

Program Endorsement Brief: 0707.00 - Computer Software Development *Blockchain Developer*

Los Angeles/Orange County Center of Excellence, April 2021

Summary Analysis

Program Endorsement:	Endorsed: All Criteria Met <input type="checkbox"/>	Endorsed: Some Criteria Met <input checked="" type="checkbox"/>	Not Endorsed <input type="checkbox"/>
Program Endorsement Criteria			
Supply Gap:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/> <i>(see comments below)</i>	
Living Wage: (Entry-Level, 25th)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Education:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Emerging Occupation(s)			
Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>	

The Los Angeles/Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide Los Angeles/Orange County regional labor market supply and demand data related to the middle-skill occupation that is most closely aligned with the emerging field of blockchain – which is *web developers and digital interface designers (15-1257)*. Middle-skill occupations typically require some postsecondary education, but less than a bachelor’s degree.¹ This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupation.

While *software developers and software quality assurance analysts and testers (15-1256)* was the best-fit occupation, it was not included in this report because not only does it typically require a bachelor’s degree, but further, only **14% of incumbent workers have an associate degree or less.**

Based on the available data, there does not appear to be a supply gap for *web developers and digital interface designers* in the region. However, the oversupply is due to the inclusion of various IT programs that have historically trained for the occupation of interest as well as many others, but this report focuses on only a single occupation. This occupation typically requires an associate degree, and entry-level wages exceed the living wage in both Los Angeles and Orange counties. **Therefore, due to some of the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

¹ The COE classifies middle-skill jobs as the following:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor’s degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

Demand:

- **Supply Gap Criteria** – Over the next five years, there is projected to be **718 jobs available annually** in the region due to new job growth and replacements, **which is less than the 947 awards conferred annually** by educational institutions in the region.
- **Living Wage Criteria** – Entry-level *web developers and digital interface designers* typically earn between \$21 and \$23 per hour, which are above the Los Angeles and Orange County living wage.²
- **Employer Job Postings** – Over the past 12 months, there have been 506 online job postings with the keywords “blockchain” or “bitcoin” in the job description.
- **Educational Criteria** – The Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for *web developers and digital interface designers*.
 - National-level educational attainment data indicates **23.4% of workers in the field have completed some college or an associate degree.**

Supply:

- There are **23 community colleges** in the LA/OC region that issue awards related to *web developers and digital interface designers*, conferring an average of **503 awards annually** between 2017 and 2020.
- Between 2014 and 2017, there was an average of **444 awards conferred annually** in related training programs by non-community college institutions.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for *web developers and digital interface designers* (15-1257). In Los Angeles/Orange County, the number of jobs related to this occupation is projected to increase by 4% through 2024. There will be nearly 720 job openings per year through 2024 due to job growth and replacements.

This report includes employment projection data by Emsi, which uses EDD information. 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. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, it 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. Therefore, the projections included in this report do not take the impacts of COVID-19 into account.

² Living wage data was pulled from California Family Needs Calculator on 4/14/2021. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties³

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	6,700	6,999	299	4%	520
Orange	2,602	2,693	91	3%	199
Total	9,302	9,693	391	4%	718

Wages

The labor market endorsement in this report considers the entry-level hourly wage for *web developers and digital interface designers* in Los Angeles County, as it relates to the county's living wage. Orange County wages are included below in order to provide a complete analysis of the LA/OC region. Detailed wage information, by county, is included in Appendix A.

Los Angeles County: The typical entry-level hourly wage for *web developers and digital interface designers* is \$22.53, which is above the living wage for one adult (\$15.04 in Los Angeles County). Experienced workers can expect to earn \$47.16, which is higher than the living wage estimate.

Orange County: The typical entry-level hourly wage for *web developers and digital interface designers* is \$21.26, which is above the living wage for one adult (\$17.36 in Orange County). Experienced workers can expect to earn \$44.79, which is higher than the living wage estimate.

