit 2 shows the entry-level hourly wages of the information systems, web development and design occupations. Computer network support specialists earn the highest entry-level wage, \$26.63/hour in the subregion².

Exhibit 2. Information systems, web development and design entry-level wages in the SCV/SML subregion



Job Postings

There were 312 job postings for the two occupations in the SCV/SML subregion from September 2021 to February 2022.³ The employers with the most job postings are listed in Exhibit 3.

Exhibit 3. Top employers of information systems, web development and design by number of job postings

Employer	Job Postings	% Job Postings
Anthem Blue Cross	26	12%
Deloitte	11	5%
Graphic Packaging International	11	5%
Danaher Corporation	9	4%
Array	8	4%
Metasys Technologies	8	4%
Kern Community College District	6	3%
Raytheon	6	3%
Lee Enterprises	5	2%
Left Field Labs	5	2%

Exhibit 4 shows how job postings for the targeted occupations in the SCV/SML subregion are distributed across two O*NET OnLine occupations. The occupational title Web Developers is listed in 240 job postings. Note how this occupational title dominates the job posting results. Common job titles in postings include

² Entry-level wages are derived from the 25th percentile.

³ Other than occupation titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

Web Developer in 12 job postings, Angular Front End Developer in 11 job postings, and Front End Developer Entry Level in 10 job postings.

Exhibit 4. Top occupational titles in job postings for information systems, web development and design

Occupational Title	Job Postings	% of Job Postings
Web Developers	240	77%
Computer Network Support Specialists	72	23%

Salaries

Exhibit 5 shows the “Market Salaries” for information systems, web development and design occupations. These are calculated by Burning Glass using a machine learning model built off of millions of job postings every year. This accounts for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

Exhibit 5. Salaries for information systems, web development and design occupations

Market Salary Percentile	Salary Amount
10th Percentile	\$43,668
25th Percentile	\$57,726
50th Percentile	\$77,645
75th Percentile	\$95,554
90th Percentile	\$112,506

Education

Of the 312 job postings, 173 listed an education level preferred for the positions being filled. Among those, 90% a bachelor's degree, 17% requested high school or vocational training, and 12% requested a master's degree (Exhibit 6). A job posting can indicate more than one education level. Hence, the percentages shown in the chart below may total more than 100%.

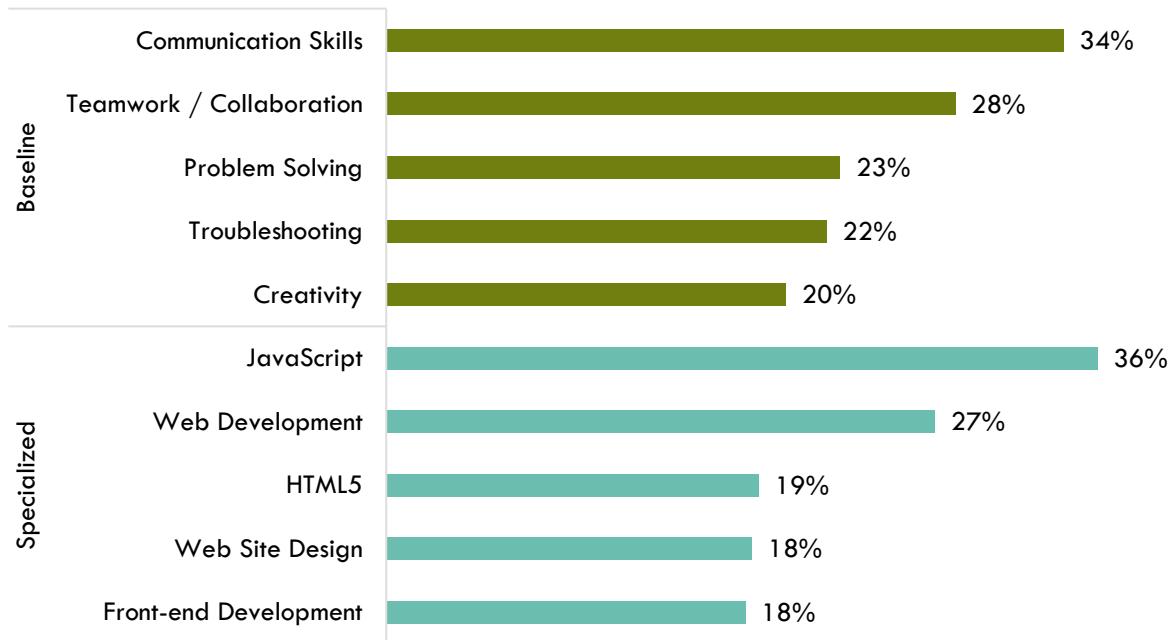
Exhibit 6. Education levels requested in job postings for information systems, web development and design