Job Postings

In order to quantify blockchain-related jobs in Los Angeles/Orange County, several filters were applied in Burning Glass, a software platform that provides real-time labor market information by scouring the web for job postings. Over the past 12 months, there have been 506 online job postings with the keywords "blockchain" or "bitcoin" in the job description. Only job postings listing a high school or vocational training, associate degree, or bachelor's degree were considered. The highest number of job postings were linked to software developers, applications; computer occupations, all other; and web developers. The top skills were blockchain, Internet of Things (IoT), business development, and python. The top employers, by number of job postings, in the region were IBM, Accenture, and Deloitte.

It is important to note that the job postings data included in this section reflects online job postings listed in the past 12 months and does not yet demonstrate the impact of COVID-19. While employers have generally posted fewer online job postings since the beginning of the pandemic, the long-term effects are currently unknown.

Educational Attainment

The Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for *web developers and digital interface designers*. National-level educational attainment data indicates 23.4% of workers in the field have completed some college or an associate degree. Of the job postings listing a minimum education requirement in Los Angeles/Orange County, 6% (32)

³ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

requested high school or vocational training, 1% (4) requested an associate degree, and 93% (470) requested a bachelor's degree.

Educational Supply

Community College Supply — Exhibit 2 shows the annual and three-year average number of awards conferred by community colleges in programs that have historically trained for *web developers and digital interface designers*. The colleges with the most completions in the region are Mt. San Antonio, Orange Coast, and Santa Monica. Over the past 12 months, there have not been any blockchain program recommendation requests from regional community colleges.

Exhibit 2: Regional community college awards (certificates and degrees), 2017-2020

TOP	Program	College	2017-18 Awards	2018-19 Awards	2019-20 Awards	3-Yr Average
0614.30	Website Design and Development	LA Pierce	-	3	2	2
		Mt San Antonio	9	9	7	8
		Pasadena	-	-	1	0
		Santa Monica	-	-	2	1
		LA Subtotal	9	12	12	11
		Coastline	-	1	1	1
		Fullerton	-	3	-	1
		Irvine Valley	2	3	-	2
		Orange Coast	-	-	9	3
		Saddleback	4	7	2	4
		Santa Ana	1	-	2	1
		Santiago Canyon	9	24	3	12
		OC Subtotal	16	38	17	24
		Supply Subtotal/Average			25	50
0702.10	Software Applications	Cerritos	3	9	6	6
		LA City	-	-	1	0
		LA Mission	7	2	-	3
		LA Southwest	2	1	-	1
		Long Beach	-	-	7	2
		Mt San Antonio	3	1	2	2
		Santa Monica	10	18	13	14
		LA Subtotal	25	31	29	28
		Coastline	4	9	8	7
		Irvine Valley	22	39	48	36
		Saddleback	3	2	7	4
		OC Subtotal	29	50	63	47
		Supply Subtotal/Average			54	81
0707.00	Computer Software Development	LA City	-	1	-	0
		LA Subtotal	-	1	-	0
		Cypress	1	1	1	1

TOP	Program	College	2017-18 Awards	2018-19 Awards	2019-20 Awards	3-Yr Average
		Golden West	3	4	2	3
		Orange Coast	7	7	2	5
		Saddleback	3	13	3	6
		OC Subtotal	14	25	8	16
Supply Subtotal/Average			14	26	8	16
0707.10	Computer Programming	Cerritos	4	-	2	2
		Citrus	-	-	1	0
		East LA	6	8	4	6
		Glendale	2	2	3	2
		LA City	-	-	6	2
		LA Mission	5	6	4	5
		LA Pierce	9	18	4	10
		LA Southwest	1	-	1	1
		LA Valley	10	7	6	8
		Long Beach	2	4	5	4
		Mt San Antonio	62	119	114	98
		Pasadena	8	11	21	13
		Santa Monica	42	44	46	44
		West LA	-	1	-	0
		LA Subtotal	151	220	217	196
		Cypress	18	22	20	20
		Fullerton	-	16	28	15
		Irvine Valley	10	8	4	7
		Orange Coast	29	31	157	72
Santa Ana	1	13	1	5		
Santiago Canyon	30	9	3	14		
OC Subtotal	88	99	213	133		
Supply Subtotal/Average			239	319	430	329
0709.00	World Wide Web Administration	Glendale	9	6	7	7
		LA Pierce	5	9	-	5
		Long Beach	4	22	24	17
		West LA	24	13	9	15
		LA Subtotal	42	50	40	44
		Saddleback	-	-	2	1
OC Subtotal	-	-	2	1		
Supply Subtotal/Average			42	50	42	45
0709.10	E-Commerce (Technology emphasis)	East LA	-	1	1	1
		LA Subtotal	-	1	1	1
		Saddleback	-	6	1	2