Education Level	Job Postings	% of Job Postings
Bachelor's degree	156	90%
High school or vocational training	29	17%
Master's degree	20	12%
Associate's degree	10	6%
Doctoral degree	5	3%

Baseline and Specialized Skills

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are communication skills, 34% of job postings, teamwork/ collaboration, 28%, and problem solving, 23%. The top three specialized skills are JavaScript, 36% of job postings, web development, 27%, and HTML5, 19%.

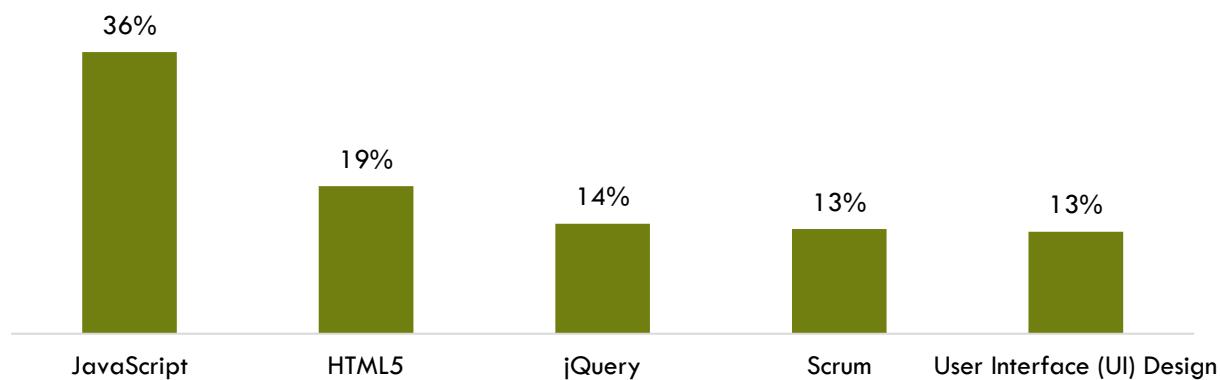
Exhibit 7. In-demand information systems, web development and design baseline and specialized skills



Software Skills

Analysis also included the software skills most in demand by employers. JavaScript and HTML5 were the top two software skills identified in job postings (Exhibit 8).

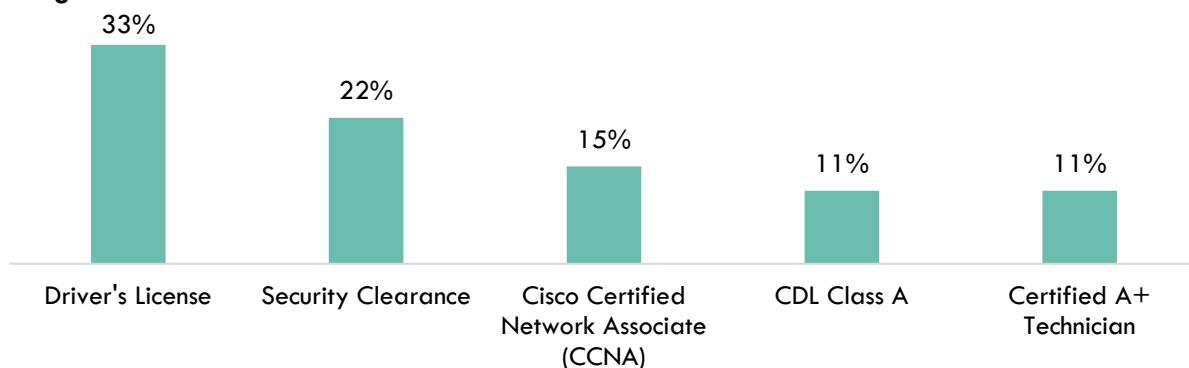
Exhibit 8. In-demand information systems, web development and design software skills



Certifications

Of the 312 job postings, 27 contained certification data. Among those, 33% indicated a need for a driver's license. The next top certifications are security clearance and cisco certified network associate (CCNA) (Exhibit 9). (Due to the low number of job postings with certifications listed, the chart below may not be representative of the full sample.)