TOP	Program	College	2017-18 Awards	2018-19 Awards	2019-20 Awards	3-Yr Average
		OC Subtotal	-	6	1	2
		Supply Subtotal/Average	-	7	2	3
		Supply Total/Average	374	533	603	503

Non-Community College Supply — It is important to consider the supply from non-community college institutions in the region that provide relevant training programs. Exhibit 3 shows the annual and three-year average number of awards conferred by institutions in related programs. Due to different data collection periods, the most recent three-year period of available data is from 2014 to 2017. Between 2014 and 2017, non-community college institutions in the region conferred an average of 444 awards annually in related training programs.

Exhibit 3: Regional non-community college awards, 2014-2017

CIP	Program	Institution	2014-15 Awards	2015-16 Awards	2016-17 Awards	3-Yr Average
11.0201	Computer Programming / Programmer, General	ABCO Technology	6	12	18	12
		ITT Technical Institute-San Dimas	5	0	0	2
		University of Phoenix-California	68	62	43	58
11.0801	Web Page, Digital / Multimedia and Information Resources Design	Advanced Computing Institute	73	46	57	59
		Argosy University-The Art Institute of California-Hollywood	22	20	24	22
		Argosy University-The Art Institute of California-Los Angeles	15	23	24	21
		Argosy University-The Art Institute of California-Orange County	19	15	33	22
		DeVry University-California	91	69	36	65
		Fremont College	8	1	0	3
		University of Phoenix-California	5	6	1	4

CIP	Program	Institution	2014-15 Awards	2015-16 Awards	2016-17 Awards	3-Yr Average
11.1003	Computer and Information Systems Security / Information Assurance	Azusa Pacific University	8	4	3	5
		ITT Technical Institute-Orange	37	0	0	12
		ITT Technical Institute-San Dimas	23	0	0	8
		ITT Technical Institute-Sylmar	19	0	0	6
		ITT Technical Institute-Torrance	6	0	0	2
		Learnet Academy Inc	0	39	48	29
		Mt Sierra College	14	9	8	10
		University of Phoenix-California	111	74	71	85
11.1004	Web / Multimedia Management and Webmaster	ABCO Technology	7	9	12	9
		Pepperdine University	0	1	0	0
		University of Phoenix-California	7	5	4	5
52.0208	E-Commerce / Electronic Commerce	University of La Verne	5	3	0	3
		University of Phoenix-California	1	1	0	1
		Grand Total	550	399	382	444

Appendix A: Occupational demand and wage data by county

Exhibit 4. Los Angeles County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Web Developers and Digital Interface Designers (15-1257)	6,700	6,999	299	4%	520	\$22.53	\$33.68	\$47.16
Total	6,700	6,999	299	4%	520			

Exhibit 5. Orange County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Web Developers and Digital Interface Designers (15-1257)	2,602	2,693	91	3%	199	\$21.26	\$31.88	\$44.79
Total	2,602	2,693	91	3%	199			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Typical Entry-Level Education
Web Developers and Digital Interface Designers (15-1257)	9,302	9,693	391	4%	718	Associate Degree
Total	9,302	9,693	391	4%	718	

Appendix B: Sources

- O*NET Online
- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (Emsi)
- Bureau of Labor Statistics (BLS)
- Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

For more information, please contact:

Luke Meyer, Director
Los Angeles/Orange County Center of Excellence
lmeyer7@mtsac.edu

April 2021