Exhibit 9. Top information systems, web development and design certifications requested in job postings



Education, Work Experience & Training

An associate's degree is typically required for the two occupations (Exhibit 10).

Exhibit 10. Education, work experience, training, and Current Population Survey results for information systems, web development and design occupations⁴

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Computer Network Support Specialists	Associate's degree	None	None	39.2%
Web Developers and Digital Interface Designers	Associate's degree	None	None	23.4%

⁴ "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.

Supply

Analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) included the TOP code and title: 070710 - Computer Programming. Analysis of the last three years of data shows that, on average, 16 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

Exhibit 11. Postsecondary supply for information systems, web development and design occupations in the region

TOP/CIP Code-Title	College	Associate Degree	Certificate 12 < 18 Semester Units	Certificate 16 < 30 Semester Units	Certificate 18 < 30 Semester Units	Certificate 30 < 60 Semester Units	Certificate 8 < 16 Semester Units	Subtotal
070710 - Computer Programming	Columbia	1						1
	Modesto		7				0	8
	Reedley College	1		4	0			5
	San Joaquin Delta				0	0		1
	West Hills Lemoore				2			2
TOTAL		2	7	4	3	0	0	16

There is an undersupply of 85 information systems, web development and design workers in the SCV/SML subregion and 131 workers in the region (Exhibit 12).

Exhibit 12. Information systems, web development and design workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill gap in the SCV/SML subregion and region



Student Outcomes

Exhibit 13 summarizes employment and wage outcomes from the California Community College Chancellor's Cal-PASS Plus LaunchBoard for the TOP code related to information systems, web development and design. Of note, 83 students transferred; 67% of students obtained a job closely related to their field of study; 32% had a median change in earnings; and 56% of students attained a living wage.

Exhibit 13. Subregional metrics for the TOP code related to information systems, web development and design

Metric	Computer Programming 070710
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	*
Number of Students Who Transferred	83
Job Closely Related to Field of Study	67%
Median Change in Earnings	32%
Attained a Living Wage	56%

* denotes data not available.

Conclusion

The entry-level wages of the two occupations exceed the SCV/SML subregion's average living wage. There were 312 job postings in the past six months for occupations related to information systems, web development and design in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is Communication Skills, and the top specialized skill is JavaScript.
- The top software skill is JavaScript.
- The top certification is a driver's license.

There is an undersupply of trained workers, a shortage of 85 in the SCV/SML subregion and 131 in the region.

Recommendation

Based on these findings, it is recommended that Reedley College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of information systems, web development and design workers in the region.

Appendix A: Methodology & Data Sources

Data Sources

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor's Office Management Information Systems Data Mart and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (EMSI). 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). Occupational wage estimates also affected by county-level EMSI earnings by industry: economicmodeling.com .
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: https://www.bls.gov/emp/tables/educational-attainment.htm .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov .
Job Posting and Skills Data	Burning Glass: burning-glass.com/ .
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: onetonline.org .

Key Terms and Concepts

Annual Job Openings: Annual openings are calculated by dividing the number of years in the projection period by total job openings.

Education Attainment Level: The highest education attainment level of workers age 25 years or older.

Employment Estimate: The total number of workers currently employed.

Employment Projections: Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (EMSI) formula that includes historical employment and economic indicators along with national, state and local trends.

Living Wage: The cost of living in a specific community or region for one adult and no children. The cost increases with the addition of children.

Occupation: An occupation is a grouping of job titles that have a similar set of activities or tasks that employees perform.

Percent Change: Rate of growth or decline in the occupation for the projected period; this does not factor in replacement openings.

Replacements: Estimate of job openings resulting from workers retiring or otherwise permanently leaving an occupation. Workers entering an occupation often need training. These replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for an occupation.

Total Job Openings (New + Replacements): Sum of projected growth (new jobs) and replacement needs. When an occupation is expected to lose jobs, or retain the current employment level, number of openings will equal replacements.

Typical Education Requirement: represents the typical education level most workers need to enter an occupation.

Typical On-The-Job Training: indicates the typical on-the-job training needed to attain competency in the skills needed in the occupation.